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CHASING SHADOWS :

A LOOK AT THE TREATMENT OF LIGHT AND SHADE IN PAINTERS'
QUEST FOR SPATIAL REALISM IN 13TH AND 14TH CENTURY ITALY

VOLUME ONE OF THREE

by

JOHN BLACK

THESIS SUBMITTED FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF GLASGOW

DEPARTMENT OF HISTORY OF ART

SEPTEMBER 2001

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CHASING SHADOWS

A look at the treatment of light and shade in painters' quest for spatial realism in
13th and 14th century Italy

ABSTRACT

This is a study of Duecento and Trecento Italian painters' approach to light and shade in their attempts to create the illusion of depth in pictures.

Based on the examination of a large number of paintings it is an essentially technical consideration of the developments in the depiction of light's effects during this period of reviving interest in illusionistic painting. This, of necessity, must be from a 20th century perspective, and some virtue is deliberately made out of this anachronistic scrutiny. Care is taken to appreciate the concepts of the period through a study of its prevailing theories and practice, and to relate these to modern theories of light and perception.

At the same time the developments are also related to the historical traditions, antique and medieval, which had shaped art up until the Duecento. In this respect the invaluable contribution made by Byzantine art in providing continuity with the heritage of Graeco-Roman and Hellenistic painting becomes apparent.

The developments are looked at thematically with separate examination of the treatment of light in Faces, Garments and Fabrics, Architecture, Landscape, Night effects and Lit Interiors, and with, finally, a look at its absence in Shadows.

The closing decades of the Duecento and the opening ones of the Trecento prove the most fertile period for the renewed pursuit of naturalistic working and much of the study centres on them. Some consolidation of the re-established illusionistic techniques is noted in the first half of the 14th century but only isolated essays are noted in the latter half. Here the balance of interest is perceived to shift, and a painting's decorative effect rather than its powers of illusion are more valued. The new procedures and conventions established by the first decade are seen formally maintained, but only in localised realistic effects.

The signs of a return to a more active pursuit of overall composite lighting illusion are then examined in works of the first decades of the Quattrocento, when the advances of a century earlier are systematically taken up once more.

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- 108: *Christ in Majesty adored by Emperor Conrad and Empress Gisela*, manuscript, 1045-6, Speier Golden Gospels, MS. Vitr.17, fol.2 v., Escorial Library.
- 109: *God's Covenant with Noah*, from Octateuch, Ms.gr.747, folio 31 recto, c.1050-75, Rome, Vatican Library.
- 110: *Crucifixion*, from The Missal of St.Louis, folio 105 verso, 1255-56, Assisi, Museo-Tesoro della Basilica di S.Francesco.
- 111: Gerona Master, *Raising of the Cross*, from The Bologna University Psalter, Ms. 346 folio 12 recto, c.1260-80, Bologna, Biblioteca Universitaria.
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PREFACE

Perspective and its early history has been the subject of continuing scholarship for centuries. However, such work has concentrated on the geometry of linear perspective as a method of simulating depth in picture making. Much less attention has been paid to the part the recording of light and shade has played in any simulation of space or volume. The following study looks at how 13th and 14th century Italian artists approached the pictorial treatment of light and its effects, as they sought to introduce convincing spatial realism into their paintings. It follows their attempts to synthesise effective pictorial analogues of lighting phenomena in fashioning credible illusions. The procedures of earlier and antique painters is also considered, since the 13th and 14th century workers were rediscovering or reinventing skills many of which had already been developed in earlier times.

The study arose from an interest not just in paintings, but also in the mechanics of their creation and a sympathetic curiosity about the thoughts and problems of the artists who produced them. Its essentially technical approach is in many ways anachronistic, but by keeping this constantly in mind I endeavoured to make a virtue out of it, through consciously comparing and relating the modern and the medieval. I believe that, while cultural differences separate us from the Italian painters of the Duecento and Trecento, and can make any profound interpretation of their works problematic, there is sufficient common ground to allow fruitful approaches at a technical level. The physiology of visual perception has not changed in any significant way since the Duecento, nor since Classical times for that matter. Neither has the physics of the light which provides the stimulus for perception. Further, any common understandings, or for that matter any differences which seem readily explicable, at

this basic level, might be helpful in saving confusion, by detaching these from the body of imponderable questions at cultural levels. At the same time, the alternative avenue of approach readily results in alternative viewpoints, prompts some new questions, or at least adds fresh slants to older ones, and offers insights into some of the cultural conundrums.

The research for this study was made possible by the University of Glasgow William and Margaret Kesson Award, and was further assisted by Research Support Awards from the University of Glasgow. Additional generous grants from the Carnegie Trust for the Universities of Scotland subsidised study trips to Italy in 1996 and 1997. With such help I travelled to Venice, Treviso, Padua, Bologna, Pisa, Lucca, Florence, Siena, Arezzo, Assisi, Rome, and Naples. Typical of such trips, in Florence multiple visits were made to the Uffizi and other galleries, Accademia, Bargello etc., and to the important works in the churches of S.Maria Novella, S. Croce, the Duomo and Baptistry etc. In Britain many return visits were made to the London National Gallery, British Museum, the British Library, the Courtauld Gallery and the Cambridge Fitzwilliam. Further afield visits to Athens, Thessalonika, Vergina and Pella have allowed some access to ancient and Byzantine works. As a result most works, and certainly all the major paintings, involved in my thesis are discussed with the benefit of first hand knowledge and many with the help of return trips allowing for further reassessment

I should like to take this opportunity to thank my supervisor Robert Gibbs for comments, criticisms and encouragement over the past years. At the same time, I gratefully note my indebtedness to Professor Elizabeth Moignard for continuing helpfulness, to Dr. John Richards for, not only his informative discussions, but generous free access to the typescript of his recently published book on Altichiero, to

Lorenzo Bartoli for his help in discussing Cennini's and Ghiberti's texts and to Professor John C. Brown Astronomer Royal for Scotland for his helpful discussion of the Dante experiment. I should also like to express my thanks to : Caroline Villers of the Courtauld Institute and Jo Kirby of the National Gallery, for their ready response to my queries and for taking time to meet me and discuss these; to the staff at the British Schools at Rome and Athens; to Dr Luca Baggio of the Centro Studi Antoniani in Padua; and to the Conservation Staff at Vergina. Additionally I am very much indebted to BBC Resources Scotland for the use of television facilities used in conducting my experiments, and in particular thanks are due to Vision Supervisors Dave Wood and Bill McKelvie for their active co-operation in these. My grateful thanks are also due to Lee Electric Scotland, manager George Thomson, for the willing provision of lighting equipment for use in these experiments, and to Black Multimedia and Information Design, managing director Gordon Black, who, in providing invaluable copying facilities, made the provision of the many illustrations a practical proposition. Lastly, but most importantly, I must note my grateful appreciation of the enduring patience and support of my wife over the protracted period of my studies.

INTRODUCTION

“All that the eye can possess is light.” Sir Lawrence Gowing.¹

I wish to examine the works of 13th and 14th century painters to see what these pioneers of European art made of light, and the accidents of its effects on our world, in the pursuit of convincing illusions of depth volume and space.

A great deal of attention has been paid to the re-establishment of the illusion of realistic picture space in the early Renaissance. Research into early indications of an intuitive reaching out for dependable techniques in the 13th and 14th centuries and then scrutiny of its mathematical development from the 15th, has employed many historians over the years. Additionally such work has been put into a broader early context by extending study into Greek and Roman times. Important modern works by J.White, G.Richter, P.M. Edgerton and M.Kemp, among others, have explored perspective in these early periods and the early Renaissance, while a substantial body of literature by artists, scientists and academics has built up over the centuries.² However, much of this has concentrated on the study of linear perspective. For example, a much cited book, *The Birth and Rebirth of Pictorial Space* by J.White, is really concerned with the geometry of linear perspective. The assumption is made throughout that any appreciation of picture space is controlled by optical geometry and that, having studied this, one has dealt effectively with depth in pictures. Picture space is implied as virtually synonymous with linear perspective and the contributions of light and shade effects are largely neglected. Such a priority given to linear perspective follows from Quattrocento usage. The term *perspective*, its Latin source *perspectiva* and its Italian counterparts *prospettiva*, or the earlier *perspettiva*, were originally understood to mean the science of optics, *Optica*, as established in ancient Greece. In this the Greek

tradition, which passed via Latin and Arab texts to the late medieval scholars and natural philosophers, generally covered all aspects of light and vision.³ Parronchi, before starting his *Studi su la Dolce Prospettiva*, felt he had to discuss the changes in the meaning of such terminology between the Duecento, when it was still synonymous with optics in general, and its significance in the early to mid Quattrocento. By then the vernacular version *prospettiva* became reserved for painters' geometric procedures which attempt to map visual sensations and record these on a plane surface, while the Latin *perspectiva* survived in academic circles to note the broader pursuit of optics and vision.⁴ In English there is no such distinction and in consequence *perspective* is taken to mean the mathematical procedures of projecting the forms of a notional visual image on to a plane surface. The usurping of the sense that this tended to explain all important aspects of picture space followed and is clearly a continuing habit of art historical thought. That such usage neglected any positive consideration of lighting effects in suggesting depth was both accepted, and in a sense criticised, quite early on when Leonardo felt the need to add *aerea* to *prospettiva* to make some points on the value of light and shade in creating depth within a picture.⁵

The study of linear perspective is attractive offering as it does a convenient and contained field for discussion with prospects of precise, and in many cases measurable, comparisons and quite definite conclusions. But, though it claims for itself the definition of picture space, it addresses only one part of the story. Light takes second place and for the most part in these studies it is accepted as uncovering form and then form is studied for itself.

Nonetheless, any framework which a linear perspective scheme might generate is a sterile and quite abstract thing, unless some objects are located within it. If the forms of these are to be recognised as the equivalents of three dimensional items, then

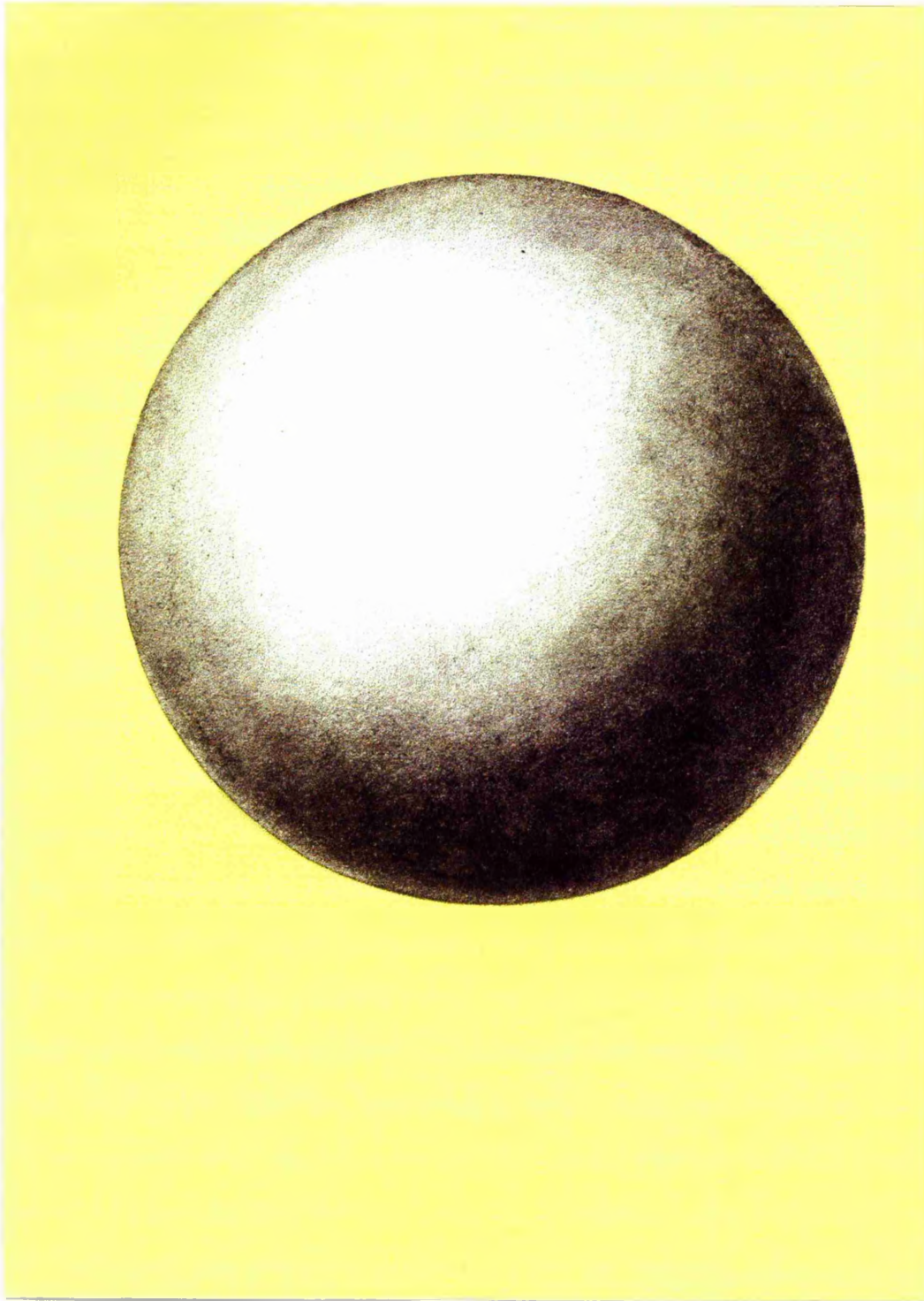


Fig.1: Sphere on plane, Pencil Sketch, 1995.

the play of light on the original objects must be offered in some planar analogue form, just as their simple geometric dimensions have been. Indeed, while the futility of an empty matrix of linear recession can really only be corrected by employing some variations in apparent brightness, it is possible to argue that light and shade can offer the illusion of depth without recourse to the devices of linear perspective. Consider the case of an image of a sphere against a plain background [Fig.1]. Here no geometry provides a clue to recession or projection, but gradations of tone across what is really a flat disc on the picture plane do just that. By mimicking the distribution of illumination on the original sphere an effective illusion is generated. An artist's perception and transcribing of the effects of light are then clearly an important element in his generation of simulated space and the convincing semblance of solid objects required to populate it. Nonetheless, E.H. Gombrich pointed out that, "while there is a large body of literature on perspective and the rendering of space the mastery of light has received much less detailed attention".⁶

Even though that statement was made in 1976, and P.Hills' important *Light of Early Italian Painting*, of 1987, comprehensively addressed the part light played in Duecento and Trecento painting, including its contribution to the early attempts at illusion, there still seems to be a continuing narrow pursuit of perspective, as generally understood as just a *disegno* based procedure, with geometry seen as the main depth producing factor in the early painting. The interactive part light and shade played is often ignored. For example, in two recently produced books, Hubert Damisch's *The Origins of Perspective* and James Elkins' *The Poetics of Perspective*, it is noticeable that in neither does the index record any entry for *shadow*, *shading* or *chiaroscuro*. They are addressing merely the geometry of recession. This is quite legitimate, of course, in the way the term has habitually come to be interpreted, indeed

even the above quotation by Gombrich implicitly leaves the rendering of space to *disegno*. In this there is no need to consider any effects of the phenomena of light and vision other than general disclosing illumination and rectilinear propagation. But really half the value of *perspective* is denied, if we wish to understand it, as is generally if tacitly assumed, to mean picture space, and so the more general appearance of depth in a picture. This narrower concentration on linear aspects is not really so surprising for, as suggested above, the geometry is accessible, readily measurable and conforms to an accepted mathematical discipline established over two thousand years ago.⁷

Alternatively, the other non geometric aspects of visual perception, colour and light, are only quite recently proving to be amenable to some coherent and cogent theories, and consequently to objective measurement. Within the last century new approaches in theories of vision have given some physiological meaning and relevance to the developments in the physics of light, which followed on from Newton's discoveries, though the psychology of visual perception is still an area of extensive debate and research.⁸

However, it is not formal theories which are of primary interest to my study, rather it is the more practical development by artists of an appreciation of light, intuitively explored and recorded to give impressions of depth and volume, which is central. So my approach, essentially technical, is centred on paintings rather than text in that it seeks an understanding of the practical thoughts of artists rather than those of scholars. The theories which were needed to explain light and vision were elusive and the province of the academics and philosophers. For their part, 13th and 14th century artists, when they made moves towards an art of illusion, felt the need to understand aspects of light and visual perception, for their own reasons and in their own way. They pragmatically sought solutions to the problems of simulating volume and space,

not only by line, but also by attempting to mimic the effects of light and shade, as they reached out for some semblance of spatial illusion. When their various intuitive adventures seemed successful they changed, expanded and refined accepted workshop practices, to offer new conventions and models. In some areas, as in their evolving naturalistic treatment of faces, their usage denied some of the current Duecento and Trecento theoretical concepts to accept a more modern understanding of light phenomena. But if not directly theory based, the evident rationale behind some of their standard workshop procedures and rules of thumb, in effect a broad body of “workshop theory”, does indicate some parallels between the erudite ideas of the scholars and the broad concepts of the artists. But such concepts were also a reflection of the traditional knowledge and preconceptions of the past, both orally transmitted, from masters to apprentices, and also followed through the examples of respected models from the past. The study of the various balances struck in this flexible mix, between the basing of their work on existing models of established quality, the observation of the world of visual phenomena and some broad appreciation of traditional and current theories, as reflected in the pictures painted and the continuing discussion it illustrates is the central theme of my thesis. But two other aspects of importance must be kept in mind.

First, the pictures in question were goods manufactured in an industry, often one of volume production, to commercially satisfy a market looking for guaranteed well crafted products, of enduring and intrinsic value.⁹ Second, they were also required to be items of fitting beauty to grace the church chapel or, less often, the home. In this, any evolving practices always had as their aim the provision of objects of aesthetic value. The criteria in the contemporary assessment of beauty were variable. These interacted with painting techniques as they developed, to inhibit some innovations and

favour others. At the same time these were evolving themselves, as the artists offered newer acceptable ways of looking at both objects and the ideas behind them.

My intention here is to look at how the treatment of light and shade in Italian Duecento paintings, was used to provide measures of effective illusion, to see what early examples might have been influential, what conventions and inventions were adopted and then, in following any evolution through into the Trecento, to see what aspects were cultivated and which were abandoned, either completely or temporarily. Besides the straightforward technical recording of signs of change, progression or reaction, there is a more important underlying motive. Looking at the early developments, experiments and graphic essays of different masters and their workshops across the period, both individually and as a group, in this Proto- or Pre-Renaissance period is akin to looking at the preliminary sketches and unfinished work of one particular artist. As Pliny wrote :

“ . . . the last works of artists and their unfinished pictures . . . are more admired than those which they finished, because in them are seen the preliminary drawings left visible and the artists’ actual thoughts... ”¹⁰

This idea of Pliny’s, of the value of unfinished and preliminary, uncorrected works, I believe can tell as much about a broad group of workers as it can about an individual. The understanding of one artist’s thoughts through speculative essays can be extended to cover a wider field and allow some insight into the developing attitudes of painters in general from the Duecento on through the Trecento, as the essential direction of European art is being determined. It might also, in the process, by prompting some fresh appraisals of ideas prevalent in the period, provide some new insights into general 13th and 14th century attitudes to light and visual phenomena. For, just as the individual artist is involved with his medium and his milieu in an interactive

relationship whenever he addresses his work, so the corporate approaches of painters and their workshops must involve and display a cultural dialogue with their craft and society. An important consequence of investigating their endeavours and solutions, be they partial or temporary, as expressed in such dialogue, hopefully will also be an insight into the attitudes and ideas of the time.

In this respect it is helpful to be aware of the re-invention and development of a new visual language, for “art is primarily a means of communication”.¹¹ J.White found that, “the extent to which the great Tuscan artists were, between them, evolving a new and common visual language, albeit it spoken with distinctive dialect inflections, and often used to say quite different things, has increasingly borne in on me”.¹² While, as argued by M. Baxandall in *Giotto and the Orators*,¹³ later in the Quattrocento and early Cinquecento, there was a correspondence between painting and sophisticated language, particularly in matters of composition, as a consequence of the intellectual ascendancy of Humanist Latin, it was much earlier, in the 13th and 14th centuries, that the needs of religious communication forced a readjustment to the nature of art to allow new messages to be disseminated and a new language emerged. A new “vocabulary” of images was required as the more human aspects of divine personae were stressed. The subtleties of light and shade offered the opportunity to provide new, credibly emotional and expressive, faces and figures. But more than that, the requirement that these be seen in recognisable earthly situations prompted aspirations for an art of illusion.¹⁴ In this visual fiction a three dimensional “syntax” had to develop to replace the surface-bound, and quite uncomplicated, co-planar, symbolic code, which had adequately served the simplicity of the earlier bare, authoritative and hieratic statements, particularly since the beginning of the 9th century.¹⁵ The common lighting environments being simulated were one effective way

to help interconnect the various elements of a composite picture. If later Humanist thought, language and commentary determined the final subtleties and elegant usage of this “syntax” and provided for the rigorous discipline of linear perspective, the adventurous essays of late Duecento and early Trecento painters pragmatically, if hesitantly, provided much of the ground work for this new language. In this respect, it has to be noted that Alberti’s theories left light, and its effects, as later minor additions to what, for him, were the more positive contributions of line and form.

Problems and Advantages of an Anachronistic Viewpoint

Such ideas on communication clearly suggest that any real understanding of painters’ thoughts ought to be gained through their work, and certainly I would like my essentially technical investigations to be based, as objectively as possible, on the procedures actually employed in the pictures of the period and those of their antecedents, both medieval and antique. It is self evident that we can only really understand history from our own point of view, and that the purpose of any study is to relate the past and its products intelligibly to our own times. But the many cultural differences which separate the 14th and 20th centuries make a simplistic technical appraisal of the paintings through modern eyes somewhat suspect. Anachronistic assessments could be misleading. Nevertheless, an *openly* anachronistic approach would be useful provided it is undertaken with the awareness of likely cultural time traps. It could clearly highlight such differences or similarities as appear to exist. Such disagreements or concordances certainly have to be examined with allowance made for any possible cultural differences arising from changes in attitudes resulting from developments in European society and knowledge over the last 600 years. But, on the other hand, starting from an initial acceptance that life and society are very different

can lead to a too ready acceptance that some particular inconsistencies arise from cultural disparity. These might then be put aside as not susceptible to any reasonable present-day explanation, whereas a 20th century analysis, always pursued with sympathetic awareness of likely differences in outlook of course, might point to possible underlying motives or influences held in common between our Duecento and Trecento predecessors and ourselves. At the same time any attempt to seek common ground requires the scrutiny of 20th century ideas as well as the earlier ones so that our own modern concepts and attitudes are under healthy examination too.

Such an attempt at even handed appraisal then presupposes some understanding of the general ideas of the 13th and 14th centuries, and those traditions which preceded them, as well as a parallel understanding of the concepts of our own period. Thus despite my impatience to start any appraisal of the various technical aspects of Duecento and Trecento painting with the pictures themselves I am obliged, initially, to devote considerable attention to texts. The various conventions, traditions, theories and practices as available, explicitly or implicitly, in texts have to be studied both as a preliminary to seriously addressing paintings and as references to be consulted again when any interpretation is being made. Likewise, any modern understanding requires the consideration of current theories and more recent ideas on lighting phenomena and visual perception. Apart from the mixed advantage a 20th century viewpoint gives, I also wish to provide a longer perspective by looking back at the antique tradition. Just as the various works on linear perspective relate the developments of the Renaissance and the Early Renaissance to the endeavours and successes of antique workers, I intend to do the same, and look at the early history of light and shade. This I hope might further help in avoiding any unconscious 20th century bias by using, as a control, another set of artists and cultures not privy to our concepts of modern science. Besides,

it becomes increasingly clear in any study of late Medieval and Proto-Renaissance painting that, although we no longer have many direct examples of ancient art, many developments were a matter of the recovery and development of past traditions rather than any spontaneous outburst of innovation. In this respect it is worth while considering that, “in neither the East nor West did medieval art ever eliminate the discoveries of Greek art”.¹⁶ Many of the concepts, and some examples, of the past were still available, albeit in a confused heritage overlaid and distorted by a mixture of fashions and trends, to allow for the uncovering and selection of a number of the techniques already employed and refined in antiquity.

Texts and Literature

Available primary literature, particularly of a technical nature, is limited. Some early writings by antique artists are recorded but are no longer extant. Euphranor and Apelles, for instance, were noted in this respect.¹⁷ Of such professional writings only Vitruvius’ *Ten Books on Architecture* survives to give some brief insights into the technicalities of decorative aspects of buildings.¹⁸ Other texts make indirect reference to, and passing comments about, painting in illustrating other topics. One major text in this respect is Pliny’s *Natural History*.¹⁹ This is a broad compendium of information garnered from many still earlier sources, primarily concerning the nature of materials, but with some claim to reflect many venerated painters’ writings.²⁰ In digressing into anecdotes about the uses of these materials he touches on Greek and Roman art prior to the 1st century A.D. Pliny’s Books XXXIII to XXXVI are particularly helpful for picture making, in both painting and mosaic. A very variable melange, the authority of this compilation of traditions, aimed at a popular rather than an academic audience, can hardly be relied on as precise factual history. Nevertheless,

with some scepticism as to the extent of legend and myth within it, it might be read, together with other indirect references, and the few surviving antique images, as offering a general picture of ancient thinking concerning the nature and development of painting.

Other texts with oblique references to the technicalities of painting occur in both Greek and Roman writings concerning a variety of subjects including rhetoric, philosophy, politics and ethics. Painting and other arts appear as illustration in some critical appraisals, though these, more often than not, are stylistic analogues in literary discourses, and often the subject matter of epideictic writing. Examples can be sought in the works of Quintilian, Lucian or Cicero. They also appear in the earlier works of Greek writers, such as Plato and Aristotle, but again the focus is not on specific technicalities.²¹ Besides any incidental pictorial references these few surviving early Greek texts also carry important philosophic discourses which set the pattern for much of the thinking, general as well as academic, for many centuries. Subsequent considerations of these matters appear in influential 13th century writings by Grosseteste,²² Bacon and Pecham,²³ which then had a seminal influence on late medieval thought. The nature of light and visual perception was a prominent feature in these and much of the survival of the earlier optical theories had resulted from continuing interest by Islamic natural philosophers. Of these Arab scholars perhaps the most influential was Alhazen and a full translation of his *Optics* is now available.²⁴

A few medieval texts survive which are more specifically about the technicalities of painting. The main books of value are :

M.P. Merrifield's *Original Treatises on the Arts of Painting*.²⁵ This is old but still helpful. Modern commentaries offer some corrections, but direct access to the original writing and her parallel texts are beneficial.

Theophilus' *De Diversis Artibus*.²⁶ The C.R. Dodwell version with parallel texts allows useful separate access to the original Latin and his translation. The later version by J.G. Hawthorne and C.S. Smith provides further background, and as they noted themselves an alternative translation has benefits since "two opinions are of more value than one".²⁷

Cennino Cennini's *Il Libro dell'Arte*.²⁸ The 1932, D.V. Thompson edition, reissued in 1960, is still the standard English translation. But it does need some updating after 60 years, and written, quite obviously, in places to provide "equivalents... in colloquial use by modern English-speaking painters" it has practitioners rather than historians in mind.²⁹ But some of its free translations can mislead,³⁰ and on the basis noted above that "two opinions are of more value than one" some alternative interpretations are needed. In their absence a recent edition of the 1859 Milanese version of the Italian text, edited by F.Tempesti, is helpful in checking on suspect details.³¹ While the Cennini work appears to have been written at the turn of Quattrocento it reflects working procedures of the Trecento.

Later writings by Ghiberti, *I Commentarii*,³² Alberti's 1435 *De Pictura* and 1436 *Della Pittura*,³³ and then Leonardo da Vinci writings,³⁴ provide a retrospective, but immediate view from the Quattrocento to tell, through signs of change, and comment, of the recent past, while a number of modern commentaries provide assistance in navigating through the early works.³⁵

A good number of books provide a wide social and historic context in which to appreciate the period's art and artists,³⁶ but broader aspects of the culture and attitudes surrounding the period's painters can be sought in contemporary literature. Dante Alighieri's works were invaluable here. As a polymath, he provided a bridge between the scientific thought and art of the time, and, as we see in the *Divine Comedy*,³⁷ he

made these more generally accessible with his promotion of the vernacular rather than Latin.

As regards today's theories and concepts, while there are many texts purely on the physics of light, R. Osbourne's *Lights and Pigments, Colour Principles for Artists*,³⁸ provides modern information on the objective pictorial nature of light's properties with care taken to offer this in accessible ways related to picture making. With more subjective effects in mind a prime concern must be vision and visual perception. Bruce and Green's *Visual Perception*,³⁹ is useful here, offering a concise look at the current state of theories in the physiology and psychology of sight, including commentaries on the two major directions these studies have recently taken : Marr's ideas offered in *Vision : a computational investigation into the human representation and processing of visual information*,⁴⁰ and those of Gibson presented in *The Ecological Approach to Visual Perception*.⁴¹ At the same time the books of two leading authorities, who are particularly effective in communicating the present state of their own and colleagues progress are invaluable. S.M. Zeki's, *Vision of the Brain*, describes the electro-physiology of the human brain with particular reference to sight and colour vision,⁴² and R.L. Gregory's *Eye and Brain* is one of his many books which discuss human responses to phenomena involved in the psychology of seeing.⁴³ Besides these *The Artful Eye*, edited by R.L. Gregory, helpfully and conveniently covers current ideas on visual perception and associated psychology while relating these to our attitudes to images and paintings.⁴⁴ At the same time *Art and Illusion* by E.H. Gombrich⁴⁵ and R. Arnheim's *Art and Visual Perception*⁴⁶ also help, in approaching visual perception from a particularly art based perspective.

Assessment of Paintings

With an initial survey of conventions, traditions, practices and theories, ancient, medieval and modern as background, and available for subsequent reference, a more meaningful approach to Duecento and Trecento paintings can be made. The general procedure then requires the inspection of a large number of pictures. Initial assessments relies on reproductions and, with errors likely to arise from the many discrepancies of colour and contrast appearing from printing inaccuracies and deteriorating slides, careful comparisons of alternative prints and slides is required. Accessible originals in UK galleries are then scrutinised and a series of pre-planned visits made to Italian galleries and churches with specific original works in mind. The visits allow the tentative observations to be reassessed with the originals directly available besides allowing the range of works studied to be expanded.

Such visits to galleries and churches draw attention to problems of viewing works other than in the locations for which they were intended. Gallery viewing with modern lighting shows many of the works out of, not just a physical context, but also their intended spiritual ambience, since the works are mainly intended for churches. With the nature of tones and colour of particular interest to me the distortions of the light and shade are important. The visits, however, allow a sight of the contexts in which the works were to be placed and also some occasional sight of relevant items still *in situ*, although even here modern lighting has generally replaced the original illumination. This experience does help to offer a guide as to the allowances to be made in subsequent gallery scrutiny and, importantly, in later study from reproductions. Where possible reproductions are carried and these are annotated as to the discrepancies appearing between them and the originals to assist in later study. Certainly many modern reproductions can be quite accurate for general viewing, but

commercial pressures seem often to generate over-glossy glamorised prints for “coffee table” books and while this, and the resulting volume production, does provide economic publications and so aid general accessibility, the results are often misleading. This is particularly true of many fresco reproductions where the contrast produced and helped by glossy paper is often a visual fraud, if a commercially attractive one. One noticeable attempt to avoid such results was J. & M. Guillaud’s, *Giotto Architect of Color and Form*.⁴⁷ This had many major fresco examples from the *Arena Chapel* printed on “onion skin” tissue. This material with its soft matt surface allowed a much better approximation to the actuality of the frescoes.

Attribution and Individuals

With the provision of paintings in the 13th and 14th centuries being essentially a volume production industry the individual is rather lost in corporate activity. Developments in 13th and 14th century painting cannot be followed simply as the progress of individuals’ inventions. Fortunately this study is not interested in attribution, *per se*, but in general trends and attitudes. Where authorship is noted this is in step with generally accepted attributions and is, in the main, just a conventional tag to specify the work in question. In the ebb and flow of technical progression through experiment, trial and error, and then assimilation of procedures into practice, the appearance of individual adventures in any particular chronology, geography or from a designated hand is interesting, but does not affect my basic intention which is to observe the technical debate and try to appreciate the motives and thinking behind its graphic manifestations. At the same time, where isolated exhibition of a precocious excursion occurs, some personal accountability is surely required. So that, for example, Giotto must be singled out for bold experimentation in the *Arena Chapel*, or

Pietro Lorenzetti for his in the Lower Church at Assisi. But again, even where any of the works in question are not autograph the innovations are likely to have had the sanction of the eponymous workshop master, and the nature of any particular departures of note discussed and sanctioned.

Different Aspects and Topics of Study in Paintings

This study of painting development follows several themes. The different elements and aspects of painting, having different priorities placed on them, were treated differently, and so their development varied in time and extent. Of these the most important, meriting study before any other, is the presentation of faces.

Faces: With art's concern being human communication, humans themselves, and also the human forms of divinity, are the main subject matter in 13th and 14th century European representations. The individuality and expressiveness of faces was central to an art now looking for a sense of the mortal nature of its subjects rather than their divine intangibility. Consequently it is no surprise that it is in this matter of faces that early successful attempts were made to provide some semblance of solid presence in convincing light and shade. At the same time special precedence given to the human face was often reflected in a reluctance to have intrusive modelling interfere too drastically, particularly in the case of venerated subjects like The Virgin Mary.

Clothing, Fabrics and Materials: The immediate context for faces is clothing fabric. The light and shade on garments of depicted characters provides additional information on depth around the faces and figures to tell of the volume and weight of the body and its parts, legs, arms, torso etc. within the garment and of the nature of the garment itself. Where some restraint might have left revered faces relatively lightly modelled, garments and furnishings with less inhibited treatments and robust

modelling were available to give a compensating positive sense of volume and space to the picture as a whole. Such less inhibited usage more clearly illustrates the artists' developing concern for light and its effects.

Interiors and architecture: Interiors and architecture are the next areas of interest to be discussed. Here, rather than the organic or random forms of faces and clothes, geometrical and more predictably structured forms allow for clear signs of the interaction of light and shade with linear perspective. Essays at showing extended depth and space besides volume and solid presence are of significance here. They offer another distinct sphere in which to seek evidence of the implementation and testing of the "workshop theories" and new techniques.

Landscape: Examination of approaches to landscape depiction follows. The further attempts here to bring an illusion of natural distance into pictures, this time without the mechanical aids of predictable man made planes, brings the conflict of current understandings of light's propagation into focus in a different way. In observation of a wider and frustratingly ever changing nature the evidence of the eye and theoretical concepts are at odds making artists' resolution difficult and their results informative.

Night and Artificial Light : While natural light and its effects are interesting, its absence, as night, prompts some contemplation and solutions worth studying. With no light, strictly speaking there can be no picture. Any inventions to circumvent such a problem must demonstrate some of the thinking behind them. Continuing in that vein those pictures in which artificial or supernatural light feature can be illuminating in more ways than one. With a source of illumination actually within the picture frame, light as well as its effects is under consideration.

Shadows : The final subject of interest is that of cast shadows. Sharply defined ones are found in only a few works and do not become a regular element in painting until the first decades of the Quattrocento with Masaccio and Gentile da Fabriano. Nonetheless, as it is clear they were consciously depicted in a few earlier works, their appearance is worth studying as indications of obvious serious, if isolated, precocious interest by some Trecento artists. Soft gradations in tone also appear which might suggest some gentle shadowing. These merit close scrutiny. Some must have been consciously provided as shadow features while others, pseudo-shadows, seemingly appear gratuitously as by-products of tonal tactics aimed at suggesting depth in other ways.

Conclusion

The various developments of the different thematic areas, while addressed, separately, over the 13th and 14th centuries, are not isolated, they interact. Neither do they run in synchronism, each progressing, and regressing, at different times and rates. Individually they offer some pertinent illustration of the technical and aesthetic debates involved in regenerating an art of illusion. Together they combine to give, in the pictorial products of the 13th and 14th centuries:

1: A sense of a history of graphic evolution, supporting what was an initial, implicit, assumption of teleological interpretation of the various moves towards an art of illusion.

2: A wider picture of the mechanics and complex timetable of change and reaction, with indications of both the adherence to standard procedures and, or exemplars and, alternatively, adventurous inventiveness and also the balance between these at different periods.

3: A broader insight into the sensitivities and sense of decorum of the period with obvious priorities afforded to different personalities and subjects in the application of skills, so that a hierarchy of subjects requiring sliding scales of reverence and protection from the intrusions of the varied innovative techniques, can be discerned.

4: A better understanding of the valuable contribution made by the artists of the period to European painting

Introduction Notes

- 1: L.Gowing, *Vermeer*, London 1972, p.67.
- 2: J.White, *Perspective in Ancient Drawing and Painting*, London, 1956, and *The Birth and Rebirth of Pictorial Space*, London, 3rd edition 1987. G.M.A.Richter, *Perspective in Greek Art*, London, 1970. S.Y.Edgerton Jr., *The Renaissance Discovery of Linear Perspective*, New York, 1975, and *The Heritage of Giotto's Geometry : Art and Science on the Eve of the Scientific Revolution*, Ithaca & London, 1991. M.Kemp, *The Science of Art*, New Haven & London, 1990, follows the many various developments and studies in linear perspective from the inventions of Brunelleschi onwards.
- 3: D.C.Lindberg, *Theories of Vision from Al-Kindi to Kepler*, Chicago, 1976, pp.xiii. ff, outlines the early theories. *Ibid.*, p.xiii, "Despite some overlapping, three broad traditions appear to contain the bulk of Greek optics : a medical tradition, concerned primarily with the anatomy and the physiology of the eye and the treatment of eye disease ; a physical or philosophical tradition, devoted to questions of epistemology, psychology, and physical causation ; and a mathematical tradition directed principally toward a geometrical explanation of the perception of space." *Ibid.*, p 15. The term *optica*, and its Italian derivative *ottica*, comes into Western considerations with Ptolemy's 2nd century *Optica*. This became available in the mid 12th century through the Latin translation by Admiral Eugene of Sicily of an Arabic version of the Greek original. Concerning *Perspectiva* D.C.Lindberg, ed., *John Pecham and the Science of Optics: Perspectiva Communis*. Madison, 1970, p.33, summarises the scope of Pecham's influential, late 13th century, text book. Part I covers vision proper or vision by direct rays, Part II vision by reflected rays and Part III, vision by refracted rays. Lindberg continues, *ibid.* p.33, " Since the *Perspectiva Communis* surveys virtually the entire field of optics, it may appear that the title *Perspectiva* (or at least the English cognate *Perspective*) is inappropriate to the contents ; for the book deals not only with perspective, but with all medieval questions that could be classified as optical."
- 4: A.Parronchi, *Studi su la Dolce Prospettiva*, Milan, 1964, pp.3-5, relates and comments on the evolution of the terms.
- 5: *Ibid.*, p.7, and Leonardo da Vinci, *Treatise on Painting*, [CodexUrbinas Latinus 1270], trans. A.Philip McMahon, Princeton, 1956, Vol.I, p.101, "There is another perspective which we call aerial, because through the differences in the air we can perceive the varying distances."
- 6: E.H.Gombrich, *The Heritage of Apelles*, Oxford, 1976 p.1.
- 7: For availability of Euclid in Europe, T.Heath, *A History of Mathematics*, Vol.1 *From Thales to Euclid*, Oxford, 1921 pp 361-370 & 419-21.
- 8: S.M.Zeki, *A Vision of the Brain*, Oxford, 1993, provides a concise outline of current thinking on the physiology of visual processes. D.Marr, *Vision: A Computational Investigation into the Human Representation and Processing of Visual Information*, San Francisco, 1982, and J.J.Gibson, *The Ecological Approach to Visual Perception*, London, 1986, offer alternative psychological theories of visual perception. The two avenues are discussed in V.Bruce & P.Green *Visual Perception, Physiology, Psychology and Ecology*, 2nd edition, Hove, 1990. pp.375-392.
- 9: I.Origo, *The Merchant of Prato: Francesco di Marco Datini*, London, 1957. pp.236.-237. It is clear the acquisition of paintings for the home and for gifts to

Churches was very much a commercial transaction, with the quality of material being paramount. However, p.239 does indicate that some assessment of quality of workmanship was also involved, with arbitrators involved in a payment dispute judging, “they had never seen so fine a piece of work”.

- 10: Pliny the Elder, *Natural History*, ed. & trans. H.Rackham, London, 1952, Bk XXXV, 145, “illud vero perquam rarum ac memoria dignum est, suprema opera artificum imperfectasque tabulas, . . . in maiore admiratione esse quam perfecta, quippe in iis liniamenta reliqua ipsaeque cogitationes artificum spectantur.”
- 11: Isaiah Berlin, Broadcast, BBC Radio 4, March 1998.
- 12: J.White *Art & Architecture in Italy 1250-1400*, 3rd edition, New Haven and London, 1993, p15.
- 13: M.Baxandall, *Giotto and the Orators : Humanist observers of painting in Italy and the discovery of pictorial composition 1350-1450*, Oxford, 1971.
- 14: Kemp, *op. cit.*, p.335, “striving for ‘domestic’ naturalism in religious art in response to new kinds of devotion (was) a necessary background condition for the notion that an illusion of how things appeared was desirable.”
- 15: H.P.L’Orange, & P.J.Nordhagen, *Mosaics*, trans.A.E.Keep, London 1966. p.10, L’Orange, writes “Modelling of plastic form disappears towards the beginning of the Middle Ages: swells and depressions give way to planes and lines, figures cease to be of a bodily nature. The final stage of this transformation, the ultimate in non-corporeal, two dimensional and linear expression, appears to have been attained in the Roman art of the eighth and ninth centuries: for example , in the almost supernatural mosaics which embellish the Roman Churches of Pope Paschal I (817-24). In these mosaics holy men and women appear before us as completely devoid of bodily substance, as if transparent . . . Human beings are transformed, transfigured, sublimated in a spiritual world, with the golden ground diffused about them as divine halo.” and p.64, Nordhagen: “ in the seventh and eighth centuries A.D. a gradual simplification takes place in the use of colour in mosaic art. This development is closely connected with the evolution from plastic illusion to two dimensional style, evident in all art at this time. When the linear style ruled in its most extreme form, in Rome around A.D. 800, the component parts of the picture appear as strongly outlined planes of uniform colour without any attempt at plastic modelling
- 16: E.H.Gombrich, *Art and Illusion*, 5th ed., Oxford, 1977, p.125.
- 17: Pliny, *op.cit.*, Bk XXXV-129, notes Euphranor wrote on proportion and colour, while Bk XXXV-79, tells of Apelles, “publishing volumes containing the principles of painting.”
- 18: Vitruvius, *The Ten Books on Architecture* trans M.H. Morgan, New York, 1960.
- 19: Pliny, *op.cit.*
- 20: *Ibid.*, Bk I-p.157, lists Pastiles, Apelles, Melanthius, Euphranor, Parrhasius and Apollodorus among his sources.
- 21: Some modern commentaries help in interpreting the various aspects of antique art involved here and of these the most helpful is J.J.Pollitt, *The Ancient View of Greek Art, Criticism , History and Terminology, Student Edition*, London, 1987.
- 22: A.C.Crombie, *Robert Grosseteste and the Origins of Experimental Science 1100-1700*, Oxford 1983.
- 23: D.C.Lindberg, a) *John Pecham and the Science of Optics : Perspectiva Communis*, Madison, 1970, b) *Theories of Vision from Al-Kindi to Kepler*, Chicago, 1976. c) *Roger Bacon's Philosophy of Nature: A Critical Edition of 'De Multiplicatione Specierum' and 'De Speculis Comburentibus'*, Oxford, 1983.

- 24: Alhazen, *The Optics of Ibn Al-Haytham Books I-III On Direct Vision*, trans. A.I.Sabra, Vol.I&II, London 1989. A earlier but *incomplete* Latin version was available in the 13th century. This appeared later as *De aspectibus in Opticae thesaurus Alhazeni Arabis libri septem ...* edited by F.Risner, Basel, 1572.
- 25: M.P.Merrifield, *Original Treatises on the Arts of Painting* London, 1849.
- 26: Theophilus: *De Diversis Artibus*. ed. C.R. Dodwell, London 1961.
- 27: Theophilus, *Theophilus: On Divers Arts, The Foremost Medieval Treatise on Painting, Glass making and Metalwork*, trans. & ed., J.G.Hawthorne, & C.S.Smith, New York , 1979, p.xxii. “.. we have retained our independent wording, in the belief that two opinions are of more value than one and that the full meaning and color of the original are more closely to be found by diversity in translation and scholarly translation.”
- 28: Cennino Cennini, *The Craftsman's Handbook, Il Libro dell'Arte*, trans. & ed., D.V.Thompson Jr, New York 1960.
- 29: *Ibid.*, p.xiv states the author's “belief that those expressions represent the nearest equivalent to Cennino's terms which can be found in colloquial use by modern English-speaking painters”. Also p.xiii tells of Thompson's intention that his translation “give first place where ever possible to the convenience of the practising student and painter”.
- 30: *Ibid.*, p.92, has “. . . around towards the light part of the figure” while the Italian reads “inverso il lume della figura.”
- 31: Cennino Cennini, *Il Libro dell'Arte o Trattato della Pittura di Cennino Cennini*, ed. F.Tempesti, Milan, 1975.
- 32: L.Ghiberti, *I Commentarii*, ed. L.Bartoli, Florence, 1998.
- 33: L.B.Alberti, *Della Pittura*, ed. L.Mallè, Florence,1950..
L.B.Alberti, *On Painting* trans. & ed., J.R.Spencer, London & New Haven, 1966.
L.B.Alberti, *On Painting and Sculpture: The Latin Texts of De Pictura and De Statua*, ed., C. Grayson, London, 1972.
- 34: Leonardo da Vinci, *The Note Books of Leonardo da Vinci*, trans.E. MacCurdy. 2 vols., London, 1938. Leonardo da Vinci, *Treatise on Painting*, trans. A.Philip McMahon, Princeton, 1956. *Leonardo on Painting, An Anthology of Writings by Leonardo da Vinci*, ed. M. Kemp, trans. M.Walker, New Haven and London, 1989.
- 35: M.Kemp's *The Science of Art*, *op. cit.*, is very helpful on technicalities. More specific to period attitudes to colour are M.B.Hall, *Color and Meaning*, Cambridge, 1992 and J Shearman, *Developments in the use of Colour in Tuscan Painting of the Early 16th Century* , Doctoral Thesis, Courtauld Institute of Art, University of London, 1957 while a general review of colour from antiquity onwards is J.Gage, *Colour and Culture: Practice and Meaning from Antiquity to Abstraction*, London, 1995. However, in the focusing on light the major help and direction comes from P.Hills, *Light of Early Italian Painting*, New Haven and London, 1987.
- 36: For an insight into the position of the artist in the period A.Martindale's *Rise of the Artist in the Middle Ages and Early Renaissance*, and I. Origo's *The Merchant of Prato* are of particular value. Of a number of books which provide a broader social and historic context in which to appreciate the period's art and artists, the following are very useful: D.Waley's *The Italian City-Republics*, J.Larner's, *Culture and Society in Italy, 1290-1420*, and *Italy in the Age of Dante and Petrarch, 1216-1380*, and M.Barber's *The Two Cities, Medieval Europe 1050-1320*.

- 37: Dante Alighieri, *The Divine Comedy*, trans. J.D.Sinclair, New York, 1961, 3 Vol:
Vol. I, Inferno, Vol. II, Purgatorio, Vol. III, Paradiso.
- 38: R.Osborne, *Lights and Pigments, Colour Principles for Artists*, London, 1980.
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CHAPTER 1

CONVENTIONS AND THEORIES OLD AND NEW

In comparing modern ideas^s with those of the 13th and 14th centuries, and before, it must be noted that the differences being allowed for in any discussion are conditioned by cultural contexts and are not innate. The assumption made here is that in the time scales involved, 600 years, and even 2,500 years when ancient works are considered, the psycho-physiological make up of human beings has not evolved in any dramatic way. Physical remains give no indication of fundamental changes and the writings of ancient thinkers reflect, in the realm of vision, responses to natural phenomena consistent with our own. Those processes and basic responses innately involved are the same for modern humans as they were for 6th century Greeks, and the physical environment is substantially the same even if the cultural one is different.¹

There is one point of difference worth disposing of immediately. While we now accept that the eye is a passive organ, a receptor for external light stimuli, there had been two basic theories of vision in antiquity, and both were still advocated and debated in the 13th and 14th centuries. One, the theory of *intromission*, held that light stimuli radiated from the object being viewed and these generated a response in the eye. Alternatively, the theory of *extramission* insisted that the eye was not a passive organ of sight, but sent out sensory rays to actively assess such an object.² In later centuries intromission became the accepted theory with the eye purely an organ responding to light impinging on it. The dispute on such matters was still a matter of debate into the Quattrocento, when Alberti writes in *De Pictura*, in 1435, “indeed among the ancients there was considerable dispute as to whether these rays emerge came from the surface or the eye. This truly difficult question, which is quite without value for our purposes, may here be set aside.”³ Certainly the end effect in both cases

was, for all practical purposes, really the same for painters, and Alberti omits it from his Italian version, *Della Pittura* of 1436.⁴ This is also true for this study and so, while the two are mentioned for completeness, these theories do not affect the essentially technical discussions here.

Modern Ideas and Terms

A brief outline of basic current lighting terms and the phenomena they signify is appropriate before attempting to try to relate Duecento, Trecento and earlier concepts and practices to modern ones. There is, though, some considerable divergence in accepted meanings, making for a lack of precision and frequent ambiguity. In this I will tend to favour those terms nearest normal or popular usage to facilitate easy discussion, qualifying these in special cases or to avoid ambiguity, rather than straying too far into obtuse technical terminology.

Light we consider as energy radiating from an active source, like the sun or a lamp, or re-radiated from an illuminated reflecting surface. In each case it travels in straight lines through a transparent medium until it is **refracted**, that is diverted on to a new alignment by passing into a medium of different density or until it is stopped by an opaque body. In the second instance the obstruction causes loss of light beyond the intervening object and also results in some measure of the incident light being redirected as **reflected** light. A **cast** or **projected shadow** will be apparent if a further object or plane in the direction of propagation intervenes to show the signs of the initial interference. Where the obstruction and the shadowed area are part of the same object, as for a nose and its neighbouring cheek, an **attached shadow** of the former is produced on the cheek. On the side of the obstructing object which is turned away from the light the lack of light produces **self shadow**. There are, of course, instances

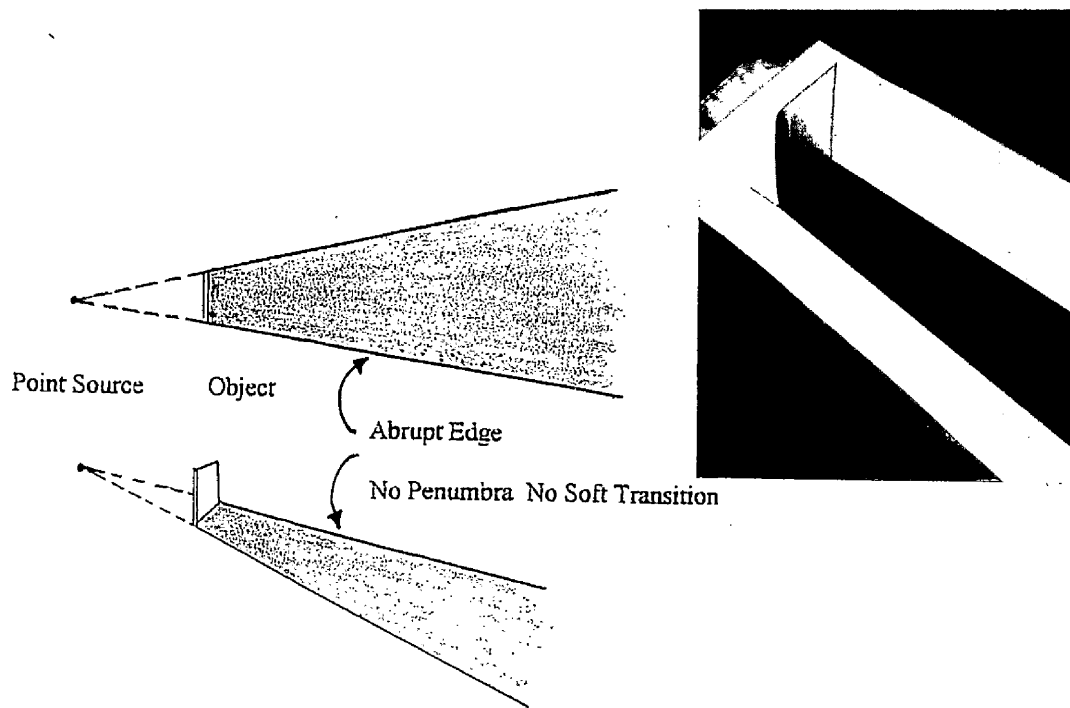


Fig. 2: Point Source, Hard Edge to Shadows.

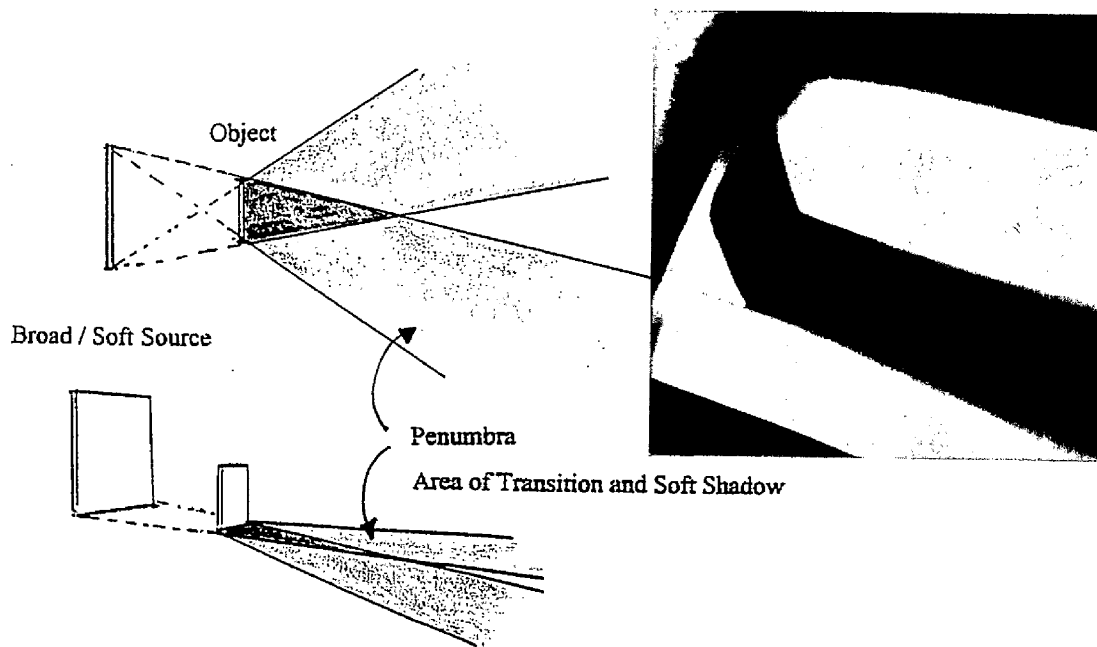


Fig. 3: Large or Broad Source, Soft Edge to Shadows.

where the various shadows run into one another and might be confused. For example, where oblique lighting throws the attached shadow of a nose over more than the entire cheek it meets and merges with the self shadow on the side of the head.

The size of any source relative to the intercepting body is a determining factor in the nature of shadows produced. Light from a compact spot of light is abruptly cut off by an obstruction and so the transition between lit and dark areas behind it means a cast shadow there has sharply defined, hard, edges, whereas the radiation from all points on a larger area of light is only progressively obstructed and the resulting edge is indistinct and soft [Figs.2 & 3]. The resulting general terminology for the nature of light sources here labels the compact light a **hard, point** or **spot** source, while the larger light is termed a **soft, broad** or more rarely an **extended**, source. The progressive transition between the unobstructed light from a soft source and the limit at which all light is intercepted is termed a **penumbra**, with the rarely used term for the totally deprived zone being the **umbra**.

While radiating in all directions the useful effect of any light, best defined for our purposes as its strength within a unit area, at a particular distance from its source, is **illumination**, or occasionally **illuminance**; the international measure is the *lux*, that is 1 *lumen* per square metre. The terms intense and intensity are best left as general modifiers or as the commonly employed subjective description of vividness of colour. The apparent **brightness**, technically **luminance**, of any illuminated surface is a measure of the light reflected from it ; the measure is again in lumens per square metre, though to differentiate the phenomena the units are strictly *apostilbs*. This is dependent not just on the nature of its constituent material, in terms of colour and its basic ability to reflect the illumination, but also on the angle which the incident light is intercepted by the surface. An area normal to the incoming light is illuminated more

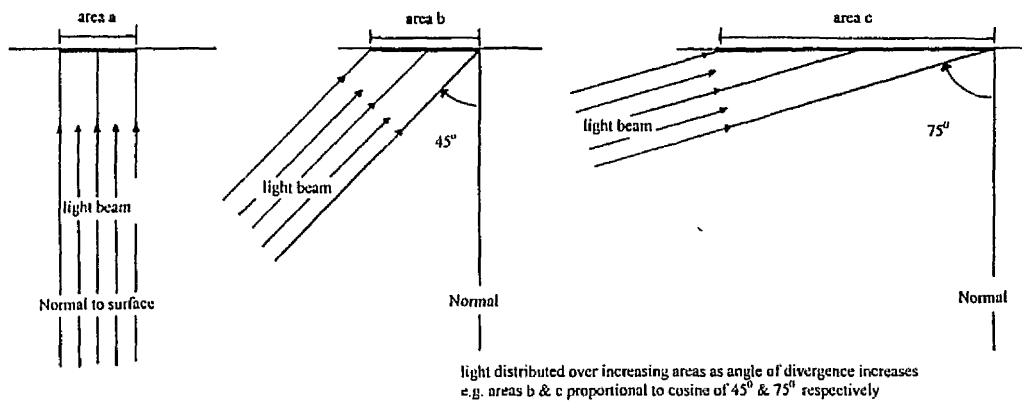


Fig. 4: Cosine Law reduction of effectiveness of light resulting from increasingly oblique angle of illumination

effectively and so is brighter than one tilted away from the source. In fact, the efficacy of the illumination reduces as the angle of incidence inclines away from the normal, following a cosine law [Fig.4]; to be zero as it arrives parallel with the surface plane. With such progressive variation, as in the curvature of the cheek, the result is graduated **shading**, some times termed **tilt shading**, and its variations appear as **tonal modelling** when represented on an image. Once more it is worth noting that different effects can run into one another and be confused. Shading, as a lighting effect, can often extend to become continuous with attached shadow (noted above p 51-52). Other confusions concerning shading are also inevitable for, as a piece of general terminology, of course, it is shared with the graphic procedure of adding or modulating different tones, in painting or drawing, and also with a general non-specific obstruction of light, as by a parasol or awning.

The degree of **contrast**, that is the range of brightness variation between shadowed and illuminated areas, may be moderated by any additional light source, or sources, available to dilute any shadows. Where the diluting illumination takes the form of the aggregate of miscellaneous accidental reflections in the local environment, it is termed **ambient light**, or sometimes **global illumination**, a term now being used in computer graphics.

The indiscriminate emission of light from a soft source or its reflection from a large surface, in all directions, is designated **diffuse**. A perfectly diffusing surface, termed **Lambertian**, has noteworthy qualities.⁵ Viewed at right angles the light emitted from the lit area, that is its brightness, may be assessed at a certain level. On moving to the side to view the surface obliquely, the area presented to the new position varies as the cosine of the angle of deviation from the normal. But the total amount of light presented to the new viewing position varies in exactly the same way,

again following a cosine variation. In consequence, the reduced light received at the viewing position matches the reduced area presented and ~~the~~ so the specific brightness, that is light per unit area, remains constant.

An alternative mode of reflection, where an illuminated surface is polished like a mirror, is termed **specular**, and any light is reflected, unscattered and at an angle matching that of its incidence. In this instance, a maximum level of light is presented to any viewer aligned with the angle of reflection, and the resulting sharply defined highlight moves with viewer's realignment, offering the colour of the light rather than that of the reflecting material. Of course diffuse and specular reflections do not just occur in isolation. In many cases they appear together to tell of various surface textures. For example, the latter could provide indications of sheen on the undulations of an otherwise bright even plane to suggest silk rather than cotton whose matt surface approximates to a Lambertian reflector.

Other aspects of light concern the nature of its colour or **chromatic** make up. Here **hue** specifies precise characteristic colour within a gamut including both the spectrum and the extra-spectral mixes around purple. The measure of a colour's purity, its freedom from white or other neutral contamination, is termed **saturation**, though often, more loosely, intensity or brilliance are found employed. The effective luminance of an illuminated object, independent of saturation and hue, as already noted, is its **brightness** or **value**, often expanded, avoiding ambiguity, to **tonal value**. These terms require some further detailed explanation in connection with colour.

Modern theories on colour vision provide for some explanations of our reactions to colour stimuli, but there is continuing debate and research in this area. In this respect S.Zeki's *A Vision of the Brain*, has a very informative, authoritative but

accessible, exposition of recent theories concerning our visual responses, particularly as regards colour.⁶

Light is considered to be a flux of a whole range of radiant electromagnetic energy. The human eye responds to a limited spread of frequencies of this energy. Within that response the eye's reaction, when processed by the brain, makes a sophisticated assessment of the comparative levels of such energy at, it appears, three different points, corresponding nominally to Red, Green and Blue, on the gamut of this energy. Through this we learn of the apparent nature of the distribution of light radiated, or reflected, from any object viewed, be it passively illuminated or a source itself. That is, we determine its apparent colour. Unfortunately colour is a very variable thing both *objectively*, as we measure it, and *subjectively* as we perceive it.

A more precise *objective* specification of colour is measurable in terms of **hue**, **saturation** and **tonal value** and is dependent on different factors.

The light incident on a surface can vary, with different mixtures of the radiated frequencies comprising it. Candlelight, sunlight, and cloudy daylight for example have different admixtures of radiant frequencies. The candle's light, very much lacking the blue constituents, is decidedly orange or yellow. Other light sources can provide illumination limited to particular frequencies, or mixtures of these, or some intervening semi-transparent material, for example stained glass, can filter out different frequencies to leave a particular colour or colours. In short, incident light can vary widely in chromatic terms.

The surface of the item illuminated will, depending on the nature of its material, reflect the various incident frequencies of light differently. A nominally "red" object reflects more red component frequencies while a "blue" object reflects more blue ones.

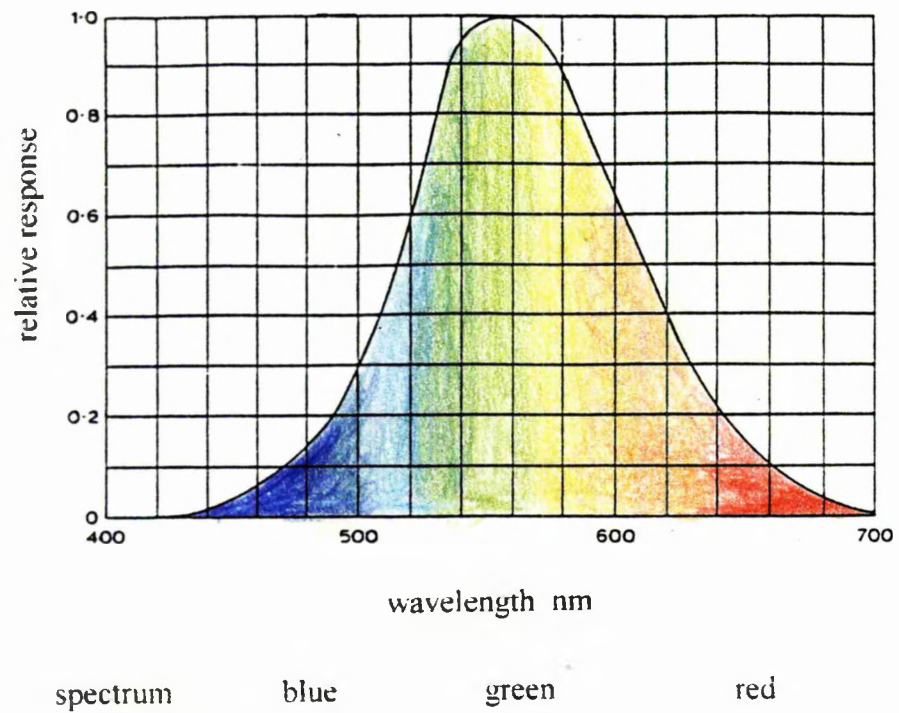


Fig.5: Photopic Curve, response of the average eye.

The level of light reflected gives a measure of the relative tonal value or **brightness** of the object. But the normal response of the human eye is not uniform over the visible spectrum. In good light conditions it has a peak of sensitivity in mid band, around green (approx. 555nm wavelength) and falls off above and below this. The nature of this response in the average human eye has been experimentally determined and the measurement of any light reflected is “weighted”, that is adjusted, to fit this standard or **photopic** response [Fig.5]. Light meters are normally arranged to respond in the same way.

Given a whole range of incident frequencies, say the broad spectrum of daylight, an object reflecting these equally across the band will be **neutral**, grey or white depending on the overall level of reflection.

An object reflecting one frequency of light to the exclusion of others provides a pure or **saturated** colour. Where, in addition, it also provides some general reflection across the band, its monochromatic colour loses its purity and becomes **desaturated**, the degree of saturation reducing as the level of overall reflection increases relative to the monochromatic colour.

All the above are *objective* assessments of colour and, apart from the weighting to balance the average variation of eye response over the spectrum, are independent of human perception. *Subjective* assessment has further complexities.

Perception of colour varies with light level. The light sensitive elements in the eye adjust to compensate for higher and lower levels of stimuli, as between day and night. The **photopic** response noted above holds for a brightly lit environment and allows distinctions to be made between the different colours across the spectrum.

When light levels drop to very low levels the eye's¹ response, now termed **scotopic**, is no longer broadly receptive. It is concentrated, with a sharply defined peak sensitivity,

in the blue area of the spectrum (approx. 500 nm wavelength). The ability to discriminate between colours disappears and monochromatic vision results. Between the two poles of photopic and scotopic response there is a gradual transition to lower light levels, and, as the general colour discrimination reduces, the blue sensitivity increases. This results in the phenomenon, termed the **Purkinje Effect** or **Shift**, where towards the lower light conditions (**mesopic** is the term for this intermediate range of response) blue objects appear progressively brighter than red ones.⁷ This Purkinje effect is a factor worth considering in viewing pictures. The low light levels in dimly lit chapels, or even in the dark workshops, of the 13th and 14th centuries mean that the viewing conditions in art galleries do not provide circumstances similar to those in which a panel was painted or normally viewed. The relative brightness of blues and reds varies to the extent that the compositional balance can be disturbed when viewing in bright modern galleries and must be kept in mind in any assessment.

Perception of colour also varies with context. The close proximity of two colours alters our assessment of each. In general the human visual system seeks to enhance differences. In the perception of tone, for example, a darker background enhances the apparent brightness of a lighter coloured patch. Similarly, in assessment of hue and saturation, the juxtaposition of one colour with another of similar hue tends to exaggerate the differences in hue, while that of two complementary colours tends to make each appear more saturated. The relative sizes and shapes of the adjacent colour samples also have effects on such variations.

Nevertheless, while all these variations are noticed there is still a considerable measure of continuity to be observed in our perception any object's colour. This, if not precisely stable in all circumstances, as in the above juxtapositions, remains generally recognisable. For instance, a daffodil appears yellow in a wide variety of

situations. This is true for a number of different lighting situations even where a variety of sources of illumination, say the white light of day or alternatively the orange cast of artificial light, provide for quite different ranges of colour, as objectively measured, being reflected from an object. This ability of the visual process to discount the colour of an illuminating source is termed **colour constancy**. The exact nature of the eye-brain process involved in this very effective compensation for changes in illumination and viewing conditions is only now being unravelled.⁸ As a broad generalisation, the eye/brain system accepts, or tries to accept, the aggregate of light presented to it as “white” and balances responses to achieve this.

One further important aspect of colour perception to be noted is that there are two principal modes of appearance, **surface colour** and **film colour**. Where a coloured area has defined edges and signs of texture, it is seen as a particular coloured object with surface colour. But where there is no discernible limiting edge or texture, as in the view of a sky through a window, the colour is not seen to have any particular location in space, and is film colour. The first is seen to be a passively illuminated item with some indication of its place in the viewed scene. The second, on the other hand, appears to be self luminous rather than illuminated, and as extending across the field of view at an indeterminate distance.

Earlier Theories and Attitudes to Light

As P.Hills pointed out, “We must beware of supposing there would be a direct influence of learned treatises on optics and the metaphysics of light on the workshop procedures of painters, since for them the imitation of earlier artistic models rather than reference to visual experience was the dominant influence.”⁹ But at the same time he continued, “Nevertheless, there appears to be a genuine congruence between those

workshop procedures and the view that the visual manifestation of light takes the form of *color* and of *splendor* or lustrous reflections.”¹⁰ Certainly there are other signs in painting of such congruence between the general concepts of the less learned painters, and those of the scholastic intellectuals. It is appropriate to look the nature of such similarities, and so both formal intellectual theory and workshop conventions practices are considered here even if there is little direct evidence of any direct communication between scholar and artist.

With work being largely in, or for, churches some indirect contact with current thinking and theory can be considered through commissioning clergy, particularly in large institutions like S.Francesco in Assisi. They could act as a bridge to contribute to some dissemination of such ideas even at a broadly simplified level. Assisi is perhaps a special case in this respect. As the Mother Church and central convent of the Franciscans some of its friars would have more opportunity than most to have contact with current thought. Some of the major scholars concerned in the 13th century considerations of Natural Philosophy and the development of Aristotelian ideas on this were Franciscans, Bacon and Pecham for instance, or, like Grosseteste, taught in Franciscan schools. Add to that Assisi’s central, indeed seminal, position in the development of mural painting, with leading contemporary artists and their workshops involved continually over decades, and there is obvious potential for some transfer of at least some general ideas to painters. Even if not directly communicated, the ideas could be induced by visual osmosis through constant contact with examples which conformed to scientific as well as theological orthodoxy. The corrective of disapproval by overseeing clergy and their need to satisfy their superiors would surely have avoided any accidental departures from accepted concepts being perpetuated and finding their way into common practice.

Beyond any such tenuous contacts, direct or indirect, there is another source of synchronism between theory and common attitudes and practices. The Church's acceptance of the scientific approach of Grosseteste, Bacon, *et al*, by the late Duecento is indicative of an new interest in the natural world, reflecting, and one would assume leading to, a change in the attitudes of society in general. In this, for the painter, the direct parallel, to increased objective scientific investigation, is increased attention being paid to observation in the painting process. This was advocated, albeit at the end of the 14th century, emphatically by Cennini in *Il Libro dell'Arte* "Mind you, the most perfect steersman that you can have, and the best helm, lie in the triumphal gateway of copying from nature."¹¹ In this it is inevitable that at least some intelligent artists, or craftsmen training and learning, in a workshop, would seek some convincing rationale based on observed nature to support recommended practices rather than dumbly and mechanically repeating these procedures. Some "popular science" would be adopted or discussed, and perpetuated, to justify the conventions followed. "Workshop theories" accepted and followed across the trade are manifest in pictures and can be compared with contemporary intellectual ideas.

Such parallel, but separate approaches, might lead to some compatibility between academic and artistic results, but not to any guaranteed identity of conclusions. Where the scholars and natural philosophers were intent on being intellectually consistent in developing their concepts the artists were more pragmatic in the evolution of graphic solutions. In this an equivocal attitude to repeating established recipes and following the evidence of the eye is apparent. Indeed, many of the works of painters of the period, show signs of tension between painters' obvious aspirations towards matching of natural events and the following of either previously accepted standards of procedure or any "workshop theories" which might have

paralleled the more intellectual ones. Such signs, illustrations of artists' equivocation, help track the technical "discussion" involved in the progression of painting. A close look at congruent and incongruent points is worthwhile, but not just to test for signs of artists' ideas being consistent with the general drift of contemporary theory. While points of congruence could point to some simple understanding of refined theories at artisan levels or illustrate parallel results arising from the artist's intuition or the philosopher's deliberation, inconsistencies are also of value. These can serve to show some alternative appreciation of visual aspects of our natural environment, which at times intuitively anticipate later theories rather than match current ones. At the same time such discrepancies, of course, must always be a reminder of the need for art to have its own non-scientific rules, or at least ones of a quite different *science*, if we use the term in its broader sense of the aggregation of knowledge and understanding in a particular field.

13th and 14th century light

Light was both physical and spiritual for the Duecento and Trecento thinker and artisan alike, though its physical side was assuming more importance, for both, in step with changing attitudes in Christianity. The metaphors of earlier religious traditions, both pagan and Judeo-Christian, had always inextricably tied the two together. Even when its physical side was being investigated, in the mid-13th century by Bishop Grosseteste, as he sought to bring ancient Aristotelian ideas together with the more Platonic Augustinian metaphysical doctrine of light, he was at pains to underline its divine source, considering it the first "corporeal form". Like Augustine he held "physical light to be the *analogy* of the spiritual light by which the mind received certain knowledge of the unchanging forms"¹² The analogy was faithfully retained

and reinforced but in addressing the physical world the priority changes with spiritual light being treated as analogous to physical light, “corporeal lux whose mathematical laws he held to underlie the operations of physical things”¹³ Western philosophic thinking in the second half of the 13th century was then starting to disentangle the understanding of the physical aspects of light from the metaphysical and the associated traditions of metaphor and superstition. A key factor in this reappraisal was the fruit of the works of Arab natural philosophers like Al-Kindi, Alhazen, Avicenna and Averroës, and their developments of ancient Greek learning, particularly Aristotle, which became available in translations to western scholars in the 13th century.¹⁴ There had been a prior and long established, Arabic and Islamic, pursuit of an understanding of the physical nature of our world.¹⁵ Additionally, in the late 12th and 13th centuries other Greek texts were being retrieved through translations into Latin. For example, the important 2nd century A.D. *Optica* or *De aspectibus* of Ptolemy, in the Aristotelian and Euclidean tradition, became available, albeit only in part, via the mid-twelfth century translation by Admiral Eugene of Sicily from an Arabic version of the Greek original. The influence of such learning, including the theories of light and vision, then became apparent in western European scholarship. Robert Grosseteste, who taught at the Franciscan school at Oxford from 1224-35 and then Albertus Magnus, a Dominican teaching in Paris in the late 1240’s and Cologne in the 1250’s, did much to reconcile the ideas of Aristotle with Christian theology. The most influential of the Arab natural philosophers was Alhazen (Ibn al-Haytham) and his conceptions colour the developing ideas of the mid to late 13th century which are reflected in the texts of Bacon, Pecham and Witelo.¹⁶ Through the 13th century Robert Grosseteste, then Roger Bacon followed by John Pecham developed concepts of light and vision. Subsequently Pecham’s *Perspectiva Communis* became the standard text book on

optical theory and light for the new universities of Europe.¹⁷ These scholars, though, tended to look at the matter in a detached physical way, clinically establishing the geometry of light, with limited attention paid to the visual perception of its effects. On the other hand, we can see painters looking for solutions more in keeping with their craft's requirements, and generating a different appreciation of light, based on subjective perception rather than on the physics of the scholars. Indications of recourse to observation as a tool in developing techniques are apparent. This might be seen in the progressive moves towards some of the practicalities of directional lighting like tilt shading being developed in painting, though such effects were hardly explored by some of their intellectual contemporaries, like Pecham and Bacon. The latter were more interested in light's effects on objects rather than the perceived effects from the viewer's point of view.

Physically light was accepted as being propagated in two ways. The primary manner of propagation had it travelling in straight lines through a medium. Beside this primary direct rectilinear propagation, there was considered to be a secondary and indirect transmission of light. Pecham and Bacon define and differentiate the two as *lux primaria et lux secundaria*. Pecham's version is: "... solar light emanates in two ways: by radiating directly — this is called primary light — and also by radiating directly in every direction outside the rays. By means of the latter, when the sun is situated over the horizon, a house is full of light, even though no solar rays enter it; and this is called secondary or accidental light."¹⁸

Concerning *lux primaria*, the nature of its propagation corresponds to our understanding as rectilinear radiation. It was only interrupted or diverted in its progress by reflection from an opaque object or being refracted by passing into a material of different density. Traditionally, and significantly, considering the divine

origin of light, there was seen to be a difference in the nature of light as it progressed through this process. At source, light was termed *lux*, but in transit in a medium it was *lumen*.¹⁹ But already when Bacon was writing this distinction was becoming blurred and the terms interchangeable.²⁰ That he did take liberties with orthodox ideas and usage may not have been entirely politic, for the reading of his work was forbidden in 1277 by the General of the Franciscans, Jerome Masci, subsequently Pope Nicholas IV, and Bacon himself was imprisoned, or at least detained, until just before his death in 1292.²¹

In 13th century thought the propagation of *lux secundaria* was seen to be quite different from that of *lux primaria*. Unfortunately in looking for an explanation for this Bacon, and his successors, did not have the benefit of Alhazen's extensive investigation and significant experiments into indirect light. We now have them, in A.I.Sabra's 1989 translation, but unfortunately the first three chapters of Book I were omitted in those Latin versions of Alhazen's *Perspectiva* available in the 13th century, and indeed in all texts right up to the present.²² The first chapter is a general preface and summarises ancient mathematicians' and natural philosophers' ideas on vision. Then chapter 2 sets out the conditions for vision. Critically the lost chapter 3 covers the properties of various kinds of light and the nature of their propagation. The concepts of rectilinear primary radiation and rectilinear propagation of 'accidental light' are discussed and Alhazen's comprehensive experiments reported. His convincing theory, with its firm support from detailed experimentation, found 'accidental light' to be further, but still rectilinear, diffuse *re-radiation* of primary illumination from various opaque surfaces.²³ The medieval conception of the propagation of *lux primaria* is closely akin to Alhazen's for 'primary lights'. But lacking his insight on indirect or 'accidental light' the later theorists sought their own

alternative but rather less persuasive, *lux secundaria*, version. The *lux secundaria* of 13th century thought was secondary in that it emanated accidentally and indeterminately in every direction *from along* the rays of primary light as this proceeds from a source.²⁴ The progress thereafter of the aggregate of this accidental light is seen to render it ubiquitous. Pecham describes its propagation then as “proceeding circumferentially”²⁵ Consequently it was not directly impeded in the same way that *lux primaria* was, and indeed he continues “nothing is totally deprived of transparency and cannot at any rate impede the circumfusion of secondary light.”²⁶ In this respect he defines shadows as being areas of diminished light, deprived of any primary light by an opaque obstruction and where secondary light is in some measure turned aside, though no agency for this is specified.

If these ideas are related to modern theories we find no difficulty in accepting the idea of the nature of primary radiation, *lux primaria*. This corresponds completely with our ideas of light travelling in straight lines. It offers the predictable directional shadowing one might expect with the interference of opaque material impeding light and producing shadows. As far as *lux secundaria* and its ubiquitous “circumferential” propagation is concerned this might be equated with our notion of ambient light, although the ‘lost’ theory of Alhazen, noted above, is clearly more consistent here. If the shadows produced by *lux primaria* being impeded are seen to be diluted, then modern thinking would see this as due, if not to a specific additional light source, to general ambient illumination, the aggregate of all the accidental reflections in the immediate environment (see above p.53). So that, concerning the depth of shadows, the modern equivalent is of the strength of a shadow being moderated, i.e. the contrast reduced, by its environment’s ambient light, or an additional source. Nonetheless, there is some inconsistency in the matter of whether shadows can or cannot arise with

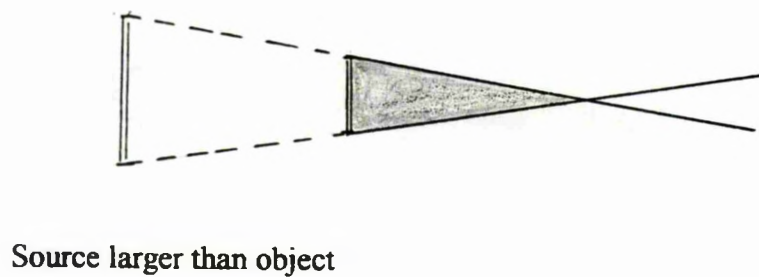
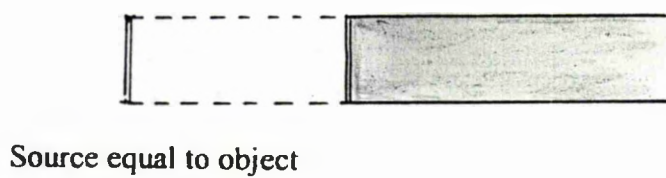
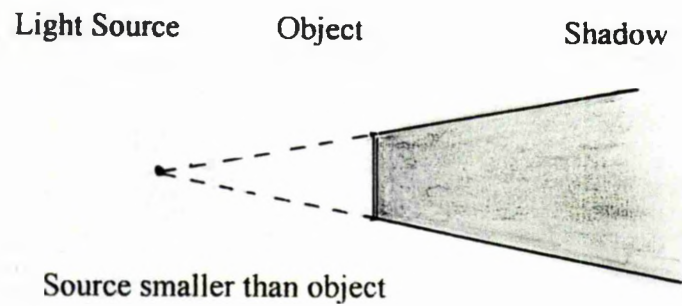


Fig. 6: Peckham's shadows as *Perspectiva Communis*, Prop. I.24

Note that these are umbrae : Peckham does not take account of penumbrae.

secondary light, for at another juncture Pecham makes the point that with two windows as channels of secondary, not primary, light, two separate shadows can be observed.²⁷

Deliberations on shadows are not taken much further. They only occupy three paragraphs, or propositions, in Pecham's *Perspectiva Communis*. Apart from the above observations on *lux primaria* and *secundaria* the other two propositions concern themselves with the relative sizes of a source of light and the object casting the shadow.²⁸ The substance of these is that a light source smaller than the obstructing object casts a shadow larger than the object, one larger than the object casts a smaller one, and with light and object of the same size the shadow matches this size [Fig.6]. The specification of these shadows in *Perspectiva Communis* is very much a matter of light or the absence of light, no attention is paid to penumbral effects. Also in these discourses there was no consideration of the incremental variations of light reflected from variously angled planes — a cheek for example — such as we could perceive as gradations of tone or tilt shading. This presumably results from an object based approach and assessment, as opposed to a viewer centred one. Such a tilting deviation, in the presentation of more or less area towards the incident light, collects commensurately more or less light for that given area. In consequence the perceived brightness of these surfaces also varies. It is worth returning to the point made on diffuse lambertian reflectors at this point (see above p.53). The angle from which any such plane is *viewed* makes no difference to its *apparent* brightness, but the angle from which it is illuminated does.

In the absence of such thoughts the incident light, primary and/or secondary, from a late medieval point of view merely discloses an object's form. While, as already noted, there is some ambiguity in Pecham's approach to the limitations of

secondary light, with its ability to produce shadows in some instances, such illumination could be considered as arriving from all directions indiscriminately. If we might extend the logic of this, all planes of an object are treated to the same amount of light. The variations of angles of planes, or of heights or depth, intrinsic to the object are not distinguished by the incident light. Thus light discloses but does not model. Some alternative reason is then needed to explain away the local variations in brightness which were seen to describe the appearance of the object. The explanation which satisfied scholars and painters alike revolved round the idea, accepted as axiomatic, that light becomes weaker as it travels, and this was interpreted to mean that more distant objects, or parts of them, will be *darker* than nearer ones. This was still the case in the mid 15th century when Alberti reports that distance, weakens the light rays to make the viewed surfaces darker, “più fusca” or “magis fuscam”.²⁹ The following of this concept, whether as a strategy in essaying illusions of depth in a picture in general, or in articulating detail to suggest local volume and size, and generally as a dependable “rule of thumb”, is apparent in Duecento and Trecento painting. It often presented artists with difficulties in reconciling its effects with observed phenomena, as they reached for naturalistic illusion. Sometimes the evidence of the eye and this convention appeared to correspond, but really much of the development, or rather problems in the development, of painting in the Duecento and Trecento centres on the conflict between a following of this “rule of thumb” and its rejection in turning to the observation of natural effects.

Light tones advance, dark tones recede

This idea as it affected painting had a long tradition reaching back into antiquity, and its possible origins and signs of its enduring influence through the centuries will be

addressed in a later chapter. As far as the 13th and 14th centuries are concerned scholastic theory, workshop convention and painting practice all combined to maintain its prevalence. The underlying theory is stated by Pecham in the *Perspectiva Communis*, Part I Proposition 18 : “The light of a single body is stronger at a near point than at a more remote point”³⁰ Its implications in terms of visual assessment are often recorded, over many centuries, in connection with writers seeking illustrations from painting. Thus a quite circular process, of art illustrating theory and theory confirming the painter’s practice, would seem to have helped perpetuate the convention in both. Early examples of the convention’s currency appear in the works of Pliny, Ptolemy, Longinus and Philoponos. Pliny stated “. . . all painters ordinarily execute in light colour the parts they wish to appear prominent and in dark those they wish to keep less obvious”; Ptolemy wrote “And therefore the painter, when he wishes to show those two figures by colours, makes that part he wishes to stand out a bright colour; but that part he wishes to appear concave (he makes) more concealed and darker”; Longinus pointed to painting effects where, “Though the highlights and shadows lie side by side in the same plane, yet the highlights spring immediately to the eye and seem not ~~to~~ only to stand out but to be actually much nearer”; Philoponos wrote “If you put white and black upon the same surface and then look at it from a distance, the white will always seem much nearer and the black further off.”³¹

The concept it is still invoked as a painting recipe by Theophilus, around 1100, and Cennini, around 1400. Theophilus, in writing of the use of controlled variations of light and dark colours wrote, “By this method, round and rectangular thrones are painted, drawings round borders, the trunks of tree with their branches, columns, round towers, seats and whatever you want to appear round. Arches upon columns in houses are also portrayed in the same way — but in one colour range, so that white is on the

inside and black on the outside. Round towers are painted in yellow ochre in such a way that there is a white brush stroke in the middle and, on either side, there spreads an extremely pale yellow ochre which gradually blends into a saffron colour until the last brush stroke but one, which has a little burnt ochre mixed with it..³² Such procedures are illustrated in works of Guido da Siena [Pl.141]. Here the nearer edges of a building are given highlights, while the farther ones are shaded, and round towers have a white central highlight to indicate their convex shape. In a later recording of the concept's place in Trecento workshop practice, Cennini writes, “and the further away you have to make the mountains look, the darker you make your colors; the nearer you are making them seem, the lighter you make the colors.”³³

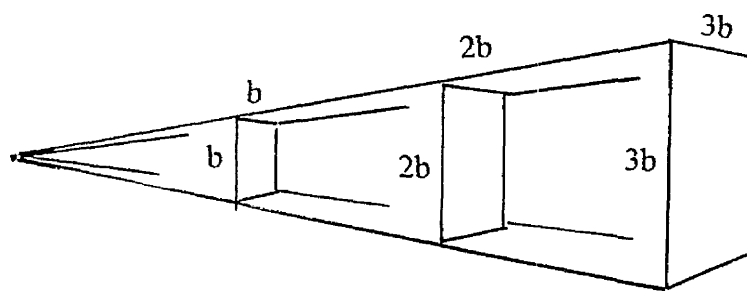
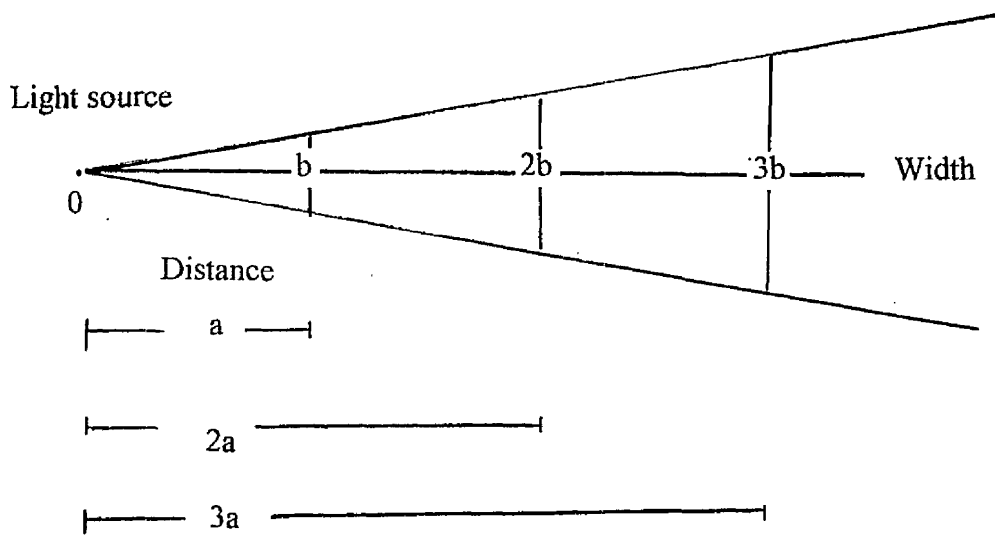
At the same time, in two learned commentaries concerning Aristotle's *de anima* written in the University of Paris, around the middle of the 14th century, there is detailed discussion of the differential perception of distances of parts of an object as assessed, or indeed deceived, by variations in brightness, with one even suggesting some gradations towards black or white as indications of incremental distance. Both cite painting practice as illustrations.³⁴

1: “And therefore in paintings because of the intension and remission of colours sometimes we judge a plane surface to be concave, or convex and standing out because the colour is more intense in one place than in the other.”³⁵

2: “I infer that it is possible to judge that something is concave which is in fact plane, for let there be some plane surface which towards the circumferential parts is coloured with a white colour and towards the middle is coloured with black colour — and according to how much more these parts are near the circumference, so much more are they white, and according to how much they are closer to the middle so much are they blacker . . . And therefore when painters wish to indicate on a plane surface that

some part of this surface should appear to stand out, they colour this part with a colour which has more light, like with white colour; however the part which they wish to appear to be depressed they colour with a colour which has less light and with a dark colour, like the colour of black.”³⁶

From this it would seem that scholars and artists were in agreement. This might have been true in the early Duecento, but was not universally true late in the century. Hillsides and mountains followed the working procedure recorded later by Cennini as did some detailing in architectural painting. But in two important ways actual practice departed from such ideas. Faces by the beginning of the 13th century were largely free of any rigid application and so appear more comfortably naturalistic as compromises were made between recipe and actual observation. Also at the same time the differential shading along a receding wall, as recommended by Theophilus, was ignored in general though some occasional leaning towards it does appear from time to time. The flat wall planes, for instance, painted in buildings of all the Assisi frescoes in the last decade of the Duecento, were painted as one tone with no gradation for distance. The early Lower Church *Life of St Francis* frescoes c.1255-1264, or their remnants, have no buildings to make any judgement on this, even if the slightly earlier panel paintings in S.Francesco c.1253, *St Francis and Four of his Miracles* [Pl.127] do show the tactic.³⁷ But Cimabue's Upper Church vaults, of the 1280s, despite their distressed state, give an indication that whiter tones, now inverted to black through the transformation of the white lead, were intensified to show nearer edges of the walls of Rome in the *Italia St Mark* web [Pl.161] as nearer than the un-accentuated distant parts of these.³⁸ In subsequent frescoes in Assisi, the *Life of St.Francis*, cycle for instance, such gradations were reserved for local variations in depth between overlapping surfaces, or for early attempts at shadow. This second departure from earlier practice



areas b^2 $4b^2$ $9b^2$

light 1 unit $\frac{1}{4}$ unit $\frac{1}{9}$ unit
per unit area per unit area per unit area

Fig. 7 Inverse square law

and premise was eventually codified, not by Cennini, but by Alberti when he writes, “remember that on a *flat* plane the colour remains uniform in every place; in the *concave and spherical* planes the colour takes variations.”³⁹

From a 20th century point of view it is possible to see the concept of “light tones indicating proximity and dark tones indicating distance” as justified, in some situations. It is not, however, in any way a general law, to be used in all situations, though it appears to be viable in particular cases. The proposition that “light loses strength as it is propagated” is basically true. As it radiates the light flux is spread over an increasing area so that light intensity *per unit area* reduces as it travels outwards, even in a transparent medium. Since it is a matter of increasing area, rather than just distance, the reduction follows a square law. That is, doubling the distance gives quarter the light, trebling it gives a ninth [Fig.7]. The perceived brightness of an object is dependent either on its own light producing properties, as for a candle or a light bulb, or on its passive reflecting properties, when it itself is subject to illumination. For this second, passive object, the illumination falling on it is inversely proportional to its distance from the source of light, following the square law outlined above. In a simple arrangement, if the lamp alongside the artist’s working panel, or a window behind him, also provides illumination for his subject matter, then illumination for that subject reduces as it moves away into the distance of the room, as the window light, or lamplight falling on it reduces. Additionally, if the painter looks to left or right the wall areas apparently shade off into the depth of the studio. A photograph [Fig.8, facing page 72] can illustrate this progressive reduction in light along receding walls or floor though here there is also the matter of angle of incidence as the receding walls accept light at progressively shallower angles to accentuate the perceived reduction — the far wall reflects more than the distant ends of the side walls for this reason.



Fig. 8: Arena Chapel, General View.

Although the perceived brightness reduces here as a consequence of distance from the light source, not distance from the artist, it might seem that in “controlled” and reproducible situations, subject brightness fails with distance. For interiors the theory could seem valid and adherence to the rule of thumb, requiring increased pictorial depth to be shown in darker tones, appeared justified. It is also true, in part, for night scenes, where local artificial sources, such as firelight, lamps or torches, provide the light. Such limited and local lighting means that there are noticeable differences in illumination with minor changes in distances, unlike open daylight where any incident light is relatively constant due to our distance from the sun.⁴⁰ We can, then, find that a “nocturnal” or “interior” lighting perspective works in accordance with antique and Trecento theories and workshop practice. The enduring repetition and ready acceptance of this theme of brightness advancing as a *general law* of perception and as a practical rule in painting, continues even today.⁴¹ It seems to follow readily from our experience of interior and night circumstances.

While theory and assumptions would seem to be justified in a “controlled” studio situation there are quite obvious difficulties in considering scenes in open daylight. The same basic light transmission laws still apply, but other factors come into play. Our atmosphere is not quite a transparent medium. It has dust and moisture particles present and these interfere with, and can reduce, direct transmission of light, even in good conditions. This occurs differentially, for small particles, including the molecules of the atmosphere’s gases, with dimensions close to the wavelength of blue light radiation, refract and disperse the blue content of the sun’s radiation more than the other constituent colours of the spectrum, to give a golden sun and a blue sky. Dispersion also provides a diffuse, bluish, overall veiling element which lifts both dark and light tones of the local colours in the distant scene. Consequently the normal result

for our perception of distant objects in daylight is that, while there might a marginal inhibition of direct transmission of light over distance, we do not observe so much a reduction in brightness as a reduction in contrast, together with a blue bias. Such effects are greatly modified and exaggerated where the weather becomes misty. Then the moisture particles in the heavier atmosphere become large enough to disperse, and interfere with, all the colours of the spectrum, and the denser intervening air, as mist, can give us a more emphatic demonstration of this reduction of contrast, but with retention of general brightness. In this case there is little or no bias towards blue, since all the spectrum's colours are now involved in the veiling process.

The appreciation of these varied effects of atmospherically reduced contrast and general softening, was not a factor in Italian painting before the 15th century when Leonardo da Vinci would term it *aerial perspective*.⁴² Without coherent theories of vision and light to explain them the vagaries of climate, mist, rain or dust, and the light variations throughout even a normal day, made their illusionistic depiction problematic. They were in effect ignored. The idea that increasing distance meant darkness, apparently justified in “controlled” studio conditions, continued to control the painting of open exteriors as well as interiors.

The relationship of the perception of brightness and distance can be considered in other ways. As it is assessed at various distances from a light source, either an active one like a lamp or a passive reflector like a piece of white board, the value of light reduces as the square of the distances involved. However, as the angle subtended at the eye of a viewer by the object, following these assessment points, also reduces in step with this, the area of the object as it is viewed on the retina also reduces. In consequence any distance related reduction in light is matched by its having to stimulate a commensurately smaller patch of retina, and the effective brightness, as

perceived, is maintained. In modern terms this is known as the *invariance of specific intensity*. To experience this we can return to daylight viewing. Where any masking haze of the atmosphere is absent, as in a clear day, or at moderate distances where it has little or no effect, one will find, consistent with this invariance, that an object viewed at *any distance* appears *equally bright*. The distance from the viewer has no bearing on this and, as already noted, with our great distance from the sun any changes in incident light over any likely increments of distance are infinitesimal.⁴³

Such apparent constancy, at variance with “orthodoxy” was, nevertheless, not unnoticed in the early Trecento. We find indications of this in the *Divine Comedy*. In *Paradiso*, Canto II, Beatrice discusses the light and dark markings on the Moon with Dante.⁴⁴ One possible explanation of the apparent differences in brightness there, is suggested as being simply due to different distances in the light’s path as it is reflected from different levels of the moon’s surface,

“Now thou wilt say that the ray shows dim there more than in other parts from being reflected there farther back ,”⁴⁵

Then Beatrice suggests an experiment to demonstrate the fallacy of this explanation.

“Take three mirrors and put two of them at an equal distance from thee, and let the other, farther off, meet thy eyes between the first two; then, turned to them, have a light set behind thy back which kindles the three mirrors and returns to thee struck back by them all.”⁴⁶

By means of these mirrors, reflecting the same light at various distances, the experiment sets out to show that the *perceived* brightness of a lamp at differing distances appears to be constant. Dante ends by having Beatrice say:

“Although the light seen farthest off is not of the same size, thou wilt see then that it must shine with equal brightness.”⁴⁷

This, seemingly, contradicts the belief that light fails with distance.

The results here are assessed subjectively. Modern facilities allow us to offer a reasonable demonstration of Dante's suggested experiment and to show objectively that his subjective assessment of the apparent brightness was correct. The experiment is reported in Appendix I.

Dante, while intent here on demonstrating the inherent integrity of light and so divine grace, clearly reflects some of the thoughts and observations of other intelligent minds of this period. He was writing, in Padua, during the second decade of the 14th century, when Pecham's *Perspectiva Communis* was already being cited by other authors.⁴⁸ The simplistic extension of its Proposition I. 18, to indicate that more distant objects would be perceived as darker, was clearly a generally accepted notion, as the 1350 Paris University commentaries (noted above p.69) serve to prove. However these ideas evidently had not been unchallenged and it, or at least these anomalies associated with it, clearly had been subject to some discussion.

Light from above

Apart from the accepted concept that lighter and darker tones indicate respectively prominence and recession there is another, unwritten, but significant factor which has a bearing on the way light is seen and portrayed. This is the expectation that light comes from above. This is not so much a matter of physics as one of psychology. It might arise through everyday experience of environment, with natural light always being from the sky, and our use of elevated artificial light in our homes. But even if these are common factors heightening our awareness, it could well arise from a long term inherited reaction built into our perceptive processes.⁴⁹

One obvious example of the strong tendency for us to perceive things as lit from above occurs regularly for anyone interested in Trecento painting. Taddeo Gaddi's fresco of *The Annunciation to the Shepherds* in the Baroncelli Chapel with its adventurous treatment, inventing a divine radiance, is a frequent illustration in books [Pl.259]. Invariably such an illustration has, half way up on the right, a section where a large piece of plaster has become detached leaving a sizeable indentation. To provide light for photography it was convenient and practical, given the geography of the Chapel [Pl.258], to illuminate the wall from a temporary lamp, on a floor stand *just below* and to the right of the fresco. The resulting shadows and highlights around the depression are read, in the illustration, as the edges of a projection rather than the limits of a shallow recess. The effects is further underlined when read with the sense of lighting from above, which Taddeo Gaddi implies in his painting. But, nevertheless, even when viewed in isolation in such a photograph it is difficult not to see this blemish as other than a *projection* lit from above.

Many other creatures beside man, including very primitive ones, exhibit responses suggesting that such sensitivity is a quite basic part of animal reaction and is often a physical part of animal make-up.⁵⁰ It is a response which we, in the 20th century, have in common with people in the Duecento, Trecento, and also, for that matter, with our predecessors in antiquity. While some inhibitions and pre-dispositions are subject to our cultural circumstances there are other more basic responses which, like this, appear to be innate or are learned early on from the physical rather than the cultural environment. Modern psychologists have considered and are still investigating this matter, but it was not touched on or written about by early theorists. Intriguingly though, Cennini comes close to raising it when, in writing of depicting fish, he advises the painter to be, "shading . . . the shadows always on

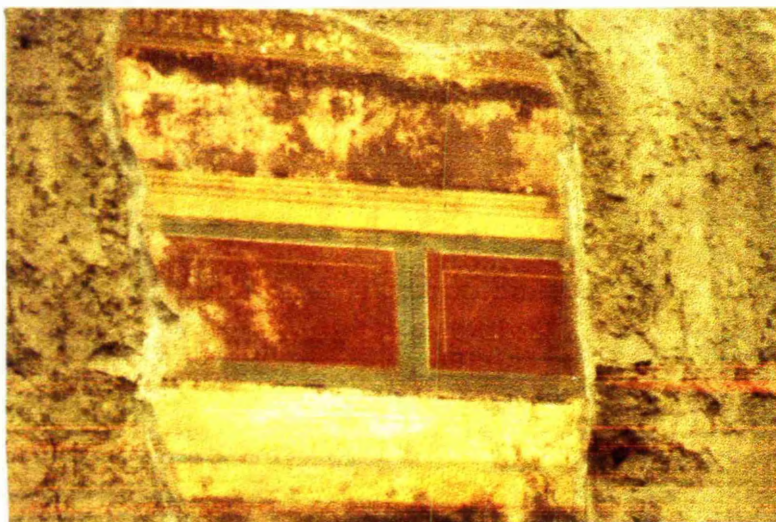


Fig. 9: Fictive Masonry, late 1st century B.C.
Rome, Capitoline, House of Augustus.



Fig. 10: Microsoft Computer Display, Toolbar Switch Indication.

their backs; bearing in mind that fish, and in general all irrational animals, ought to have the dark part on top and the light underneath.”⁵¹

It may not have been written about and positively discussed, but the consequences of an expectation that light comes consistently from above eye level, are implicit in virtually all early paintings. With no textual sources, direct or indirect, antique or medieval, in this area any evidence comes as inference from the images themselves. Obvious examples of antique response are clear in works of the Pompeii First and Second Styles, from the late 2nd or early 1st centuries B.C. [Fig.9]. The upper edges of fictive building blocks are picked out in lighter tones than the main face, while the lower edges are painted in noticeably darker ones. But then it is apparent that such a response is still part of habitual modern perception processes. The fictive switches of the near ubiquitous Microsoft Windows screen display exactly the same device [Fig.10] to show projection and recession. A rectangle of mid grey, on mid grey, denotes a switch. Its outline is traced in a lighter tone on the upper and left side. The lower and right sides have darker lines. The intention is to offer the semblance of a raised button lit from above and from the left. On selecting the switch these outlines reverse in tone to tell of a recess with its upper and left sides shadowed and its lower edges lit. As far as the Duecento and Trecento are concerned, quite identical treatments show the same graphic solutions are used for rusticated wall blocks in Assisi [Pl.200] and Arena Chapel frescoes or for panelling in the Duccio's *Maestà* [Pl.293].

While it had no formal endorsement in texts the priority given to this feeling for light from above was patently an important factor in the 13th and 14th century painter's craft. It is, though, in no way part of the “light advances” theory and indeed it often contradicts it. In many situations the idea of light from above actually takes precedence over the concept of dark tones offering distance and light ones showing



Fig. 11 : *Mural*, 1st century B.C.
From the Cubiculum of the Villa of P.Fannius Sinistor, Boscoreale,
New York, Metropolitan Museum.

proximity. No matter how emphatically a sense of lighting direction is attempted the evidence for light from above appears more insistent still. On stairs steps are always painted lighter than the risers between them [Pl.320]. This particular illustration additionally shows a contrast between the lower and upper steps, the latter having dark lines added to locally “push back” the faces of the upper steps where the light upper surface of the steps is lost to view. The brightening of all open horizontal surfaces occurs in many painted situations : table tops, or the upper surfaces of a dais or throne are examples. These are all shown as substantially lighter than any of their sides. For faces the idea of light from above is accepted without question and, apart from some very isolated exceptions, is implicit in each and every painting. Cennini writes, on painting faces, “start shading *under* the chin . . . the *under* side of the mouth . . . *under* the nose . . . *under* the eyebrows.”⁵²

Brightening of the Leading Edges of Horizontal Planes

A situation where the two controlling ideas, one of light being from above and the other of lighter tones being closer than darker ones, come together is to be found regularly in landscape painting. Here there is, at first sight, another detailed and localised manifestation of the concept of lighter tones representing advance or projection. In these the near edges of rock or mountain detail are given a lighter treatment to tell of the abrupt projection of the front edge of an upper receding plane. We find it in Assisi frescoes [Pl.207], Duccio’s *Maestà*, or in Giotto’s Arena Chapel, even if it is less obvious there. But then such depiction of rugged terrain, picking out and signalling the leading edge of a higher receding plane has a very long history. We can discern its use in some antique paintings [Fig.11] It is used in the landscapes of 6th century mosaics in Ravenna [Pl.50]. It became a very prominent feature of Byzantine

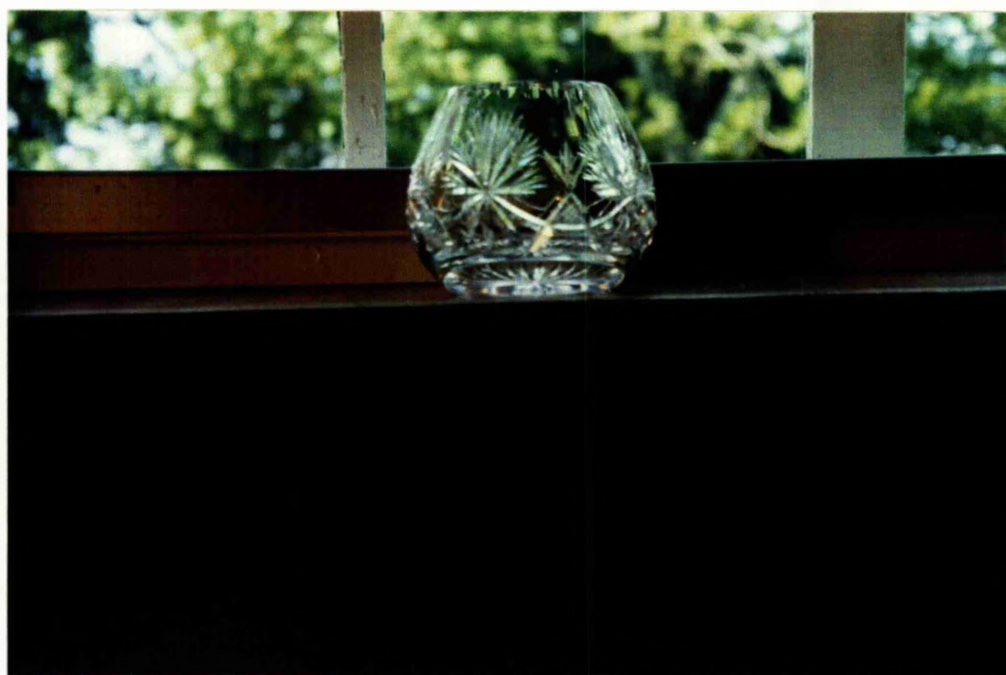


Fig. 12: Photograph, Window Sill.

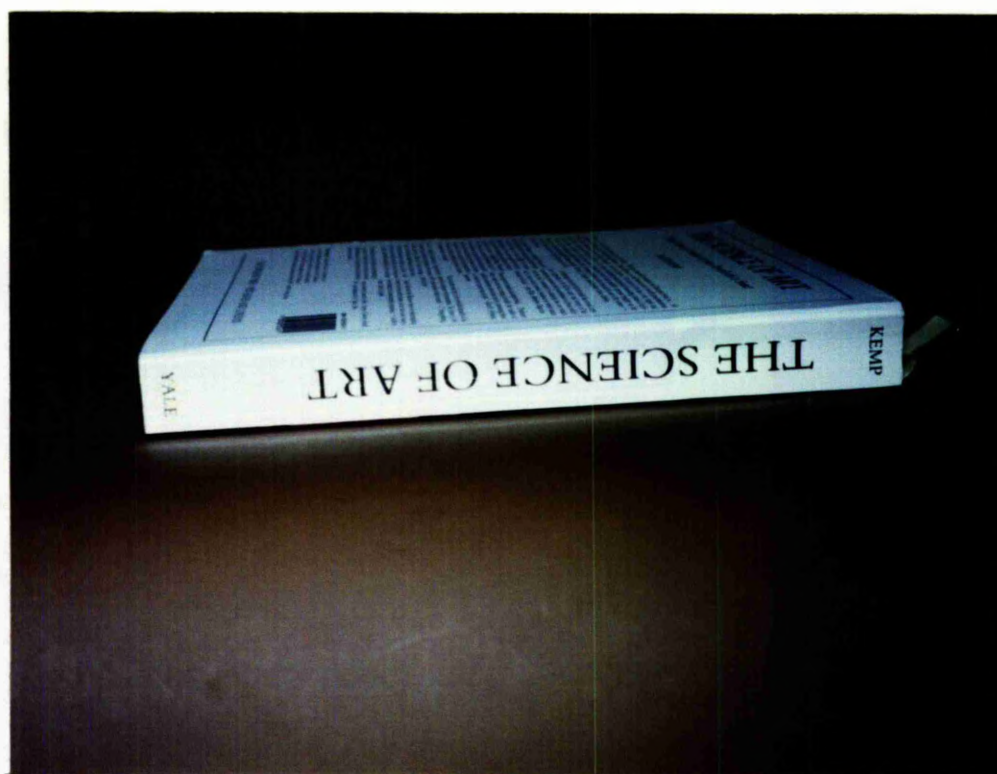


Fig. 13: Photograph, Book.

paintings and illustrations where in standardised form it continued on into the 15th and 16th centuries. One particularly important series of pictures carried it constantly. It is employed to show the rugged edges of the cave of the *Nativity* [Pl.78]. Such treatment was copied very faithfully through into the late Duecento where, for example, Cavallini followed both form and technique in his Sta.Maria in Trastevere apse mosaics [Pl.174]. It also features in, Byzantine inspired, Bolognese manuscript painting in the late Duecento. The Gerona Master [Pl.111] shows mountainous backgrounds with pronounced leading edges in the Passion scenes.

The employment of this device in all the above tends to appear, to modern eyes, as very contrived. But it could have some justifiable basis in the observation of natural phenomena. We can readily discern its occurrence, or something similar, in a number of situations. Look, for example, at a gloss painted window sill situated just below eye level [Fig.12]. The transition from horizontal surface to the short vertical face presented in our direction will, more often than not, display a highlight where the surface plane passes through an angle which directs light directly in our direction. Or yet again turn away from the window and look at the spine of a shiny paperback held horizontally to the front and again, as for normal viewing, just below eye level [Fig.13]. Once more the transition between the flat surfaces is articulated by a sharp horizontal highlight. Moreover in this second case the flat surface of the spine will appear lighter than the receding cover of the book, tending to show a reassuring consistency of this local effect with the general convention of the recession of darker tones. This effect is emphasised by the shiny nature of glossy paints or materials, but the same effect occurs, in some measure, in any similar transition. Though with more matt materials it is less obvious, even slight textural sheen can give the observer an

impression of an accentuated bright step at the leading edge of an abrupt transition from a vertical to a horizontal plane.

There is, nonetheless, one peculiarity in the translation of this effect into paintings and manuscript illumination, which already had become common in antiquity, and seems to have become universal by the 13th century. It was positively depicted as an extended attribute of the *upper surface*, not just an element, which closer observation shows was confined to the transition between the two planes. Some earlier examples, as in various 5th and 6th century mosaics of Ravenna, offer a range of presentations showing different manifestations of these effects. The *Good Shepherd* [Pl.49] in Galla Placidia's mausoleum has an essentially flat, lighter, treatment of the upper surfaces of the rocky foreground, though the overall effect is realised with mixed gold and white tesserae and an extra line of gold is found on the front edge. Of S. Vitale's mosaics some have the bright accents limited to the transition, and distinct from the upper surface, while others show these expanding into the top surface. The S. Vitale Presbytery apse vault *Christ Crowning S. Vitale* [Pl.57] illustrates the first, and the adjacent Presbytery walls showing the *Life of Abraham* [Pl.56] demonstrate the second. The latter version we see followed in Italian Duecento and Trecento works : Cavallini's Sta. Maria in Trastevere *Nativity* [Pl.174], Duccio's *Temptation on the Mount* [Pl.296], or Ambrogio Lorenzetti's landscape of *The City of Good Government* [Pl.328]. It seems obvious that this results from the conflation of two notions, of light from above and of lighter tones indicating prominence, into one standard pattern. In all cases the flat upper planes of the rocky promontories are each lighter than their front vertical faces, just as top lighting might suggest. They are also to be seen to be receding into the picture space, and so become progressively darker away from the frontal edge.

Colour and Colour Conventions

The attitudes to colour and its relationship to light in the 13th and 14th centuries are different from ours so here again a balancing act is required. An understanding of what we now see as colour (see pp.54-58 above) is useful, but once more our knowledge has to be used not simply as an assessment of pictures. It must also be an aid to the appreciation of early ideas, constraints and habits of the period's workers so that developments in the Duecento and Trecento might be seen in a more sympathetic context. While Duecento and Trecento artists' eyes responded in the same way as ours do, their understanding of the underlying visual processes was different from ours. There was no analytic comprehension of the ability to stimulate the sensations of different colours from mixtures of common lighting constituents. But there was an understanding of synthetic creation by mixing, confirmed empirically every day in the workshop.⁵³ These results were seen as a combination of the materials, the pigments, which were used, and not the mixing of reflected light from them. Colour was a much more object-based concept. It was intrinsic to the material of the object as disclosed by illumination. While some sense of modification was noticed in different lights, daylight or lamp light for example, it was judged that the perceived colour was largely independent of the nature of the illuminating light, given that there was sufficient light for disclosure. Indeed, one aspect of visual perception which we only now are coming to fully understand, that of *colour constancy* (see pp.57-58 above), might well have helped confirmed them in such beliefs. Here the apparent colour of an item, in the main, continues to be recognisable, though its tonal value, darkness or brightness, might vary in different lights. Whether it is viewed in daylight, lamplight or in partial shadow, a yellow daffodil will appear yellow. The eye and brain system generally

manages to compensate for changes in the colour of the light falling on the subject viewed. Thus, as far as the Duecento and Trecento viewer was concerned, colour remained an inherent attribute of an object, and was not a direct function of light. This applied also to the colouring agents, pigments, used to represent subjects, for these were objects too, materials broken up small enough to be carried in a suitable medium to panel or wall. As a result the various pigments brought with them many other associations directly related to the materials themselves. Particular choices then were based not purely on descriptive properties, but additionally on the interrelated factors of cost and aesthetics, while, at the same time, durability was also important. The value of a painting was perceived as much, or more, in the quality of its materials as in that of its artistic execution.⁵⁴ The exhibition of conspicuous consumption, along with appropriateness for both the reverence of holy subjects depicted, and the hallowed location intended, contributed to this. The overt display of intrinsic material value was an essential factor in the perceived beauty of any work. Beyond that, the habitual use of some costly materials for important personages led to some iconographic connotations. For example, the Virgin Mary's cloak acquired the expensive ultramarine as a continuing token of her exalted status. Thus, if a substance was used, especially if it were costly, its integrity was expected to show in its purity and to be reflected in its clarity. Intense saturated colours, particularly, blues and reds, are a noticeable feature in painting of the period.⁵⁵

Gold and silver were, in this respect, treated both as colours and as precious constituents. This was perfectly consistent with the representative rather than descriptive employment of pigments and materials. But while gold represented itself in depiction of objects within the scene, it was also iconographically and symbolically important in tokens of divine respect. Its regular use for haloes demonstrates this, but

a particularly obvious manifestation of its use in this way was chrysography. For this the highlights on the garment of a Holy personage were depicted in a stylised linear manner using gold. Following Byzantine precedents this appeared in Italian painting around 1260 and had a wide and enduring currency until well into the Trecento when it can be seen in Barnaba da Modena's work in the late 1360's. Beyond these uses gold clearly had, as the overall background and surrounding finish in panel works, the effect of imitating the nature of the more expensive *repoussé* precious metal decorative panels previously found on prestigious altars. Indeed its role in this respect was emphasised by both punch work and *pastiglia* effects to provide deliberate localised sharp, that is, specular, reflections. Gold, with its enduring mirror-like surface had, when treated as a pigment, inherent difficulties in any attempts at illusion. Its transitory brightness from some angles, when the spectator's eye catches maximum reflection would overpower any other light tones, while if turned even slightly or viewed from another alternative angle it could appear very dark. Later Alberti complains of just that. While noting that some painters who used gold claimed it conferred "majesty", he pointed out that "some planes shine where they ought to be dark and are dark where they ought to be light".⁵⁶ In the Duecento or Trecento both silver and gold were used to represent themselves and only a few attempts were made to imitate their nature by depiction. Duccio's *Maestà* was, surprisingly, a good example of such an attempt when he elected to provide the helmets of soldiers with painted illusions of bright metal while many others, including Giotto, presented actual metal. The passage of time shows the enduring illusion of Duccio's guards' helmets as opposed to the now blackened ones in the Arena Chapel. The use of gold and silver, and chrysography, will be covered more fully in a later chapter on the depiction of fabrics and materials (see pp.265-277).

One consequence of the discriminating and very controlled use of pigments, each with its own characteristic properties of colour and tonal value, is a traditionally preferred medieval usage, observed up to the 13th and 14th centuries, which John Shearman, in 1957, suggested might be called *absolute colour*.⁵⁷ This preserved the integrity of the selected colour for each individual shape, for example a robe, within its formal boundaries and determined its local treatment in terms of internal shading. The modelling was self-contained within the form of each object. Its colour is not seen to be affected, perhaps corrupted is a better term consistent with period attitudes, by the reporting of accidental reflections from adjacent objects. Neither has it any interference through shadowing from its neighbours. The Virgin's ultramarine robe, in many pictures, or the vermilion of that of a saint might serve to illustrate this autonomy. In the main the modelling code which Cennini advocates for drapery tends to bear this out.⁵⁸ The areas of deepest tones are depicted in pure pigment and his advice avoids contaminating this with darker neutral colours like black. The ability to offer the semblance of the play of light was then dependent on the progressive desaturation of the pure colour by adding white in controlled steps. The deepest tone was the clean unadulterated pigment, and any modelling relied on the incrementally lighter tints rising up to pure white for highlights. Such a system has been termed "up modelling". An alternative "down modelling" approach,⁵⁹ as later outlined by Alberti, starts with the pure pigment, as the characteristic colour of the form, and uses dark neutral additions to model those sides turned away from the light while lighter additions are limited to the lit side.⁶⁰ Cennini claimed to write of good Trecento procedures, but actual observation of Trecento practice shows a rather varied use of techniques with many signs of mixed pigments and dark neutral shading. Works by early Trecento Sienese masters can show considerable use of the addition of neutral

pigments, other than white, to assist modelling. Duccio's *Maestà's* many narrative panels rely very much on "down modelling" in the light and shade treatment of robes. His Madonna in the London National Gallery *Virgin and Child with Saints* [Pl.274], even has pure carbon black employed to model her ultramarine robe.⁶¹ At the same time Ugolino di Nerio for the 1324-5 *Santa Croce Altarpiece* [Pl.301] makes effective use of mixed pigments for the robes in this.⁶²

A further consequence of this tendency to protect the clarity of colour in isolated forms is seen in a direction that composition could take. J.Shearman discerned a system he called *isochromatism*.⁶³ The distribution of forms and their internal colour becomes important for the overall effect of a painting. The balance and distribution of colour, and implicitly tone, in a composition comprising these discrete islands of pigment is a major concern of the artist. In this respect we can observe interestingly different choices made in Cimabue's *Sta.Trinita Madonna* [Pl.160] and in Duccio's *Rucellai Madonna* [Pl.270]. The former has a symmetrical balance for the colouring of the angels' robes, those on the left mirroring precisely the tones and colours of the ones on the right, while the latter shows a dynamic balance alternating colours across the tableau of angels. Organising pictures in this way further accentuates the need to keep the treatments of each unit separate. The individual elements, a figure and its robe for instance, were then autonomous, and not just in colour, for tonal value was an element of colour/pigment. They are locally self sufficient in tonal modelling.

While the preservation of pure colours, as desirable and brilliantly intense elements, was an ideal, and any physical compounding of these avoided as much as possible, some necessary mixtures of pigments do feature in Cennini's handbook. Flesh tones were mixed. Also some non-spectral colours, such as purple or brown, had to be concocted. Additionally the few directly available greens needed augmenting

through the mixture of blues and yellows.⁶⁴ A method, termed *cangiante*, was also employed to extend the tonal range of the limited selection of pure pigments available. Some colours, ultramarine for one, had inherently dark characteristics while others, yellow for example, had lighter tonal values (see p.56 above). By employing different pigments, essentially unmixed, within the same piece of drapery the respective tonal values could complement one another to provide a semblance of lighting variation which was further enhanced by colour contrast. This was seen to suggest the changeable shot effects in fabrics and so was called *cangiante*.⁶⁵ Though an essentially contrived and anti-naturalistic ploy it helped extend the limited palette of the period. Its usage will be covered in more detail in Chapter 5 pp.250 ff.

Red-Green and Local Red Usage

A similar use of contrasting colours was involved in another traditional procedure, recommended in Cennini's *Il Libro dell'Arte* when he indicates the preferred way to paint and model faces.⁶⁶ The flesh colours here, the pink tints of red, red lead, vermilion or carmine are complemented by green terre-verte. The latter is used as preparatory under-painting to provide a modelled base in fresco, and also a flat base in tempera, for the finished gradations of the warmer colours. It is allowed to show through some of the upper layers, and should, according to Cennini, be left to show itself in the deepest points of shadows.⁶⁷ The technique was not universal in Trecento Italian painting but Cennini notes, and dismisses, other procedures where the starting point was the warmer flesh colours rather than the green earth.⁶⁸ Nevertheless, this complementary red-green stratagem was already an established treatment in the 13th century, though the time and place of its origins are obscure.



Fig. 14: *Archangel*, detached fresco, c.1224,
Thessalonica, Hagia Sophia.

There are different forms of its application. The Cennini version, for painting, benefits from the building up of various layers of paint to combine the pigments through having the green shine through the upper layers as well as having the two alongside each other. Some earlier painting in different areas also follows this procedure, as a c.1224 mural with faded flesh colours from Hagia Sophia in Thessalonika shows [Fig.14]. Other later Duecento examples, St.Peter in the Sancta Sanctorum for instance [Pl.146], show the contrasting green pigment added to the surface later, as part of the final modelling, rather than it showing through from an underlying base of preliminary painting.

While some indication of green as underpainting or for flesh shadows does appear in early manuscripts, for example in the 867-86 Homilies of Gregory of Nazianzus [Pl.103] and continues in a number of subsequent manuscripts, it is difficult to trace any occurrence of this tactic prior to this in painting. The problems of survival, or rather non survival, make it difficult. There are suggestions that green underpainting might be seen in antique paintings, with Pompeii frescoes cited as examples.⁶⁹ However, recent close scrutiny of these does not bear this out, with no sign of the effect apparent in any flesh tones of paintings currently in the National Archaeological Museum at Naples.⁷⁰ While non occurrence can not be proved, a fresco of *Iphigenia* [Pl.37] here is a striking example of clean flesh execution with no traces of any green preparation. What little we have of later periods' painting similarly does not carry indications of the technique. None of the many mummy portraits from Roman Egypt from the 2nd and 3rd centuries display it, a. c.150-180 *Portrait of a Bearded Man* [Pl.40], is a typical example. It is also absent in the 6th century icons which survived in St.Catherine's Sinai. Here a 6th century *Christ* [Pl.112] might serve as illustration.



Fig. 15: *Virgin and Child with Saint*, mosaic probably 11th century,
Rome, Sta.Prassede, S.Zenone Chapel.

A parallel red-green usage occurs in mosaics. But here without the multi-layer process of over-painting, it is necessary to make a positive choice of tessera colour for the final surface effect. Greens, some muted and some quite strident in pure saturated form, are apparent in mosaic facial shading. *St. Peter* [Pl.96] is representative of a number of surviving fragments from the c.1220 S.Paolo fuori le Mura apse. These faces have subtle, quite drab, greens in their shading with pronounced reds used for fine local detailing and outlines. Here the scheme employed is not entirely compatible with that described, nearly 200 years later, by Cennini for painting. The flesh colours are modelled, on the side of the face away from the light, with light tones dropping in tone through variants of pink and peach to meet a limiting pure red line of tesserae serving as the final tone and also as the limiting outline of the face. On the side of the face open to the light the flesh colourings shade off and meet drab green tesserae to match the tilt shading of those surfaces lit, but angled away from the light.

In mosaic, as in painting, origins are obscure. A few indications of earlier usage survive. A small mosaic in the S.Zenone Chapel of Sta.Prassede [Fig.15], probably from the 11th century, but possibly from the 9th,⁷¹ shows pronounced blue-green shadows in a rather more simplified and linear form. These balance similarly sharply defined red accents. A still earlier Madonna, c.708, from the Oratory of Old St Peter's has a definite, if minimal green chin shadow.⁷² These, however, are isolated instances of the employment of green as a contrast to the reds and pinks characteristic of flesh colouring. Other surviving mosaics are clear of its use in this way. Noticeably, other 9th century mosaics in the S.Zenone chapel, and elsewhere in Sta.Prassede, show facial features picked out in orange with brown lines as token shading but no trace of green. Similarly, some earlier mosaics might have signs of modelling, or accenting in reds and pinks, or variations of these, but have no recourse to any green suggestions of



Fig. 16: *Mosaic Fragment*, 1st century A.D.
Thessalonica, Archaeological Museum.

shadows. For example, the 5th and 6th century mosaics of Ravenna [Pl.59] make no such use of green in facial depiction, and surviving antique mosaics show no indication of green tesserae in flesh modelling. Graded modelling in flesh colours from a purer or deeper red through pinks to white is the technique found generally in surviving Roman mosaics [Fig.16], just as was the case for painting.

While the green contrast to red might have been a later invention, another colouristic device, with an earlier and longer history, made local use of pure reds. This employed just isolated red or similarly coloured tesserae. Such touches were not used as outline or essential tonal elements in shading but as local colour tokens in the mid tones. Where the sense of complementary colours offering enhanced contrast was the rationale behind the red/green of the first mode, here the visual phenomenon being pressed into service was optical mixing. This is the mixing, in the eye, of small units of colour which cannot be individually resolved when seen at a distance. An illustration of very refined use of this technique is to be found in a spectacular survival from the apse of the 4th century, Constantinian, St Peter's. The elegant modelling of this depiction of St Paul [Pl.43] shows a consciously sophisticated use of techniques which rely on the eye's ability to integrate an array of colours and tones. This optical mixing prompts comparisons with the pointillist techniques of the late nineteenth century and often attracts an "impressionist" tag.⁷³ Noticeable within this technique is the strategic placing of discrete touches of local colour, including red, which let these merge, at distance, with adjacent tesserae to offer a composite effect, but still, at the same time, suggest the characteristic local colour of the face. The technique is not used as subtly as this in any later surviving examples. In the otherwise impressive 5th and 6th century Ravenna faces [Pl.59] it is obvious and in places intrusive. A fragment



Fig. 17: *St. Paul*,
fragment of *Leo's Triclinium*,
mosaic, c.800,
Rome, Vatican Library.



Fig. 18 : Paolo Veneziano,
St. Peter,
detail of *Pala d'Oro*,
tempera, 1345,
Venice, S. Marco.

from Leo's Triclinium [Fig.17] c.800, shows signs of some possible later sophisticated employment of the device, but is too small a sample to really judge with any certainty.

It is not necessary to stay in the realm of early mosaics and painting to look for examples where use of green as balance and contrast enhancement to the reds of flesh tones is *not* employed. Even if Eastern wall paintings followed the practice of painting flesh on a green modelled grounding the tradition of Byzantine icon painting required working, and still does, from a flesh coloured base both up to lighter tones and down to darker variants of the same colour.⁷⁴ The examples for such work would have readily been available on imported panels and such conventions were still guiding Venetian workers well into the Trecento. There, Paolo Veneziano besides providing items for Eastern patrons was also painting works for local use. The *Pala d'Oro* cover shows such dark complexioned results [Fig.18].

The impression given by Cennini is that green under-painting, in the 13th & 14th centuries was the preferred way of working for any respectable painters. But there are clear indications that, though it was a wide spread practice, many important artists did not use it.⁷⁵ In the middle of the Trecento, for example, there are frescoes by Puccio Capanna apparently carried out with little or no benefit of such preparatory colouring. This departure is particularly noticeable now, as it might have been in the mid-14th century, with the close proximity of examples of some of his c.1330s work, a *Lamentation*, *Flagellation*, and a *Crucifixion* [Fig.19 facing p.91], to one painted by Pace di Bartolo [Fig.20 facing p.91] perhaps only twenty years later. Both are currently in the Museo di S.Rufino, Assisi, and both came originally from the same location, the *Oratorio della Fraternità di S.Rufinuccio*.⁷⁶ The green underpainting in Pace's painting is very evident while the treatment of faces and flesh by Puccio shows no sign of it. The only isolated use of it by him gives a deliberate touch of pallor to the dead

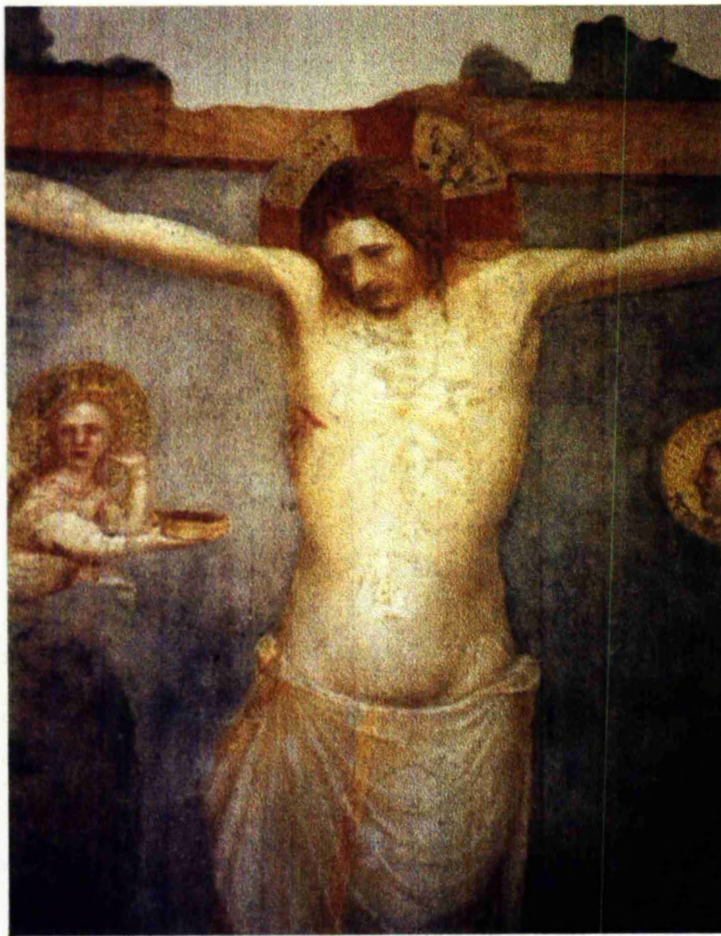


Fig. 19 : Puccio Capanna,
Crucifixion, detail,
fresco, c.1330s
Assisi, Museo di S.Rufino.



Fig. 20 : Pace di Bartolo,
Donor, detail of *Madonna
and Child with Two Angels
and Donor*.
fresco, c.1350,
Assisi, Museo di S.Rufino.

Christ in the adjacent *Lamentation* [Fig.21 facing p.92]. Elsewhere Puccio's shading on the skin ranges from pink down to brown and up to convincing white highlights. As another example, Tomaso da Modena, in the 1350's, was also painting with little sign of preparatory terre-verte, or of its use in his modelling. The technique of starting from light or mid toned flesh colour base and shading down from this, with darkened modifications of the same, or similar, colours is patently effective in his hands.⁷⁷ His glowing pink complexions, as in the Dominican "portraits" of the S.Nicolo, Treviso, Chapter-House [Pl.384] or the *St Ursula* frescoes, are radiantly unsullied by some of the unhappier and at times sickly aspects of green underpainting.

***Disegno* and Form**

"As has been said you begin with drawing (*disegno*)" Cennini.⁷⁸

While light and shade are included in Cennini's ideas of drawing it is clear from this and other passages in *Il Libro dell'Arte* that there is a continuing emphasis on line and the clear delineation of form. The importance placed on it is also borne out in the execution of pictures, for this long tradition of the acceptance of drawing as the prime aspect in picture making is maintained in Duecento and Trecento painting.

The traditional priority of drawing was of long standing. Pliny reported the development of painting as following from initial linear depiction with colour and shading being later innovations.⁷⁹ But then he, and other commentators, give some indications of the early antagonisms between champions of drawing and pure forms and those supporting the development of shading techniques;⁸⁰ yet an earlier manifestation of the *disegno-colore* dichotomy.

The later practical importance of *disegno* can be followed in technical texts, Cennini's *Il Libro dell'Arte*, or Theophilus' *De Diversis Artibus*. Besides starting



Fig. 21 : Puccio Capanna. *Lamentation*,
fresco, c.1330s, Assisi, Museo di S.Rufino.

with drawing Cennini was at pains to maintain the clarity of its definition of form in the final stages of work. The tempera painting procedure for faces, for instance, ends with the advice “...outline all the accents (*stremità*) of the nose, eyes, brows, the hair, hands, feet, and everything in general...”⁸¹ Similarly the outlines of features in fresco are finally emphasised by line.⁸² The earlier *De Diversis Artibus*, in its relatively short painting section concentrated, even more than Cennini, on materials, pigments and the mechanics of craft with little noted on matters of detailed execution. But it concludes the sequence on the painting of figures with advice similar to Cennini’s, reinforcing linear detail in faces and bodies, by finally suggesting “Make all the lines round the nude (parts of the) figure in burnt ochre . . .”⁸³ Otherwise it freely assumes that drawing is already complete, with colours merely “filling-in” the figures.⁸⁴

Cennini included shading in his instructions on drawing, but this is implied as *within* any forms to be drawn. This is also apparent in actual painting practice. The attention to such localised shading was initially contained within each element and the outline shapes or forms were preserved. For example, the face or robe of the same character would be treated separately. Apart from some isolated experiments, no interactive shading or shadowing happens between such autonomous units until the beginning of the Quattrocento with Masaccio and Gentile da Fabriano.

Disegno as a term takes on a deeper significance later, with other connotations, but is appropriate in discussing Duecento and Trecento works. Indeed, the later formal debate and the polarisation of *disegno* and *colore* is prefigured here in the tension between artists’ attempts at reporting the natural accidents of light and their more conservative following of form-centred traditions with a clinically linear approach. This tension is evident in tendencies to avoid any intrusion of shading or shadows into clean forms. Any ambiguous lines resulting from the edges of hard shadows are

avoided, as is any over emphatic shading which might compromise or obscure line and form. The fundamental thinking, underlying the nature of debate here, is the same as for the much later Poussiniste-Rubeniste arguments. The tensions, articulated in pictures, are between the depiction of the Platonic concept of ideal objects and the accidents of actual existence consistent with a nominalist point of view. The “true” form is prized and to be depicted with the artists looking for a sense of the ultimate truth rather than anything ephemeral. In this many anomalies observed in 13th and 14th century pictures might be explained away as areas of conflict between *disegno* and innovative shading exercises. They can readily be seen as accommodations, successful or not, which seek to avoid or defuse the tensions involved in retaining formal integrity while striving to present some credible pictorial correspondence with those natural light and shade phenomena of which some artists were clearly visually aware.

Chapter 1 Notes

- 1: M.H.Pirenne *Optics Painting & Photography*, Cambridge 1970, p.183. "... there is no reason to think that the main essential characteristics of human vision have changed in the course of history, or even prehistory." Gombrich, *op.cit.* (*Art and Illusion*), p.92, in discussing prehistoric art considers, "The best working hypothesis in such matters is the assumption that there was not much biological and psychological difference between our caveman ancestors and ourselves." and in relation to antique art, p.101., "... mankind can hardly have changed in the period which separates us from the archaic Greeks . . ."
- 2: Lindberg, *op.cit.* (*Theories of Vision*), pp.2-17.
- 3: Alberti (Grayson) *op. cit.*, pp.40-41. "Verum non mimima fuit apud priscos disceptatio a superficie an ab oculo ipsi radii erumpant. Quae disceptatio sane difficilis atque apud nos admodum inutilis pretereatur."
- 4: Significantly the Italian version *Della Pittura* of a year later, 1436, omits this note on intromission and extramission. See Alberti (Mallè), *op.cit.*, p.58.
- 5: Named after J.H. Lambert, 18th century physicist, mathematician, astronomer and philosopher who defined its properties.
- 6: Zeki, *op.cit.*, pp.227-255 covers colour vision.
- 7: Gage, *op.cit.*, p.192.
- 8: Zeki, *op.cit.*, p 227-239.
- 9: Hills, *op.cit.*, p.12.
- 10: *Ibid.*, p.12.
- 11: Cennini (Thompson), *op.cit.*, Ch. XXVIII p.15. The Italian reads "Attendi, che la più perfetta guida che possa avere e migliore timone, si e la trionfal porta del ritrarre di naturale". Cennini (Tempesti), *op.cit.*, p.44.
- 12: Crombie, *op.cit.*, p.128.
- 13: *Ibid.*, p.131.
- 14: Lindberg, *op.cit.* (*Theories of Vision*), covers the contributions of the various Arab scholars to the theories of vision and light. *Ibid.*, pp.18ff. Al-Kindi c.800-866 ; pp.43ff, Avicenna, 980-1037 ; pp.52ff, Averroës, 1126-1198 ; pp.60ff Alhazen, 965-1039. While *ibid.*, pp.209-213, provides a list of various relevant Arab and Greek texts concerning vision and light and an indication of how they became accessible in Latin during the 12th and 13th centuries.
- 15: *The Koran*, trans. N.J. Dawood, 4th edition, London, 1974, p.162, Ch.41: 53, "We will show them Our signs in all the regions of the earth and in their souls, until they clearly see that this is the truth." This is one of the texts which is interpreted as an invitation to seek out the physical nature of the earth. It justifies the Arab investigations of what is essentially Allah's good world, rather than the source of earthly evil or corruption, as characterised by the Christian Church with its concept of Original Sin.
- 16: Alhazen's *Optica* or *De aspectibus* was translated into Latin in the late 12th or more likely in the early 13th century, see Alhazen, *op.cit.*, Vol II, pp. lxxiii-iv. Its influence starts to become apparent around the mid Duecento. Grosseteste had knowledge of Al-Kindi's and Avicenna's works, but probably did not know Alhazen's, see Lindberg, *op.cit.* (*Theories of Vision*), p.94-95, whereas Albertus Magnus had some limited contact as illustrated in his later works, *ibid.*, p.105. Subsequently Bacon relied very much on Alhazen, see Lindberg, *op.cit.* (*Bacon Philosophy of Nature*), p.xxxiv, and Lindberg, *op.cit.* (*Theories of Vision*), pp.109-116. Then Pecham, Lindberg, *op.cit.*, (*Perspectiva Communis*), pp.131 & 173,

cites him directly as the “auctor” and indeed writes, pp. 130 -131, that he is following in the footsteps of the Author (Alhazen), “huius Auctoris . . . vestigia sequendo.” *Ibid.* pp.117-119, also reports that Witelo in his *Perspectiva*, written probably in early 1270’s about the same time as, or just before, Pecham’s *Perspectiva Communis*, followed Alhazen very closely, to the extent he could be later dubbed “Alhazen’s Ape”. At the same time, both Witelo and Pecham derived many aspects of their thinking, including interpretations of some of Alhazen’s writing, from Bacon, *ibid.*, p.117.

- 17: *Ibid.* p.29.
- 18: *Ibid.* Prop I.7, p. 73-75.
- 19: Hills, *op.cit.*, p.11.
- 20: Lindberg, *op.cit.* (*Bacon’s Philosophy of Nature*), p.4-5, “sed tamen usualiter accipimus lucem pro lumine et encontrario.” Nevertheless, we usually employ *lux* and *lumen* interchangeably.
- 21: *Ibid.*, pp.xxv-xxvi.
- 22: Alhazen, *op.cit.*, Vol.II, p.lxxvi. Notes that “The Latin translation in all extant manuscripts and in Risner’s edition lacks the first three chapters in Book I.” [The Risner, 1572, Basle, publication besides a translation of Alhazen’s *De aspectibus* also included Witelo’s *Perspectiva*, *ibid.*, p.lxxv].
- 23: *Ibid.*, Vol.I, Bk.1, Chapter 3 pp.13-20, establishes, in sections 1-21 the rectilinear propagation of light, initially for ‘primary lights’. *Ibid.*, p.20, section 21: “Let us call ‘primary lights’ those lights that radiate from self-luminous bodies.” He then continues, *ibid.*, p.20 ff., to investigate the phenomenon of indirect illumination. He finds this, a) in the re-radiation of sunlight from the atmosphere which provides that general illumination, which is separate from direct sunlight, filling out the sun’s cast shadows and is available during daytime from dawn to dusk, and b) in the re-radiation of light from illuminated objects, walls, foliage or fabrics etc. This indirect illumination he finds is also subject to rectilinear propagation. *Ibid.*, p.23 section 29, reads “This property, I mean the radiation of lights from accidental lights in straight lines, can be examined by an accurate experiment that leads to certainty.”
- 24: Lindberg, *op.cit.* (*Bacon’s Philosophy of Nature*), pp.102-103.
- 25: Lindberg, *op.cit.* (*Perspectiva Communis*), pp.102-103 Prop.I.25, secondary light “circumferencialiter se diffundit”.
- 26: *Ibid.*, pp.102-103 Prop.I.25, “. . . nullum penitus natura perspicui sit privatum et ad minus circumfulgentiam impedire non potest lucis secundarie.”
- 27: *Ibid.*, p.83-85, Prop.I.9.
- 28: *Ibid.*, pp.100-103, Prop. I.23, I.24 and I.25.
- 29: Alberti (Mallè) *op.cit.*, p.61 has the Italian “più fusca” which Spencer, in Alberti (Spencer) *op.cit.*, p.48, translates as “more hazy”, and though there is the notion of indistinctness in these terms the straightforward meaning is “darker” or “gloomier”. Grayson, in Alberti (Grayson) *op.cit.*, p.109 n.7, referring to the earlier Latin version and “fuscus” sees it as implying darkness. The Latin version has additionally “subobscuriorem”, *ibid.* p.42, to make a separate point of lack of clarity.
- 30: Lindberg, *op.cit.* (*Perspectiva Communis*), pp.94-95, Prop. I. 18 “In puncto propinquiori fortior est lux unius corporis quam in remotiori”. He also interestingly explains it in terms of rays spreading, “certum est quod linee a centro egredientes quanto magis a centro distant tanto magis invicem disgregantur.”

- 31: Pliny, *op.cit.*, Bk.XXXV.127, p.355, “Dein, cum omnes, quae volunt eminentia videri, candicant faciant colore, quae condunt, nigro,” Albert Lejeune, ed., *L’Optique de Claude Ptolémée*, Louvain, 1956, II. 127, p.76 “Et ideo pictor, com voluerit ostendere has duas figuras per colores, ponit colorem illius partis quam vult eminentem videri, lucidum; colorem vero illius quam vult concavum videri, magis latentem et obscuriorem.” Longinus, *On the Sublime*, Loeb Classical Library, London, 1995 pp. 232-233, “ἐπὶ γὰρ τοῦ αὐτοῦ κειμένων ἐπιπέδου παραλλήλων ἐν χρώμασι τῆς σκιάς τε καὶ τοῦ φωτός, ὅμως προὔπαντὰ τε τὸ φῶς ταῖς ὄψεσι καὶ οὐ μόνον ἔσοχον ἀλλὰ καὶ ἐγγυτέρω παρὰ πολὺ φαίνεται.” Philoponos (Johannes Grammaticus) in *Commentaria in Aristotelem Graeca*, Berlin 1900, XIV, i, p.73 (Aristotle p.342 b14), “καὶ γὰρ εἰ ἐν τῷ αὐτῷ ἐπιπεδῷ λευκὸν θείης καὶ μέλαν καὶ πόρρωθεν αὐτὰ θεωρήσειας, ἐγγύτερον εἶναι δόξει τὸ λευκόν, τὸ δὲ μέλαν πορρώτερον.”
- 32: Theophilus (Dodwell) *op.cit.*, Ch.16, p.15, “Hoc opere fiunt throni rotundi et quadranguli et tractus circa lumbos et arborum stipites cum ramis et columnae et turres rotundae et sedilia et quicquid rotundum apparere uelis. Fiunt etiam arcus super columnas in domibus eodem opere, sed uno color, ita ut interius album sit et exterius nigrum. Turres rotundae fiunt cum ogra, ita ut in medio sit albus tractus, et ex utraque parte procedat ogra omnino pallida et paulatim trahens croceum colorem usque antepenultimum tractum, cum quo misceatur modicum rubeum,”
- 33: Cennini (Thompson) *op.cit.*, Ch. LXXXV, pp.55-56, and elsewhere, recommends the practice, as in p.46 for faces, p.49 for drapery and p.55 for landscape.
- 34: P.Marshall, ‘Two scholastic discussions of the perception of depth by shading,’ *Journal of the Warburg and Courtauld Institutes*, Vol. 44 (1981) pp. 170-175.
- 35: *Ibid.*, p.171 “Et ideo in picturis propter intensionem et remissionem colorum aliquando iudicamus planum esse concavum, vel convexum et super eminens, quia sicut color est intensius in uno loco magis quam in alio.”
- 36: *Ibid.*, pp.171-172, “infero quod possibile est aliquam rem que in veritate est plana iudicare quod sit concava, nam sit aliqua superficies plana que versus partes circumferentiales sit colorata colore albo et versus medium sit colorata colore nigro -- et secundum quod ille patres magis sunt propinque circumferentie tanto sint albiore, et secundum quod sunt propinquiore medio tanto sint nigriore. . . . Et ergo quando pictores in aliqua superficie plana volunt facere quod aliqua pars illius superficiei appareat supereminens, illam colorent colore qui multum habet de luce sicut colore albo; partem autem quam volunt apparere esse depressam colorant colore qui modicum habet de luce et colore obscuro sicut est nigri.”
- 37: E. Lunghi, *The Basilica of St Francis in Assisi*, Florence, 1996, p.20, dates the St Francis Master’s Lower Church frescoes between 1255 & 1265, probably during papacy of Alexander IV and before 1265 when St Bonaventura’s *Legenda Maior* determined a change in the iconography of St.Francis’ vision, requiring a crucified Christ rather than a seraph in this.
- 38: The dates of Cimabue’s activity in S.Francesco Upper Church, including the painting of the transepts, are much debated with no final consensus reached. These will be discussed later in Chapter 3 pp 8-14. The date offered here follows Bellosi, *Cimabue*, New York, 1998, p.165, proposing that “Cimabue was active in Assisi between roughly 1288 and 1290 ; that is . . . during the first years of the papacy of Nicholas IV, the first Franciscan pope, the pope who, we have seen

- now, was the most likely papal director of the fresco decoration in the Upper Basilica of Assisi.”
- 39: Alberti (Spencer), *op.cit.*, p. 83.
- 40: The sun as a light source is so far away that, though the inverse square law still applies, the difference between the square of 10^n miles and the square of $[10^n + 1]$ miles is not worth bothering about.
- 41: V.J.Bruno, *Form and Colour in Greek Painting*, London, 1977, p. 43, “The illusion of form depends upon a double law of three-dimensional representation in painting which all artists learn in school: brightness and opaqueness advance; dullness and transparency recede.”
- 42: Leonardo (McMahon) *op.cit.*, Vol. I pp. 101-102, and Vol II 78 r, “E’ci un’ altra Prospettiva la quale chiamo aerea, impero’ che per la varietà dell’aria. Si puo cognoscere le diverse distantie di vari edifici terminati ne loro nascimenti, da una sola linea come sarebbe il vedere molti edifici di là da’ un muro che tutti apariscono sopra alla stremità di detto muro d’una medesima grandezza. Et che tu volessi impittura fare parere piu lontano l’uno che l’altro, c’da figurare un’aria un poco grossa tu sai che in simile aria l’ultime cose viste in quella come sono le montagne per gran quantita dell’aria che si trova infra l’occhio tuo et la montagna quella pare azura quasi del colore dell’aria quando il sole e’ per levante . . .”
- 43: See note 40 above.
- 44: Dante, *op.cit.*, Paradiso, pp. 34-37, Canto II, line 49 ff.
- 45: *Ibid.*, p. 36, Canto II, lines 91-93, “Or dirai tu ch’el si dimostra tetro / ivi lo raggio più che in altri parti, / per esser li refratto più a retro”
- 46: *Ibid.*, p. 36-37, Canto II, lines 97-102, “Tre specchi prenderai; e i due rimovi / da te d’un modo, e l’altro, più remosso, / tra’ ambio li primi li occhi tuoi ritrovi. / Rivoltio ad essi, fa che dopo il dosso / ti stea un lume che i tre specchi accenda/ e torni a te da tutti ripercosso.”
- 47: *Ibid.*, p. 36-37, Canto II, lines 103-105, “Ben che nel quanto tanto non si stenda / la vista più lontana, li vedrai / come convien ch’igualmente risplenda.”
- 48: Lindberg, *op.cit.* (*Perspectiva Communis*), p. 13, notes an early citation by Duns Scotus (d. 1308).
- 49: V.S. Ramachandran, “Perception of Depth from Shading,” *Scientific American*, 269, (1988), pp. 58-65, and in Gregory, *The Artful Eye*, *op.cit.*, pp. 250-251.
- 50: Bruce & Green, *op.cit.* p. 9.
- 51: Cennini (Thompson) *op.cit.*, Ch. CL, p. 95.
- 52: *Ibid.*, Ch. LXVII, p. 45.
- 53: Both Theophilus and Cennini advise on colour mixtures. For example Theophilus (Dodwell) *op.cit.*, Ch. XIV, p. 10-13, covers a variety of mixtures for the colouring of garments, as does Cennini (Thompson) *op.cit.*, Ch. LIII- LV, pp. 32-33 or Ch. LXXII and LXXIII p. 52.
- 54: Origo, *op.cit.*, pp. 234-237. The cost of materials, gold and expensive ultramarine for example, was prominent in discussions of quality, and notes, p. 236, that there was a noticeable “contrast between the small amount paid for an artist’s or craftsman’s skill, and the high cost of his materials.”
- 55: Hall, *op.cit.*, p. 16.
- 56: Alberti (Spencer), *op.cit.*, p. 85.
- 57: Shearman, *op.cit.*, p. 2.
- 58: Cennini, *op.cit.* Ch. LXXI pp. 49-50,.
- 59: Hall, *op.cit.*, p. 47.

- 60: Alberti (Grayson), *op.cit.*, p.89, in translating the Latin of *De Pictura* has "... you may change the colour with a little white applied as sparingly as possible in the appropriate place within the outlines of the surface, and likewise add some black in the place opposite it. With such balancing, as one might say, of the black and white a surface rising in relief becomes still more evident. Go on making similar sparing additions until you feel you have arrived at what is required." The Italian version, Alberti (Mallè) *op.cit.*, p.100, and Spencer's translation, Alberti (Spencer), *op.cit.*, p.83, are rather more abbreviated, omitting the initial note of colour.
- 61: D.Bomford, J.Dunkerton, D.Gordon, A.Roy, with contributions from J.Kirby, *Art in the Making: Italian Art Before 1400*, London, 1989, p.94.
- 62: *Ibid.*, p.123, shows various pigment mixes in selections of microscopic samples.
- 63: Shearman, *op.cit.*, p.4.
- 64: Cennini (Thompson) *op.cit.*, Ch.LIII-Ch.LVI, pp.32-33.
- 65: *Ibid.*, Ch.LXXVII-Ch.LXXX, pp.53-54.
- 66: *Ibid.*, Ch.LXVII, pp.45-47, for fresco and Ch.CXLVII, pp. 93-94, for tempera.
- 67: *Ibid.*, Ch.LXVII, pp.46-47 and CXLVII, p.94.
- 68: *Ibid.*, Ch.LXVII, p.46.
- 69: Gage, *op.cit.*, p.43.
- 70: Personal visit September 1997.
- 71: W.Oakeshott, *The Mosaics of Rome: From the Third to the Fourteenth Centuries*, London, 1967, pp. 207-208 and 376 discusses probable dating, with 11th century being the most likely.
- 72: *Ibid.*, p.156, notes "a thin line of silver-green".
- 73: L'Orange & Nordhagen, *op.cit.*, p.10.
- 74: L. Ouspensky & V. Lossky, *The Meaning of Icons*, trans. G.E.H.Palmer and E. Kadloubovsky, New York, 1989, p.54.
- 75: Cennini (Thompson) *op.cit.*, Ch.LXVII p. 46. "some begin by laying in the face with flesh colour; then they shape up with a little verdaccio and flesh colour, touching it in with some high lights: and it is finished. This is a method of those who know little about the profession."
- 76: Information from S.Rufino Museum.
- 77: R.Gibbs, *Tomaso da Modena, Painting in Emilia and the March of Treviso, 1340-80*, Cambridge, 1989, p.4. L.Coletti, *Tomaso da Modena*, Venice, 1963, pp.35-38.
- 78: Cennini (Thompson) *op.cit.*, p.4.
- 79: Pliny, *op.cit.*, Book XXXV, 15-16, pp.271-273, tells of myths of early line drawing before flat colour "monochrome" was added, and, in XXXV, 29, pp.281-283, of the subsequent developments of colour, light and shade, and shine.
- 80: Pollitt, *op.cit.*, pp.251-252, discusses complimentary references to Parrhasius in Pliny, *op.cit.* XXXV, 67-68, p.311, and points to indications in these passages by Pliny, and also to Quintilian's comments (*Inst.* 12.10.4) of "an ancient controversy between the relative merits of painting and drawing."
- 81: As translated in Cennini (Thompson) *op.cit.*, Ch.CXLVIII p.94, the Italian *stremità* becomes "accent", but the sense is clearly more about outlines.
- 82: Cennini (Thompson) *op.cit.*, Ch.LXVII p.47.
- 83: Theophilus (Dodwell) *op.cit.*, Ch.XIII p.9, "Omnes vero tractus circa nuda corpora fac cum rubeo..."
- 84: *Ibid.*, Ch. III p.5, has, for example, "... nuda corpora implueris."

CHAPTER 2

HISTORIC TRADITION OF LIGHT AND SHADE

The simulation of space and volume in painting and the contribution of light and shade to this has a long history reaching back through antiquity. The painters of ancient Greece were the first who “seriously challenged the absolute dominion of the flat pictorial surface”¹ They did so not just in terms of geometry but also in terms of their approach to light and its effects.

The tradition of Greek, Hellenistic and then Graeco-Roman painting is worth studying not just as the heritage on which Duecento and Trecento art is built, but also as an instructive parallel of later developments providing an appreciation of the common thought processes linking artists through the centuries. The continuity of this tradition runs, hesitantly at times but is never completely broken, from sixth century B.C. Greece through to the 13th and 14th centuries in Italy. Little survives of early mural or panel painting to give direct evidence of the procedures involved. A few 5th century B.C. tomb paintings have come to light in Italy while some more recent finds at Vergina and Pella have given us a tantalising glimpse of Greek late 4th century B.C. painting and early mosaics.² However, it is only from the first centuries B.C and A.D. that some happy survivals, particularly those preserved at Pompeii and Herculaneum, provide a reasonable body of works, both original and copies, for assessment. This corpus is still very limited and, being mainly mural work or mosaics, leaves the field of panel painting largely unrepresented. But a general appreciation of the technical standards of the late Republican and early Imperial periods can be obtained from these. As for indications of work on the earliest periods, at the dawn of picture space, we must rely, firstly, on the parallel efforts of vase painters whose more durable products survived where monumental paintings perished, then on later copies, and thirdly on the

writings of later Greek and Roman commentators. A few antique writers, Pliny, Plato, Aristotle, Vitruvius, for example, can help. However they do so only through indirect references in writing on subjects other than painting. We find a miscellany of information, for example, on sources of pigments and other materials, or generalised comments on style or some personal preferences for particular vogues. Nonetheless, their writings can be helpful in conjunction with what pictures we have. In particular they help greatly when read along with the best early contemporary evidence, vase painting. It is, though, worth noting here that vase painting was essentially a decorative art, and also that any serious attempt to offer a model of realistic space would be thwarted by working on pottery's curved surfaces.

Even before the advent of monumental painting there are signs of an intuitive feeling for depth in early vase painting. Within the silhouette bodies of Black Figure work the forms of muscles and tendons were shown as contour lines telling of protrusions or depressions. So painters like Nearchos, c. 560 B.C. [Pl.1] show variations in depth as well as the outline of form. Additionally they employed flat variations of tone with added white and mid tones. These were used rather diagrammatically for pattern or for separating overlapping forms, but this separation readily implied variable depth of the planes involved. The linear effects continued on into the more flexible Red Figure painting, where to give a more subtle impression of the detailed rise and fall of a body's shape, the variation of line strength, suggesting heavier or lighter shadows, was consciously employed by painters like Euphronios and Euthymides [Pl.2] in the late 6th century B.C. Translucent glazes implying more subtle tones and shading then appeared, as did lightly hatched shading [Pl.3]. Subsequently, the combinations of these ploys came together in white ground working, as in the Pistoxenos painter's *Aphrodite on a Goose*, c. 470 B.C. [Pl.4], where variations in line

strength shape the goose's wings and round off Aphrodite's cloak. Meanwhile, graded glazes subtly add to the effect and, in this example, give solidity to the leading edge of the bird's wing which tapers out to the thinner trailing feathers.

We can look for hints or isolated signs which might suggest some shading appearing in vase painting, but the indications from literary works are that early monumental painting was essentially a linear discipline interested mainly in form. Any suggestion of depth was implied by forms of geometric foreshortening. The advent of this is recorded by Pliny in writing of Kimon of Kleonai. He it was "who first invented 'catagrapha', that is, images in 'three-quarter', and who varied the aspect of the features, representing them as looking backward or upward or downward."³ Whether or not Kimon was actually responsible for any such invention, or just traditionally given credit for it, he worked in the closing decades of the 6th century. These innovations, which Pliny ascribes to him, might be seen to be illustrated in contemporary early Red Figure vase work.⁴ Thereafter early technical development through the 5th century seemed to have moved with artists, like Polygnotus, towards more precise, sophisticated drawing and to variations in ground line suggesting space. The *Niobid Vase*, c.460, [Pl.5] is considered to reflect now lost wall paintings executed by Polygnotus at Delphi and Athens in the mid 5th century B.C.⁵

No mention is made in ancient texts of shading or shadowing occurring before the end of the 5th century. The first painter to be given credit for offering pictorial light and shade was Apollodorus, an Athenian working c.408 B.C. He was subsequently dubbed *skiagraphos* by later commentators, though Pliny does no more than comment that he was the "first artist to give realistic presentation of objects."⁶ But, if Pliny did not register the nature of Apollodorus' invention Plutarch offered some more specific information, writing that he did so by means of a "fading out" or graduation of shades

and a “laying on” or “building up “ of these to give the effect of shadow.⁷ Pliny goes on to tell how Zeuxis then appears to have carried development of these techniques still further and became an expert practitioner of them.⁸ The advent of these innovations of the late fifth or early fourth century can be accepted with some confidence, for, as with all new steps, it had its share of criticism. Plato, for one, condemned the “deception” involved.⁹ There are, too, suggestions of a controversy between the relative merits of painting and drawing with the more traditional skills of an artist like Parrhasius being praised at the expense of Zeuxis.¹⁰

The skills that Apollodorus and Zeuxis brought to painting seem likely to have been restricted to local shading, kept discretely within each figure, for there is no real indication or record of background treatment until Pliny reports that Nikias, c.350-310 B.C. “paid close attention to light and shade and took great care to see that his paintings stood out from the panels.”¹¹ Then Quintilian used a term *circumlitio*, along with a phrase similar to that of Pliny, to indicate the technique of painting *around* figures to make them stand out.¹²

Subsequently, Pliny reports that with Apelles, Alexander’s renowned court painter, and his contemporaries, it was considered that the various skills had been perfected.¹³ So it is likely that the critical elements of shading techniques did come together at the end of the 4th century B.C. There was a consensus among antique commentators that the end of the 4th century saw the golden age of Hellenistic painting. Vergina’s few surviving wall paintings gives a glimpse of this late 4th century painting.¹⁴

We can infer from Plato’s condemnation of it that *skiagraphia*, as some sort of illusionistic technique, was well established and that graduations of tone were an intrinsic part of it, but we still don’t have a precise description of what constituted

ideas of light and shade in early 4th century B.C. painting. Pliny offers the earliest help with some broad information concerning the evolution of techniques. He relates that, following drawing and line, painters made use of flat areas of colour (*monochromata*) then later developed contrasts and variations in colour (*tonos*, and *harmoge*) to get light and shade (*lumen atque umbras*).¹⁵ Subsequently a final element *splendor* was then added to complete the range of techniques and this, he was at pains to point out, was quite distinct from general light tones (*alius hic quam lumen*) in basic light and shade variations.¹⁶ The term today would be *specular* reflection or more commonly highlight (see Chapter 1, p.54), though the latter does later get confused with the lighter parts of general modelling. The actual detailed nature of how the colour variations, contrasts and highlights were arranged is omitted here. But elsewhere, in writing of Pausias, a contemporary of Apelles towards the end of the 4th century, there is a suggestion that might indicate a first recorded use of reflected highlights, though the term *splendor* is not used here. In the process Pliny gives some hint of painters' light and shade practice.¹⁷ The anecdote tells of the depiction of a black ox seen straight on, not in characteristic profile. The implications are that with the black offering little chance of shading the contours of the animal could only be brought out by the shine reflected from different parts and planes of its coat. This new process he differentiated from painters' normal practice for light and shade modelling, noting: "Whereas all [painters] usually make what they wish to appear prominent in a light colour and in a dark one what they wish to withdraw"¹⁸ This repetition of the recipe, that light tones signify prominence and dark ones recession, which appears here as a commonplace, will recur over and over again. Subsequently, in a simplistic interpretation, it becomes an enduring "rule of thumb" in painting procedures which is followed faithfully in late antiquity and continues on into the 14th and 15th centuries to

inhibit some aspects of painters work. Clearly accepted, not questioned, it was evidently already part of a common understanding of the properties of light.

Before looking for further evidence in surviving pictures it might be useful to summarise these hypothetical developments in a rough and tentative timetable covering the reported initial development of light and shade in painting. It is based on inferences from the scant information from the available, but limited and later, literary sources, combined with some vase painting examples of generally agreed dates, accepting dates from Richter (1987) Boardman (1985& 1957) & Robertson (1953).

| | | |
|----------------------|----------------|--|
| Kimón | 520-500 B.C. | <i>catagrapha</i> , foreshortening. |
| Euthymides | 510-500 B.C. | Red figure Vase, foreshortening |
| Pistoxenos Ptr. | 500 450 B.C. | White ground Vase Isolated attempts at shading. |
| Polygnotus | 475-450 B.C. | Monumental Ptg. Ground line variation. |
| Niobid Ptr. | 460-450 B.C. | Red Figure Vase, Ground line variation. |
| Apollodorus | c.408 B.C. | <i>Skiagraphia</i> . Shading to provide local sense of volume. |
| Zeuxis | c.400 B.C. | Developed Shading to provide local sense of volume. |
| Parrhasius | c.400 B.C. | Continued linear tradition. |
| Nikias | c.350-310 B.C. | Indications of background shading. |
| Pausias | c.330 B.C. | Use of specular highlights |
| Apelles <i>et al</i> | c.325-300 B.C. | Fully developed techniques. |

The vase paintings seem to fit in with the innovations thought to be attributed to the monumental painters, as mentioned already, but there are almost no early

surviving Greek paintings, panel or mural, to offer illustrations of these. There are, though, some examples of frescoes, unfortunately quite isolated, from early periods in Italy. Wall paintings, c.550-500 B.C., in Etruscan tombs, with clear Greek influences, show stylised profile figures in outline with flat colour in-fill [Pl. 6]. The plain un-modulated planes would confirm their status as *monochromata* consistent with Pliny's report. Then there are some tomb paintings from the Greek colonies in Magna Graecia. The *Tomb of the Diver* at Paestum has some frescoes painted between 480 and 470 B.C. [Pl. 7]. These are essentially linear drawings exhibiting some sophisticated graphic skill but still with flat planes of solid colour added within the outlines. There is no sign of any attempt at modelling via shading. Any sense of three dimensions is provided linearly by some foreshortening of the torsos of characters reclining in a symposium scene. The heads of these are strictly in profile and the furniture is simply and frontally portrayed. The background is left untreated as a light coloured field. But then the painting has every indication of being done hurriedly immediately before the burial. There are signs of soft pigment and plaster being indented by installation ropes.¹⁹ It is possible that speed of execution could have restricted the work and prevented the embellishment of any background so that such expedited tomb works might not be representative of painting in general.

Later frescoes from the same location, but during the time of Lucanian control of Paestum, c.400 B.C., hint at some changes with indications of local shading. A tomb fresco of this period [Pl.8] has a *Nike in a Chariot* drawn by lightly but distinctly modelled horses while Nike herself has suggestions of shadows under her outstretched arms. Once again the background is left as light plaster. Elsewhere similar rudimentary shading is apparent on the darker male flesh colouring of a warrior from a 4th century tomb at Nola in Campania [Pl.9].

Further north there is a 4th century painted alabaster sarcophagus showing an *Amazonomachy* [Pls.10 & 11]. This, in the Florence Archaeological Museum, is categorised as Etruscan work but clearly has Greek influences. It offers light and shade modelling in a more developed form, both for horses and humans. In this case the backgrounds are painted, but as flat planes. The mid to light pink or mauve tones used for this are darker than the Amazons and the white horses and, though the Greek warriors have darker skins, their lighter clothing and some items of armour can help to indicate, in the spirit of lighter tones being more prominent, that they are forward of the background planes.

Relatively recent discoveries at Vergina, from 1977 onwards,²⁰ have provided, in a first glimpse of Greek painting proper, some indications of late 4th century B.C. work. The tombs at Vergina, c.340 B.C., have some surviving remnants of mural painting. The c.336 B.C., tomb of Philip II, has two main areas, cleaned but not restored, now available for assessment : a *Lion Hunt* frieze on the exterior facade of the tomb [Pl.12], and wall paintings inside the tomb [Pl.13]. Both have suffered considerable damage and deterioration, but fortunately their patches of survival still clearly retain indications of the expertise involved in each. The execution appears painterly on both facade and interior with little evidence of outline drawing, though delineation and detailing of the figures in the tomb painting is carried out with economic use of fluid linear brush strokes. Certainly there are inscribed lines on the plaster of *The Rape of Persephone* [Pl.14], but these appear to have been rough sketches testing the general layout, since the finished painting departs from these quite widely. Despite losses and deterioration there is still evidence of a range of colours in both areas.²¹ There is, though, a noticeable limitation to muted yellows and reds, with neutral modification, in the *Rape* figures. More saturated reds and yellows, together

with a striking violet, are reserved as foils for these in the chariot and garments, while strong blue is employed outside the painting for a decorative border. The *Lion Hunt* makes use of a more extensive palette with greens and blues in play. Both the facade and tomb show a conscious control of light and shade, but realised in different ways. Hatching is noticeably employed on the figures in *The Rape of Persephone* [Pl.15] inside the tomb, and subtly graded tonal and colour modelling can still be discerned as effective on faces on the facade [Pl.16]. In both the facade and interior paintings the distribution of the tones and hatched shading is not organised in any symmetrical way to suggest projection straight out from the picture plane towards the viewer but follows a definite directional sense mimicking the orientation of incident light. A factor in painting which was not mentioned in early texts, but which appears here is the cast shadow. Positive signs of a number of these still show in the *Lion Frieze* [Pl.17] on the ground around the figures, horses and the dogs. These again consistently follow a common lighting direction with light from the left. The background is left untreated and light in tone in the tomb and that of the facade is left as a white ground. Yet another tomb in the vicinity, discovered in 1982, and perhaps dating from the opening years of the 3rd century B.C.,²² has a facade with a well-preserved painting of a soldier showing a full range of colours and impressive general modelling [Pl.18]. Here there are, in addition to the general flesh modelling, signs of separate specular highlights on the arms, legs and face. Such use of sharper highlights, recording an early instance of Pliny's *splendor*, (see p.103 above) is *not* to be seen in the Royal tomb interior. Also the poor state of the facade *Lion Hunt* makes it difficult to determine whether it featured there or not. There is, though, a just perceptible trace of an eye highlight standing proud as a minor piece of *impasto* on the lion's eye; a special case of reflective highlight — available illustrations cannot show this. This leaves the

possibility that other sharp highlights could have been employed as final surface detail and that these have been lost. These survivals are limited samples, but even at that there are signs of distinct variety of working styles, all sophisticatedly painterly in execution. As far as the fluid execution of the interior is concerned, Andronikos makes a plausible case for its painter being Nicomachus.²³

From around the same period, c.300 B.C., several pebble mosaics, in Pella, show other signs of sophisticated interest in tonal modelling [Pl.19].²⁴ Additionally, while the tomb paintings had plain, unpainted and so light toned backgrounds, the mosaics are all given black backgrounds. This may just follow from the nature of the two procedures. The untreated backgrounds would readily arise by default in painting, whereas in mosaics, since positive action is needed to fill any background area, some choice could be exercised. Nonetheless, while such variations might just mark a difference between some conventions for wall painting and those for pavement decoration, there is here perhaps an early sign of light toned figures being pictured in front of dark backgrounds. The point of light tones offering advance with dark tones suggesting depth is perhaps being made in this instance. But then, if this is the case, the effect is reserved strictly for the separation of foreground figures from the background. Again just like their contemporary paintings these figures are not modelled to give local symmetrical recession of arms, legs or heads, which would provide for projection straight out of the picture towards the viewer. In fact the shading, somewhat abrupt with the limited subtlety of transition in mosaic, draws even more attention to the divide between light and shade, and follows a distinct sense of lighting direction. In the *Deer Hunt* [Pl.19] the shading of the deer and the two hunters are all modelled as lit from the left and, just like the figures in the tomb paintings, were modelled to conform to a common lighting orientation.

These are hardly substantial pieces of evidence, particularly the early Magna Graecia items, but in the absence of any others it is perhaps significant that these, essentially provincial versions, do seem to follow, albeit inexpertly, the 5th and 4th century timing for development of techniques which were implied by the antique commentators. They do fit broadly with what we might glean from Pliny and others to take us from Kimon, through Apollodorus and Zeuxis, to the sophistication of the period of Nikias and Apelles.

Further evolution and variations in painting practice clearly continued over the next 3 centuries and, from indications in the various texts, passed through different fashions and styles of working. There are some survivals of Hellenistic and Graeco-Roman sculpture, but painting has not been so lucky. Apart from the few precious remnants of late 4th century B.C. works in the Vergina tombs, already noted, no painted works survive to tell of the progress of graphic techniques. The only assessment we might make of the developing works of this early period has to be second hand via copies of now lost works and from influence on later painting developments in Rome and Italy. Certainly the pictures which survive from the first century B.C. and A.D., show that many aspects of painting had developed. There is evidence of a wide range of interests in different genres, with every indication of established techniques in landscape, still life, genre and *trompe l'oeil*: areas which were not reported or available in survivals from earlier times. The skills and approaches seen fleetingly in Vergina appear fully developed across a whole range of works. Tonal modelling, together with the use of specular highlights, has now been fully explored and both are employed accurately and confidently as obvious mimics of natural phenomena. Cast shadows, too, are fully reported. Suitable examples are *Perseus and Andromeda* [Pl.20] or *Hercules and Telephus* [Pl.21]. In these as others

directional light is reported. There is little sign of any automatic adherence to a “light advances dark retreats” recipe which worked locally in simple indication of projection and recession from the picture plane. Such approaches are also illustrated in mosaic works of the period, some of which, as reputed copies of earlier works, might offer some sense of a consistency of approach to recording lighting effects between the 4th century B.C. and the 1st century A.D. Of these one of the most notable examples is the *Alexander Mosaic* [Pls.22 & 23], a late 2nd century, or early 1st century B.C. copy of a 4th century B.C. work.²⁵ This again illustrates the early use of general modelling with light and shade and the effective, but quite separate use of specular high lights. Here, within a restricted palette reportedly used by some artists in the 4th century,²⁶ there is a clear interest in light and shade effects. The modelling of form, faces, bodies and other features is carried out following a sense of illumination from the left. The local white notes, however, are *not* indications of whole planes of projection or elevation within this tonal scheme. These elements serve to indicate precisely the points where a mimic of the reflection of incident light, from the left in this particular case, suggests local surface angle and the sheen or shine of varied textures [Pl. 23]. If the *Alexander Mosaic* is an accurate copy of a celebrated earlier Hellenistic work such observant subtlety is to be seen as part of the trade skills of Greek painters in the last decades of the 4th century B.C.²⁷ In this it is consistent with the Pella and Vergina working practices, but in another style and medium. Alternatively, if a precise correspondence of copy and original modelling is too problematic, it would tend to show that by around 100 B.C. artists were closely observing nature rather than merely mechanically following any standard procedure.

It is worth noting that, while earlier the pictures and quotations from Pliny were some centuries apart, now the main body of pictures, which we have as evidence,

survive precisely from Pliny's time, created in the first century A.D. or preserved as valued works from the early centuries B.C. He died in 79 A.D., succumbing at Stabiae to the volcanic fumes associated with the eruption of Vesuvius which, in encapsulating Pompeii, Herculaneum, their environs and the wall paintings contained in their buildings, preserved these pictures for us.²⁸

Pliny's statement on projection being depicted in light tones and recession in dark ones has proved on inspection to be a not very accurate account of most early painting practice, at least in detailed modelling. Beside this, another major aspect of painting, where 1st century B.C. and A.D. painting practice was obviously at variance with this rule, was the depiction of daylight exteriors. There are many paintings from Roman Imperial times which suggest the softer contrast of atmospheric distance rather than offer a darkening background. Even in the *Alexander Mosaic* [Pl.22] the background was given a light tone of indeterminate distance, and, while for painting, as in *The Rape of Persephone* this could be provided by default, with the background being left as un-painted light toned plaster, for mosaic the use of light coloured tesserae in the background is a positive action. The frescoes in *The Room of the Masks*, in the Palatine House of Augustus [Pl.24] show imaginary exteriors of reduced contrast beyond a foreground which displays a full modulation of tones. Then from a villa on the Esquiline we have some 1st century B.C. landscapes illustrating Odysseus' adventures [Pls.25 & 26]. The aerial perspective within these is quite at variance with any concept of distant pictorial darkness. They have atmospheric softening of contrast, but in effective and consistently modelled scenes. The painter was manifestly perceiving, and registering, exterior scenes without any theory of advancing lighter tones, or rules arising from it, controlling his work. Moreover, to add further emphasis to the softened realistic depth of the narrative scenes, the framing fictive

pillars and lintels exhibit a quite pronounced contrast. These register as a positively chosen foreground tonal datum for the “exterior” scenes. Noticeably the directional consistency of the “exterior” scenes is left to right while that of the “interior” pillars is the reverse. The interior domain of the viewer and that of the legend is distinctly separated giving every sign that a sophisticated appreciation of the varied nature of light’s local and distant effects was consciously employed. The understanding that in daylight the expression of distance can come from light tones and limited contrast, not darkness, is obvious.

There is in all of this something of a puzzle, for, despite the obvious evidence of wide departures from it in practice, there is an established written tradition that painters relied on lighter tones to offer projection and darker ones to tell of recession in painting. Seemingly, since Pliny used it as a commonplace (see pp.103-4 above), this concept predated the first centuries B.C. and A.D. It also continues thereafter to become an enduring rule. It is found in writings through the centuries from Ptolemy, c.90-168A.D., Longinus, c.213-273 A.D., Philoponos, 6th century A.D., and was seriously discussed in mid-14th century papers at Paris University (see Chapter 1, pp.68-70 above). But, if early evidence from antique painting could suggest that it was merely a literary *topos*, since it was more often ignored than observed, in later technical writings it is aimed specifically at artists. Theophilus’s, 12th century *De Diversis Artibus* and Cennini’s c.1400 *Il Libro dell’Arte* both offer advice observing its usage, while Alberti in *Della Pittura*, in 1436, repeats this idea that with light weakening with distance distant objects must become darker (see Chapter 1, p.67 above). Moreover, in step with this technical literature, it had clearly become a noticeable element in painting practice in the 13th and 14th centuries. This is particularly apparent in the treatment of daylight exteriors where there is every sign

that the later artists, unlike their antique colleagues, tended to follow the “rule of thumb” that darker tones were needed for distance.

Rather than merely noting differences and anomalies, some justification of this rule’s axiomatic acceptance for picture making, continued currency in antiquity, and its perpetuation into the late medieval period, ought to be sought. As noted earlier (pp.71-72) there is a reasonable case to be made for recession resulting in darker appearances in interiors, or in artificially lit circumstances, where distance from the spectator also means distance from the light. That applies in broad terms for a figure against a more distant background. But to see the rule working for facial and figure detail is more of a problem. Small increments of distance give indiscernible differences on the various planes of features. How could the rule be seen to apply here or rather how might it seem to be applying ?

The phenomena of observed highlights, both specular and diffuse, can correspond approximately to local convexities of a face or body. The surfaces of such a rounded feature as a nose, a finger or an arm, lie at varying angles. One angle allows for direct bright reflection of incident light towards the viewer’s eye. Unless the illumination is from exactly the same direction as the spectator’s point of view the position of any apparent highlight will be observed, not on the point of the surface nearest that viewer, but on that side of the prominence which slopes off towards the light. If the illumination arrives at an angle which is not too oblique the resulting bright spot is found only slightly to one side. Any difference between the point nearest the viewer and that which optimally reflects the light is minimal. Though the perceptive artist, with some delicate care and accuracy based on observation, could put the lighter tones and, more particularly, the sharp bright reflections in positions corresponding to natural effects, such subtle location could be lost on those with less

direct visual involvement. As a result the generalised statements of commentators, as repeated by Pliny *et al*, could be seen by them to be broadly true. In addition for a face the height of brow or nose is still reported above the notional basic level of the face, but in fact relative to the incident angle of light, not above any picture plane datum as judged from the viewer's position. The features protrude into the light but not necessarily towards the spectator — the two only coincide where the pose is straight frontal and the lighting is also frontal. In this, projection does have some general correspondence with light tones and reflections, even if the axis of that projection is not straight out of the picture. So, even in looking at local effects the accurately painted and theoretical statements might be seen to happily coexist, with the latter an acceptable approximation to the former as far as the less visually discerning writers noticed. They clearly accepted this rule as a *topos* in general literature and it was used readily as illustration. Through time it became entrenched in thought. Subsequently it received some rational justification in 13th century treatises, as in Pecham's *Perspectiva Communis*, and was given serious consideration in discussions on perception (see Chapter 1, pp.69-70 above).

While the broad rule could have been perpetuated in this way any embarrassing anomalies presented in naturalistic depiction of daylight exteriors gradually disappeared with the progressive decline of illusionistic art during the early centuries of the Christian Church. The Christian Church was first given freedom from persecution, in common with other religions, in the so called Edict of Milan of 313 A.D.²⁹ Subsequently Christianity became the official state religion and this is reflected in the changes in art as this evolved over several centuries. The loss of the majority of pagan works when these were replaced, as Christianity became the main source and subject of art, left us with an essentially religious art. Then, following the Neo-Platonic

teachings of Plotinus in the late 3rd century A.D. which had significant influence on the ideas of the early Church from the 4th century onwards, there was a progressive move towards a spiritual and transcendental art rather than one of realistic illusion.³⁰

With less need for any direct reference to this world there was a commensurate lack of a requirement for realistic backgrounds. The real point of any pious church decoration was centred on the revered figures of biblical teaching. Even where some narrative content was required the important elements were the faces and figures themselves. Any secondary context was eventually displayed in a token manner and, while individual figures and faces had some local attention paid to naturalistic effects, their associated backgrounds simply became succinctly coded indications, merely minimal ciphers to carry the basics of necessary narrative. Coincidental with this, but perfectly in keeping with the transcendental ethos, was the employment of gold tesserae. This offered an intrinsic sense of sumptuous value, presumably part votive in underlying intent. Importantly this also brought attention to the rich nature of the surface of the works, confirming the nature of these images as symbols on a plane rather than as illusionistic representations. The largely plain gold, or earlier blue, backgrounds were symbolic. Occasionally the blue might represent the sky with some stylised clouds but otherwise these backgrounds made no claims to be treated as illusionistic [Pls.67 & 68]. The backgrounds appearing as film colour (see Chapter 1 p.58 above) would have no surface meaning, just undefined depth. The anomaly of the daylight exterior dropped out of the repertoire of image making. As far as the images of the individual personalities were concerned, they effectively floated on these largely undefined backgrounds, became separate symbols themselves and could have local modelling of clothing and features with little need to reflect any sense of effective external illumination. By the 9th century in Roman mosaics they were simplistically

depicted. Features were indicated as linear forms, with little pretence at modelling to mimic light, and robes were similarly simply stated.³¹ What articulation of faces there was showed minimal repetition of standard techniques which could continue to unthinkingly reflect a token copy of original directional modelling from the distant past [Pl.66]. But even here, as later poses became more hieratic and frontal, the final results still had simple light accents for features and a superficial glance would see light and projection as seemingly coincidental. By the 12th and 13th century theory, tradition and practice all seemingly accepted the idea that in pictorially terms light tones advanced and dark tones receded. There is every indication that an unquestioning application of the rule caused problems for Duecento and Trecento painters as they tried to reconcile its results with their observation of natural phenomena.

Possible Origins of the Convention and the Perpetuation of the notion that Light tones signify Projection and Dark ones Recession

With some free interpretation of antique painters' working, we might bring theory and practice together. The question would then arise how and when did this conventional notion of light and dark equating with prominence and recession arise in painting. The rule was clearly axiomatic even in the first century when Pliny repeats it as a commonplace in c.70 A.D.,³² with no indication of its likely origin. But taken at face value the convention is one arising in painting. Some conjecture then has arisen over the origin of this practice. One interesting suggestion is that of Gombrich, who felt he might discern, in a legendary anecdote in Pliny's *Natural History*, Bk.XXXV, the use and possibly the hand of the originator of this way of working in the 4th century B.C.³³ The story involves a competition between Apelles and Protogenes. Their

painting involved three successive thin lines. The first, laid down by Apelles, had a second thinner line added on top by Protogenes, but the sequence was firmly completed by the addition of a third, white, line placed centrally by Apelles. Gombrich's suggestion is that this completed the illusion of a thin rod with a highlight lifting its implied contours out of the panel, and that Protogenes had no way of adding anything of significance to the painting. The tale was then taken to prove the origin of the painting rule of thumb that lighter tones, and white as the lightest, advanced towards the eye while darker tones appear to recede. The story might show a possible use of the technique, but nearly a century before Apelles, Apollodorus had been painting in a manner which would subsequently earned him the sobriquet *skiagraphos* (see p.101-102 above), and from this it is clear that some form of depiction of light and shade was established and evidently effective before Apelles painted in the late 4th century. There is also the criticism, by Plato (died c.348 B.C.), of the illusions generated effectively by the use of light and shade, or *skiagraphia*, when he condemns these for the "deception" involved.³⁴ It seems more likely, then, that a tonal modelling system, presumably one with the standard approach, was already a common tool in painters' craft well before Apelles time.

An alternative starting point could have been the late 6th century in Greece, about two centuries earlier than Apelles. An important landmark then was the first use of Red Figure vase painting, which marked a real change in the fundamental approach to matters of tone in depicting figures. Around 530 B.C. this new technique replaced Black Figure, where the decoration on Greek pottery had presented figures as dark silhouettes against the unpainted, reserve, surface of lighter tone.³⁵ The new way of working reversed the procedure with the figures unpainted, apart from internal linear detail. The surrounding area was then painted to provide, on firing, a plain black

background to the reddish or cream coloured baked clay of the areas of design and figures. The result allowed for the suggestion that these figures, now of a more natural tone, could stand out from the black background which assumes an indeterminate depth. Boardman suggests such “figures stand spot-lighted on a narrow stage.”³⁶

All this might suggest that our convention, at least in that it affects vase painting, was a happy accident. However, there are other more positive sources of inspiration which might have prompted this watershed in vase painting.

A convincing theory of the origin of Red Figure painting is suggested by Boardman.³⁷ He considers that the technique could have had contemporary relief sculpture as a formative example. It was common practice for relief sculpture of the time to have the background painted dark red or blue leaving the figures in white marble, or with some features picked out in washes of colour. Red Figure vase painting gives the same effect in tonal terms. It is also quite possible that some of the artists practised both forms of art. Certainly the sculptor would have mapped out or scribed his intentions on the marble before carving and must then have visualised the final effect as he did so. Initial sketching and any visualising of the final colour treatment could not fail to provide a mental image which exactly parallels the effect of Red figure work. There was, too, a growing use of relief sculpture on Athenian buildings during the second half of the 6th century B.C. It was becoming a major feature of building decoration. Grave stelai were yet another area with similar techniques, for with very low relief being provided on some of these there was a consequential need for colour to help emphasis the design, and indeed some stelai had no carving, just painted figures with dark backgrounds exactly like Red Figure. So the advent of Athenian Red Figure occurs at a time when figurative sculptors were using

dark background colour to accentuate the difference between the planes in relatively shallow relief work.

It was, however, not only by virtue of painted backgrounds that relief sculptural works provided a suitable display of tonal separation. These, painted or not, would be seen to best advantage when light struck them at oblique angles so that the figures as the most prominent parts would be modelled by the light while their supporting background plane was shaded. The message for the painter was there to be seen and is still available to us in surviving sculptures metopes and stelai. The most effective image had the foreground items light and its background dark.

A more recent theory put forward by Vickers and Gill, still much debated, is that vase painting was not really an original art in itself, but merely aped the design and decoration seen on expensive metal-work pots.³⁸ Here the necessary figures or decoration would be applied to or created, repoussé fashion, by embossing the sides of metal vases and pots. If we see the vase painter involved in trying to copy such work, or even if he were merely taking an intelligent interest in another fellow craft, we would find him faced with a three dimensional model, albeit in low relief, where the subject matter stands proud of the main surface. The prominent elements would catch the light and the defining shapes of the foreground would stand out against a darker background. Such an assessment would follow more often than not, since the natural way to view such work is, I suggest, to move it, or oneself, to a suitable position which minimised any glare from the flat unarticulated metal of the background plane, leaving the undulations of the projecting motifs to reflect the light. The significant elements of the decoration then clearly appear as lighter items, or at least as items with brighter prominences, on a darker field. The attention of the vase painter is now focused on lighter items which project towards him from a supporting darker ground.

It would be quite reasonable for him to consider it worthwhile to try to follow this tonal separation in broad terms, as light on dark, when attempting to offer pottery versions.

But Vickers and Gill go on to develop their theory further and specify a particular type of vase and decoration which they suggest provided a direct model for Red Figure work. In these a thin applied design, in gold leaf, decorated a silver vessel.³⁹ The fact that, in this case, the design was laid out in thin gold leaf means that there was no relief to follow. In which case a vase painter did not have to make a conscious appraisal of any applied figures as being physically proud of the dark background since the gold was in effect of such delicate thinness that it was, to the eye, virtually on the same plane as the supporting silver. So this form of vase with its rich embellishment, in prompting cheaper ceramic imitations, with straight forward tonal equivalents, light for gold and dark for oxidised silver, would naturally lead painters directly towards the Red Figure style. In this instance the vase technique which mechanically copied precious metal vessels, rather rules out any *direct* attempt by painters to follow relief in tonal analogue. But the effect might still stimulate the suggestion of distance with the darker background.

A big problem for any suggestion that the late 6th century, with its Red Figure working, painted metopes and stelai, saw the first serious acceptance of a “light tones advances and dark tones recede” notion for painters is that, from then until the time when Apollodorus, c.408, was credited with the invention of *skiagraphia*, more than a century would have elapsed.⁴⁰ There is also still a 50 year gap if the alternative ideas of Vickers and Gill are accepted.⁴¹ Then a further interval occurs before there are signs or written hints of dark backgrounds in monumental painting or mosaics, with the examples in Pella and the reported innovations of Nikias, appearing in the closing decades of the 4th century B.C. There is a difference between Apollodorus and Nikias

in that the former was, by all accounts, concerned with shaded detail within his figures while the second was is noted for his treatment of the background relative to his figures. Any consideration that the influence of relief sculpture on Red Figure vase painting practice could have produced the first important step towards a theory and practice of simulating depth by tonal values gets lost in this chronology. Nevertheless, the idea behind such a notion, that painters looked to relief work for guidance on shading, while it might not have been the impetus which originated the concept, is still available to support its continued employment in the studio and the persistence of the “light tones advance dark tones recede” theory.

But there is in this still no real answer to the question of what prompted Apollodorus and Nikias. Even so, the model of recession and projection in the sculptor’s craft or its imitation in Red Figure, or even bypassing this in nature through simple direct observation, is still a more likely influence than any expression of abstract theory. Any formal theory as it affected pictures more likely came after the art, which for its particular purposes intuitively developed its own techniques. With the intellectual need of philosophers, particularly at this time in the era of Aristotle, to provide some rational explanations, and to reduce everything to natural laws, a considered theory of light when it arose might well have been seen as applying to painting, not derived from it. In consequence it could be seen to “fit where it touched” and selective examples used to illustrate and support the theory.

However, even if relief works, in sculptural panels or repoussé metalwork, did not provide models to actually initiate the concept of “light tones advance and dark tones recede” in ancient times, such work could continue to offer supporting illustration of this idea, which became axiomatic, on through antiquity and into late medieval times. If we wish to see relief sculpture’s effectiveness in the Italian

Duecento, when painters were looking for the simulation of depth, we can find suitable examples not just in surviving antique panels, for instance in Pisa's Campo Santo, but also, perhaps more appropriately, in the contemporary work of the Pisani and their associates.

Nicola Pisano and his workshop in the mid 13th century appeared in the vanguard of the renewed concern for naturalistic art. They drew attention to the antique survivals which influenced them in places like the Campo Santo, and also left prestigious examples of their own work in important churches. The 1265-68 Siena Duomo pulpit [Pl.27], for instance, carries relief panels in a prominent location to dramatically offer Sienese painters a confirming and practical illustration of the evident truth of lightness equating with projection. Its position, with panels on its south side facing into the crossing, offers these to the raking light of the great east window. The oblique light from this window exaggerates the relief. It accentuates the figures while leaving the sunken background dark. Here in a highly respected work is a very effective demonstration of the "proof" of the concept that light tones advance and dark tones recede.

A still more direct interconnection between sculpture and painting is to be found in a Sienese work of the early Duecento, which points emphatically to the way an artist of the period could rely on the concept of lighter and darker tones indicating projection and recession and actually apply it in practice. The *Madonna degli occhi grossi* [Pl.28], a composite of relief and painting, is a Nikopeia type Madonna with the Infant Christ as a mannikin held centrally in front of her.⁴² Both look straight out. The relief is extremely low and carried out to broadly, but softly, to follow the main contours of the figures and their faces. Other painted sculpture of the Duecento, like the later Coppo di Marcovaldo *Virgin and Child* in Sta. Maria Maggiore, Florence, had

flat colouring and relied on the more representative physical contours of the carving to present its three dimensions. Here the painter stresses the recession and projection of the minimal relief with tonal variations. Apart from red “roses” added for the cheeks a basic flesh colour was maintained as a base over which some subtle neutral and saturation variants were applied. Gently graded tonal alterations are added to both faces, to darken under the chin and eye-brows. Also there is gentle darker shading around the forehead. Broad highlights are added, too, on the brow above the eyebrows, centrally on the nose and equally over each nostril. The upper lip and chin carry central highlights. All these tonal accents, light and dark, are softly merged with the base flesh colour to avoid any sharp edges. They are all executed centrally and symmetrically around, or on, each low prominence or concavity to correspond to the local height and depth of each feature as viewed directly from the front. The painting, like a softly articulated relief map, is a unmistakable display of 13th century understanding that light’s effects produced variations in tonal values which would follow the rise and fall of a depicted object. It is worth noting that for the illustration used here [Pl.28], the panel has been photographed to present it as much as possible as a painting. The lighting employed was obliquely provided from each side so that any extraneous highlights would not be generated in the central facial areas nor from the gold background. Nonetheless in the process some unavoidable highlights resulted. These are particularly discernible on each side of Mary’s *maphorion*. on the sides of Her shoulders and on Her right knee.

Chapter 2 Notes

- 1: White, *op.cit.* (*Perspective in Ancient Drawing*), p.9.
- 2: M.Andronikos, *Vergina, The Royal Tombs and the Ancient City*, Athens, 1987, and *Vergina II: The Tomb of Persephone*, Athens, 1994. P.Petsas, *Pella, Thessalonica*, 1978.
- 3: Pliny, *op.cit.*, Bk.XXXV.56, pp.302-3. The Latin is, “hic (Cimon) catagrapha invenit, hoc est obliquas imagines, et varie formare voltus, respicientes suspicientesve vel despicientes.” There is some ambiguity in this with *κατάγραφα* translated into Latin as ‘obliquas imagines’ such that it could mean ‘profile’, and there is another instance, *ibid.*, Bk XXXV. 90, p.326-327 where ‘obliquam namque fecit’ could also imply execution in profile (to hide the disfigurement of King Antigonos’ lost eye). The dubiety was discussed in K.Jex-Blake & E.Sellers, *The Elder Pliny’s Chapters on the History of Art*, London, 1896, p.101 note 16 and p.126 note 9, with the point made that the use of ‘profile’ as a notable invention in both cases hardly merits its recording as such and, in any case, a further point is made, *ibid.* p.101, that the Greek term is “susceptible of meaning *foreshortening*” Pollitt *op.cit.*, p.76 & p 108 note 8 accepts it as meaning foreshortening without further comment.
- 4: G.M.A.Richter, *A Handbook of Greek Art*, London, 1987, p.276.
- 5: M.Robertson, *A History of Greek Art*, Cambridge, 1975, Vol. I, pp. 253ff. links the *Niobid Vase* with the detailed descriptions of lost wall paintings by Polygnotus.
- 6: Pliny, *op.cit.*, Bk.XXXV.60, pp 306-307, writes that Apollodorus was “*primus species exprimere*”. Pollitt, *op.cit.*, pp.220-221, notes that, while Pliny did not refer to Apollodorus as *skiagraphos*, this name was used in antiquity as a recognised sobriquet, as in Scholia *Iliad* 10.265, “Ἀπολλοδώρου ὁ σκιαγράφος” — E.Maas, *Scholia Graeca in Homeri Iliadem* (Oxford, 1878), vol.5.
- 7: Plutarch, *Plutarch’s Moralia*, IV, 263D-351B, trans. F.C.Babbitt, London, 1972, (*De glor. Ath.* 346a), pp. 494-495, “... Ἀπολλόδωρος ὁ ζωγράφος, ἀνθρώπων πρῶτος ἐξευρὼν φθορὰν καὶ ἀπόχρωσιν σκιᾶς. . .” Pollitt, *op.cit.*, p.221, interprets this as, “The ‘fading out’ or gradations (φθοράν) and the ‘laying on’ or ‘building up’ (ἀπόχρωσιν) of shades of color were clearly the means that Apollodorus employed to give the impression of ‘shadow’ . . .”
- 8: Pliny, *op.cit.*, Bk.XXXV.61, pp.306-307. V.J.Bruno, *Form and Colour in Greek Painting*, London, 1977, pp. 28-29, suggests some variation between the techniques of the two, Apollodorus’ being more linear and Zeuxis’ more painterly, and that the two approaches carried on independently. pp.31-40 discusses a later controversy between the merits of Zeuxis and Parrhasius where the latter was noted for continuing the linear traditions, perhaps in the manner of Apollodorus.
- 9: Pollitt, *op.cit.*, p.223, discusses Plato’s objections, and pp.218-219, quotes Plato’s *Republic* 602D.
- 10: *Ibid.*, p.251. and note.8 above.
- 11: Pliny, *op.cit.*, Bk.XXXV.131, p.357.
- 12: Pollitt, *op.cit.*, p.222.
- 13: Pliny, *op.cit.*, Bk.XXXV.79, p.319.
- 14: Andronikos, *op.cit.* (*Vergina II*), .
- 15: Pliny, *op.cit.*, Bk XXXV.29, pp.280-283.
- 16: *Ibid.*, Bk.XXXV.29, pp.282-283. “Postea deinde adiectus est splendor, alius hic quam lumen”.

- 17: *Ibid.*, Bk.XXXV.126-127, p.355.
- 18: *Ibid.*, BkXXXV.127, p.354. The text is, "Dein, cum omnes quae volunt eminentia videri, candicanti faciant colore, quae condunt, nigro, hic totem bovem atri coloris fecit umbraeque corpus ex ipsa dedit, magna prorsus arte in aequo extantia ostendente et in confracto solida omnia." The Rackham translation, *ibid.*, p.355, of "condunt" as "to keep less obvious" misses the point where the alternative sense of "withdraw" more appropriately balances "eminentia videri". Additionally the translation of "in confracto" as "on a broken ground" misses the point of light breaking up on the black hide and being reflected, which is a more likely interpretation, as is suggested by Pollitt, *op.cit.*, p.229.
- 19: A.C.Carpicei & L.Pennino, *Paestum and Velia, Today and 2500 Years Ago*, Salerno, 1992, pp.91-93.
- 20: Andronikos, *op.cit.* (*Vergina*), covers excavations and finds from 1977 onwards.
- 21: *Ibid.*, p.114, notes the colours found on the facade, and Andronikos, *op.cit.* (*Vergina II*), pp.49-69, describes the various colours in the tomb painting.
- 22: Andronikos, *op.cit.* (*Vergina*), pp.22 & 37.
- 23: Andronikos, *op.cit.* (*Vergina II*), pp.126-130.
- 24: Petsas, *op.cit.*, covers excavation and mosaics.
- 25: That it is a copy of a late 4th century Hellenistic painting is generally agreed. Attributions of the original work vary, Philoxenus of Eretria, Aristides of Thebes or Apelles are variously suggested, but Pliny, *op.cit.*, Bk.XXXV.110, p.342, tells of a celebrated, "*nullis postferenda*", version of a battle between Alexander and Darius which makes Philoxenus the likely candidate.
- 26: The tradition that some early painters restricted their palette to four colours is commonly repeated. Pliny, *ibid.*, Bk.XXXV.50, p.299, and Bk.XXXV.92, p.329.
- 27: R.Ling, *Roman Painting*, Cambridge, 2nd edition, 1991, p.128, sees the *Alexander Mosaic* as the product of a very accurate pattern book process of copying.
- 28: *The Letters of Pliny the Younger*, trans. B.Radice, London, 1969, pp.167-168.
- 29: Strictly it was not an edict nor issued at Milan, but an agreement between Constantine and Licinius recognised Christianity and gave equal tolerance to all religions. (*Oxford Dictionary of The Christian Church*, ed., F.L.Cross & E.A.Livingstone, 2nd edition, Oxford, 1974.)
- 30: Pollitt, *op.cit.*, pp.55-58, outlines of features of the *Enneads* of Plotinus as they affected late antique thinking and consequently early Christian art. Plotinus was not a Christian but Neoplatonic ideas were taken up by early Church Fathers. For example, St.Augustine was much influenced by Platonic and Neoplatonic ideas. A student of Platonic philosophy before accepting Christianity he saw parallels between the two and developed such ideas in his influential Christian theology. Platonic ideas, close to the comprehension of God in John's Gospel, he found in "certain books of the Platonists" where he read "not indeed in the self same words, but to the same purpose, persuaded by many reasons, and of several kinds, that In the beginning was the Word, and the Word was with God, and that Word was God . . ." (*St.Augustine's Confessions*, trans. W Watts, 2 Vol., Vol I, Bk VII Chapter IX, pp. 364-5). In *De Civitate Dei* he states "there are none who come nearer us than the Platonists," (*St.Augustine's City of God*, trans. J.W.C.Wand, London, 1963). In *De Vera Religione*, he says that if they could have their life over again with us . . . they would have become Christians, with the change of a few words and statements. "Itaque si hanc vitam illi viri nobiscum rursum agere potuissent . . . et paucis mutatis verbis atque sententiis christiani fierent." (*S. Aur. Augustini Hipponensis Episcopi, Opera Omnia*, Benedictine Edition, Paris 1836,

- Bk I *De Vera Religione*, ch.7 p.1211.) For Plotinus, his life and teaching, see *Cambridge History of Later Greek and Early Medieval Philosophy* ed. A.H. Armstrong, Cambridge, 1967. Ch. 13 & 14, while, *ibid.*, Ch.21, pp 343-346, tells of St. Augustine's views on the relationship between Platonism and Christianity.
- 31: See Introduction Chapter p. 47, note 15.
 - 32: Pliny, *op.cit.*, Bk.XXXV 127, and see note 18 above.
 - 33: *Ibid.*, Bk.XXXV 81-83, with Gombrich, *op.cit.* (*Heritage*), pp.14-15, giving an interpretation of this.
 - 34: Pollitt, *op.cit.*, p.223, and quotes p.219 Plato, *Republic*, 602D, "... *skiagraphia* ... turns out to be nothing short of sorcery and sleight of hand ...".
 - 35: J.Boardman, *Athenian Red Figure Vases: The Archaic Period*, London, 1975, p.11.
 - 36: *Ibid.*, p.14.
 - 37: *Ibid.*, p.14.
 - 38: M.Vickers & D.Gill, *Artful Crafts*, Oxford, 1994. Offers the case for vase painting being a derivative art following the example of gold and silver smiths, while M.Robertson, *The Art of Vase Painting in Classical Athens*, Cambridge, 1992, pp.4-5 and *passim*, contests their claims.
 - 39: Vickers and Gill, *op.cit.*, p.126-129.
 - 40: Pliny, *op.cit.*, Bk.XXXV 60, dates Apollodorus as 93rd Olympiad, 408-405 B.C.
 - 41: Vickers & Gill's theory requires adjustments to traditionally accepted chronology. For them the costly metal work examples to be copied appear in the 470's B.C. with an increase in Athenian wealth following the successful conclusion of the co-temporal Persian wars.
 - 42: Although the illustrated panel is displayed in the Museo del'Opera del Duomo with the title *Madonna degli occhi grossi*, there has been some confusion over its claim to the name. E.B.Garrison, *Studies in the History of Medieval Painting*, Vol. IV, 1993, pp.6-11, recently investigated the history of this painting and also that of the *Madonna del Voto*. Documents showed that the *Madonna del Voto* was termed the *Madonna degli occhi grossi* in a 1423 inventory and that both it and the one now in the museum were at different times also called the *Madonna delle Grazie*. This latter title was likely to have been the original name for our illustrated panel, being derived from the altar on which it was to be found in the mid Duecento. Garrison tentatively suggests, *ibid.* p.7, that "As far then as records now known are concerned it seems perfectly permissible to believe that the Opera Madonna was never on the high altar, that she was for at least sometime before 1260 on a special *altare delle Grazie*, and that the veneration and supplication on the eve of the Battle of 1260 (Montaperti), were in part carried out before this altar." Given this, as far as dates are concerned it seems likely that as the *Madonna* would have been established and revered for some time before Montaperti and so c.1240 or earlier is appropriate. At the same time, W.H.Van Os, *Sienese Altarpieces 1215-1460*, Vol.1, 1215-1344, Groningen,1984, p.12, sees it related closely in style and iconography to the *Madonna of Tressa* which he dates as early 13th century. Additionally, *ibid.* p.12, he considers it to be so similar in style and technique to a *Magister Domini*, dated 1215, that he considers "both works must be dated to the same period." Garrison, *op.cit.*, p.8, also considers it to be by the master of the *Madonna of Tressa*, and notes that like this work it would have originally been the centre portion of a horizontal dossal which was cut down.

CHAPTER 3

FACES

Emergence of naturalistic treatment in Italian painting

While a number of different approaches to the depiction of faces can be observed in those few paintings surviving from the late 12th century or the first half of the 13th century, significant signs of the emergence of some semblance of naturalistic working do not appear until about two thirds of the way through the 13th century. The recently restored paintings in the Sancta Sanctorum, dating from c.1278-80, appear as helpful and suitable examples of a renewed interest in the illusionistic depiction of human features at this critical juncture in Italian painting. The frescoes in this the papal chapel of the old Lateran Palace were carried out for Pope Nicholas III, between 1278 and 1280, in a building seemingly redeveloped with frescoes in mind.¹ Their execution brought an experienced but very varied group of mid-Duecento masters together, in an “eclectic atelier”.² The many hands, and hence variety of techniques, involved are thought to result from a wish to have the work completed in a relatively short time. The whole project was planned and completed in little more than two years.³ The resulting compendium of practices in this combination of paintings, besides offering us illustrations of what was current in Rome at this time, points to the various influences which had helped form their diverse styles and techniques, and the varied techniques are indicative of the developments, and thus, in a very practical sense, illustrate the technical discussion taking place in the latter half of the Duecento. In this the murals offer a range of techniques with potential to influence painters in the late Duecento and early Trecento. Importantly, they remain available to us as references against which to track any subsequent developments.

Sancta Sanctorum paintings

The principal mural work is a split illustration, effectively a diptych, of the votive presentation of a model of the Chapel itself to Christ [Pl.144]. The donor, Nicholas III, and the accompanying SS.Peter and Paul occupy one section of fresco [Pl.145]. An enthroned Christ [Pl.147] is depicted ready to accept the gift on the other. The ensemble is essentially a narrative, but the division, isolating Christ in his own domain with only angels attending his throne, give this depiction the force of a hieratic work. Other walls carry scenes narrating the martyrdoms of Peter, Paul and other Saints.

The Majestic Christ looking nearly straight out and full face, is close to being a formal Byzantine *Pantocrator*, though the right hand, rather than blessing, is extended in acceptance towards Nicholas and his gift.⁴ The pose is virtually frontal with just a slight turn of the eyes towards the approaching Pope. Two other images in the chapel offer versions of this traditional hieratic presentation, a 13th century mosaic on the vault above the altar recess and *L'Acheropita*, an older icon of *Christ*, [Pl.158] on the altar itself.⁵ Indeed the latter is suggested as a prototype for the fresco.⁶ A quite traditional hieratic icon, it is thought to date from the fifth or sixth century and has substantial documentation indicating its important presence there in the mid-8th century.⁷ Balancing the Christ fresco the other leaf of the effective diptych has a more narrative approach. The tableau of Saints and Pope moves towards Christ with a token model of the Chapel. The other three walls then carry six narrative scenes illustrating the martyrdoms of Saints Peter, Paul, Lawrence, Stephen and Agnes, together with one showing the anecdote of St Nicholas' dowry to the three poor maidens. There is thus, in effect, a range of genre, from the historic hieratic in

L'Acheropita through more “modern” interpretations of this, to donor portrait, and on to different levels of narrative.

The variety of practices involved in these mid-Duecento works is noticeable. In the technical procedures alone, Bruno Zanardi, who supervised the recent cleaning and restoration, noted four main modes of working. Three used an initial base of green under-painting; then each exhibited different handling of the pigments on top to model the flesh tones, with brush work varying from broad and free to neatly precise. The fourth, however, avoiding any green preparatory working, employed a flesh coloured base and modelled the tones around that.⁸ The diversity presented prompted Serena Romano to consider that in some areas, for example the St. Agnes fresco, “a patchwork of techniques is most obvious, which affected both the composite quality and coherence of the whole.”⁹ Such combinations provide a fruitful source of study for us and a wide selection of models which future workers could continue to use as guidance in the developing painting of the late 13th and early 14th centuries. The Chapel itself is, for Romano, illustrative of the potential of such associations, and she sees it as exhibiting “a syncretic tendency which allowed for the convergence of a variety of ways of working, and the frescoes in some measure show this.”¹⁰ So while some diversity is noticeable, in the syncretism similarities are also becoming apparent. The various approaches are all working towards a convincing description of solid rounded heads and faces, with the modulation of tones offering a reasonable imitation of the effects of light falling on human features. A noticeable realisation of illusion is beginning to emerge, and common procedures are evolving. The *Sancta Sanctorum* illustrates a turning point in this evolution as far as Italian painting is concerned. The *Enthroned Christ* [Pl. 148] demonstrates a smoothly modelled face, largely built on brush work, and points to the painterly future and the emergence of a tonal control of

volume which renders the linear preparation superfluous. It contrasts with the obsolescence of the linearly defined executioners in the *Martyrdom of St Stephen* [Pl.156]. The paintings of SS. Peter and Paul are intermediate forms, still part linear, but looking to broader light and shade.

The imposing Christ [Pl.148] is carried out with refined skill. Such quality of execution on that most important wall above the altar is considered by, Romano as evidence of the work of the “the master of the of the workshop, in any case the most accomplished artist,”¹¹ while Bellosi suggests that it was the precocious work of a talented junior, the young Torriti.¹² The sense of volume relies very much on shading and colour. In its painterly execution the finished face betrays little sign of any dependence, in suggesting three dimensions, on linear working, even if graphic expertise is obvious in precise drawing of formal details of features, like the eyes and mouth. It is evident in the subtly controlled but precisely reported modelling of shading and highlights, as they follow an implied light arriving from just to Christ’s proper right, that the artist is working with attention to natural effects. The general handling of the eyes and the brow might tell of standard formal patterns being copied, though the subtle foreshortening in the eyes must hint at the perceptiveness of live observation in some of the drawing. In contrast, the accurate and coherent placing of the asymmetrical highlights, for example on the tip of the nose, above just one nostril and in the details of the lower eyelids, suggest actual perception of real effects. They cannot equate with any sense of relief based on the lighter tones corresponding to different surfaces’ heights above a notional image ground plane, as the concept of “light advances dark recedes” would require. The directional sense implied by these highlights contradicts any idea of object centred relief, for it requires some feeling for the orientation of incident light. Nonetheless, the perfectly balanced shading at either

side of the nearly symmetrical cheeks could tell of some initial “making before matching” and give some indication of a possible recourse to the idea of distance, even locally, being represented as lower in tonal value. As opposed to this, the tonal values on either side of the nose are clearly observed differentially and must be seen as planes in recession rather than more distant surfaces, while as noted already the carefully placed highlights disclose some sensitivity to directional light and show a real sense of a separate appreciation of general tonal modelling and the effects of specular reflection (see Chapter 1, p.54). It is possible that any such observation could have been in the distant past, and established exemplars could still be being followed very minutely. But there is in this accomplished work every sign that it was not a simple matter of mechanically copying a model. An intelligent appreciation of the physical rationale behind any such exemplar’s construction is evident, with some reinforcement of this provided through personal attention to actual phenomena.

There are indications of another practice employed in the pursuit of semblances of light and shade. The red-green effect most noticeable on either side of the nose illustrates a wide spread practice, of some long standing (see Chapter 1, pp.86-89), which is later documented in Cennini’s *Il Libro dell’Arte* and noted by Zanardi for three of the main Sancta Sanctorum workers.¹³ The underpainting is green and the characteristic flesh colouring, a reddish pink or “incarnazione”, as Cennini will note it is appropriately termed in Italian,¹⁴ is used for the darker shadowed areas of the face and then, in graded mixes with white, to model up to the lighter planes. The technique here, as Cennini later recommends, deliberately lets the green background just show through the flesh tones particularly in the deepest shadows.¹⁵ The effect in this case, leaving this complementary green to heighten the perceived contrast, is noticeable, but not intrusive. Thus some balance between traditional practice and some naturalistic

adventure is obvious here. The habitual patterns resulting from the former would seem to be enlivened by specific references to life through the conscious recording of natural accidents of light.

The “pendant” votive narrative of Saints Peter and Paul and Pope Nicholas [Pl.145] also demonstrates some likely composite approaches, not just following some established patterns and practices, but also working with an eye on real life. The two Saints follow stereotypical models for Peter and Paul established over the previous centuries. These forms are executed with some linear emphasis which firmly underlines their orthodoxy. The faces are segmented into linearly defined areas of graded tone, and contouring of the face, particularly for Peter, is suggested by firm lines. This linearly assertive working of the two Saints’ faces meant that these characters could be readily recognised from ground level several metres below. In lighting terms the built up pattern of lines and tonal planes implies a source of illumination just to left of centre. Between them the image of the 13th century Pope, while also somewhat schematic and linearly defined, has individual detailing to speak of close attention to a live model. While there had been other “papal portraits” — a series of busts were part of the frescoed decoration of S Paolo fuori le Mura — these tended to be mere tokens of the office as opposed to the sense here of something closer to true portraiture of an individual, prompting Romano to consider this to be a quite original depiction of an individual, and while accepting that perhaps some sculpture had reached a similar level of originality she could not think of another previous or contemporary example of central Italian painting to match it.¹⁶

Still further examples of variation in technique are seen in the depiction of Saints Paul, and Peter. Peter’s face [Pl.146] shows one variation most plainly. Where the image of Christ had its green under-painting shining through the later applications of

facial tones, for Peter the green has clearly been applied or positively reinforced, in the *later* stages of modelling. Some balancing red, along with dark neutral touches, was also added to intensify the drawing and shading. Both red and green were applied in relatively saturated forms, with obvious linear emphasis. Alternative working, relying more on blending tones through the fluid use of the brush, but still with a green foundation, appears for the depiction of Decius in the *Martyrdom of St Lawrence* [Pl.150] This has smoother, more painterly, facial modelling and no aggressive linear reinforcement. The fourth mode of colour working, noted by Zanardi, as for the old man's face in the *St. Nicholas* narrative [Pl.157], avoids green underpainting, using a range of flesh coloured tones for both base and modelling.¹⁷

There are wide variations among these eight frescoes in the subtle use of the brush to provide smooth modelling gradations and this is indicative of the nature of Duecento developments in painting. As already noted Christ [Pl.148], or Decius [Pl.150], show a soft painterly effect. These contrast with a decidedly hard geometric linearity, segmenting faces into sharply defined areas of tone, which is employed for the executioners in the *Martyrdom of St Stephen* [Pl.156], but, then, the latter are noticeably stylised in other ways, their garments and pose being quite rhythmically schematic. This sign of older practices with formula-based treatment serves to point up the clear aspirations towards a realistic depiction in the other frescoes, drawing attention to the nature of their successes. In all this variety we are not just looking at tentative experiments, but can see among them already refined techniques, handled with the confidence of practised masters, which will influence subsequent development.

The developments of late Duecento painting are fully demonstrated here. A move from linearly defined figures and faces towards the freedom of painterly

modelling offers the prospect of naturalistic depiction which will reach a satisfying level of illusionistic representation of faces generally across Italian painting by the end of the century, as illustrated in the work of Cavallini, Torriti and in the frescoes of S.Francesco in Assisi.

The Decoration of S.Francesco in Assisi

With some allusions already made to works in S.Francesco in Assisi and with further important comparisons to come it is appropriate to look at the development of the decoration there, particularly in the Upper Church.

The chronology and attribution of works in S.Francesco Assisi have been subject to long and intense debate which remains unresolved in virtually all particulars. Little is recorded in existing Church documents to help in this. Only some notes on funding can help in offering guides as to likely periods of activity

The initial funding and works for the building and the early decoration of the basilica were provided for by indulgences granted by Pope Gregory IX, 1227-41, and also through the canvassing of Brother Elias the Franciscans' Minister-General from 1232 to 1239. Thereafter various papal dispensations allowed for the use of alms given at Assisi to be used in the building and embellishment S.Francesco.. Papal records report such an authorisation by Innocent IV in 1253. This was to be valid for 25 years, but a two year extension announced by Clement IV in 1266 allowed the concession to run until 1281. A further promulgation in 1288 by Nicholas IV, the first Franciscan pope, again allowed for the similar use of such offerings.¹⁸ The first mural painting, on the nave walls of the Lower Church was carried out by the so called Master of St Francis between 1253 and 1265. This is consistent with the funding initiated by Innocent IV. That this work was completed by 1265 follows from the official

acceptance of St Bonaventura's *Legenda Maior*. This determined that the orthodox iconography of St Francis' vision in the *Stigmatisation of St Francis* required a crucified Christ rather than the seraph shown in this early work.¹⁹

The first embellishment of the Upper Church saw stained glass installed in the apse during the years 1235-1250, before the church's consecration in 1253. The glazing was then extended into the transept and nave during the pontificate of Alexander IV, 1254-61.²⁰ But the walls here possibly remained unpainted until the late 1270s, for records of the 1279 Chapter General at Assisi imply that there was no decoration then.²¹ The dates of painting in the Upper Church are debated widely as is much of the attribution. There is, though, general consensus on the sequence of work in the basilica. The four basic areas of work were executed as follows : a) the transepts and choir, b) the first two to four of the upper registers of the nave and vaults, working east from the crossing, c) the remaining sections of these higher areas and the interior of the east wall, with finally d) the lower sections of the nave wall.

The transept works are generally attributed to Cimabue, though some initial work, by an unnamed northern painter, the Transalpine Master of Assisi, and with some possible contributions by Torriti, is generally noted in the upper sections of the north transept before Cimabue took charge.²² The dates involved here are subject to much conjecture. Sindona, in 1975, provided a full review and discussion of the various points of view.²³ The propositions are based on a variety of arguments, but many centre on differing interpretations of the significance of the detailing of Orsini *stemmi* on the Roman buildings in the *St. Mark Ytalia*. The suggested periods of Cimabue's activity here run from the early 1270s -- a very early placing around 1253 to coincide with the consecration of the church is universally discounted²⁴-- through 1275 and 1277-80, to 1280-90, 1285-88, then 1288-92, to 1296 and on to opinions that he did

not finish until around 1300. In the main two periods are favoured, either the last years of the 1270s and the early 1280s, before the major spell of funding from offerings ended in 1281, or starting in the late 1280s when renewed support came through Nicholas IV. Sindona himself found Monferini's arguments for c.1280-83 to be convincing.²⁵ Battisti similarly considered 1279-83 as the likely period,²⁶ and White with some hesitancy concluded that Cimabue's Assisi work "comes at the close of the seventies or in the early eighties."²⁷ A recent appraisal by Tomei sees Cimabue's work in the transepts ending with the cessation of funding in 1281.²⁸ Others look for a much later dating. Of the latter Ruf has Cimabue carrying out the work of the transept and crossing in the last decade of the 13th century.²⁹ More recently, in 1998, Bellosi, outlined the current state of discussion, but repeated his convincingly argued case for Cimabue carrying out the work roughly between 1288 and 1290 during Nicholas IV's 1288-92 pontificate.³⁰

As for the timing of the start of the nave decoration those who see the transept and apse work as being executed by the early 1280s then look for a resumption of activity in 1288 with Nicholas IV's accession and renewed funding. Of these Tomei considers the nave frescoes were started c.1288 by a workshop led by Torriti. But he believed Torriti himself was only there for a short period, no more than one painting season, before he left associates to continue the work and returned to Rome c.1289/90 to take charge of the mosaics of the Lateran apse which he completed in 1291.³¹ An alternative date for Torriti's work on the nave is offered by Bellosi. He suggests that Torriti went to Assisi in 1291, *after* finishing the Lateran apse and *before* returning to Rome to execute the Sta.Maria Maggiore mosaics which were completed by 1296.³² In this Bellosi's persuasive argument, is for a period of continuous activity in the Upper Church with a "unified decorative program" planned and followed through from

transepts and apse to end with the lower sections of the nave wall and its *Life of St. Francis* cycle.³³ This hypothesis has Cimabue starting in the transept c.1288 just after the accession of Nicholas IV, and then have his workshop moving straight on to the adjacent bays of the nave before handing over to Torriti and his workshop in 1291.³⁴ There is every indication in the first two bays to the east of the crossing that a Cimabue workshop was at work at the same time as the one led by Torriti. The *Arrest of Christ* or the *Nativity* [Pls.185 & 186] on the south wall and the *Creator* or *Noah* [Pls.163 & 164] on the north wall offer signs of such concurrent activity.

Torriti's associates continued for some indeterminate time after his departure before yet a further workshop took over from them to finish the remaining upper registers of the nave, including the end wall over the main east door. This is signalled by a dramatic change obvious in the two frescoes telling of Isaac, Jacob and Esau on the third bay of the north wall [Pls.188 & 189]. "The earlier painters were succeeded at this point by an artist of a very different stamp — the Isaac Master."³⁵ The authorship here is a matter of great contention. The identification of the Isaac Master as the young Giotto, is asserted by many scholars, Gnudi, Bellosi, Salvini, Toesca are examples, who see in the painterly approach and the feeling for near sculptural volume, through awareness of light, some unmistakable early signs of the Florentine master. This identity is firmly rejected by many others, White and Smart for instance, who while seeing the two painters have much in common consider they can not be one and the same.³⁶ The one point of agreement between the two divided parties concerns the importance of this advent of a singular new talent. Meiss who favoured the idea of identity wrote "If the Isaac Master is not Giotto, then he and not Giotto is the founder of modern painting."³⁷

The date for the Isaac Master's work and the completion of the higher levels of the nave walls is also debated. The final most easterly vault of the nave depicts *The Four Doctors of the Church* and an official declaration of their feast-day in 1298 might point to the timing of their execution. However, as White points out, the commission organising the formal acceptance of their special status was at work some years before, around 1296, and even then they were merely endorsing the age old recognition of these celebrated teachers.³⁸ But that apart other clues might be looked for. If the early Torriti timetable, which sees him painting in the nave at Assisi before 1289-90, is accepted then the change over to the Isaac Master's workshop could have been quite early in the 1290s. That assumes no interval between the two, though White suggests there is evidence for a hiatus here.³⁹ Alternatively, if Torriti's workshop did not arrive until 1291 any subsequent continuation of work following them, after any possible interval, still might not have occurred much before the middle of the 1290s, with the the upper walls of the east end of the church not being finished before a date between 1296 and 1298.

The final major programme in the Upper Church was the *Life of St. Francis* cycle on the lower walls of the nave. Debate and controversy continues here. Generally the historians who wish to have Giotto and the Isaac Master as one and the same now see that his presence is apparent in this lower fresco programme. Others like White, Smart or Offner do not see that Giotto was involved in any obviously major way.⁴⁰ For them three, or possibly four controlling masters, were involved while the hands of many assistants are evident.⁴¹ Of these the St. Cecilia Master is given credit for completing the cycle, with the final scenes, numbers 26, 27 and 28, together with scene 1, which was painted out of sequence, executed last.⁴² A nominal Master of the St. Francis Cycle, was responsible for the main part of the north wall and possibly the first

sections of the south wall, that is scenes 2-19 [Pls.191 & 207]. However, Smart sees, in distinctive style variations, evidence of a further controlling painter in the east entrance wall and adjacent frescoes on the side walls.⁴³ The remaining six frescoes, relevant to the death and burial of St.Francis, were by a painter Smart termed Master of the Obsequies of St.Francis.⁴⁴

The dating of the cycle is no less controversial than its attribution. In a concise exploration of current arguments and evidence, other than stylistic considerations,⁴⁵ White found these offered the probability that “it was carried out almost certainly after 1290-1, not necessarily after 1296, and very probably before 1307.”⁴⁶ In the end he favoured the mid 1290s as a period for their execution.⁴⁷ Smart offered a similar discussion but found it difficult to see the cycle being carried out “much earlier than 1300”⁴⁸ Certainly if we accept a dating of 1296-1298 as the best approximation of the Isaac Master’s activity, based on the *Four Doctors of the Church*, then the subsequent execution of the twenty eight lower frescoes, spread over several seasons it must be assumed, would be likely to span the closing years of the Duecento and the opening ones of the Trecento. In an alternative and radically different approach Stubblebine recently resurrected an older hypothesis, originally proposed by Rintelen in 1912 but generally rejected since, which suggested that the Assisi cycle was derivative work and painted much later.⁴⁹ He sees the cycle as dependent on and following Giotto’s developed works in the Peruzzi and Bardi chapels, and that it was begun around 1330 and not finished until the early 1340s.⁵⁰ A number of other Assisi works are re-dated in his alternative chronology. The Isaac Master’s frescoes preceded the cycle in the 1320s and Torriti’s nave frescoes are seen as carried out in the first decade of the fourteenth century.⁵¹ This somewhat eccentric theory has had little or no support, and the dubious

stylistic and iconographic arguments on which it was based were called into question almost as soon as it was published.⁵²

Of the various suggestions discussed I feel inclined, looking at the coherence of the finished programme and even allowing for the many different contributions, to accept Bellosi's idea of an integrated continuous scheme. An approximate chronology in which to locate further comparisons would then seem appropriate as :

- c.1288 Upper Church right transept begun. Transalpine Master and possibly Torriti involved in initial work.
- c.1288-1291 Cimabue takes over and with workshop executes the apse, transepts and choir vaults. The Cimabue workshop then moves on to the first bays on the south side of the nave walls.
- c.1291 Torriti workshop takes over from or works with the Cimabue workshop. Possible interval then.
- c.1295-1298 Isaac Master's workshop completes the higher walls of the east nave.
- c. 1298- c.1305 Various ateliers carry out the *Life of St.Francis Cycle*.

Antecedents and Possible Sources of Influence

The different mid to late Duecento approaches in the Sancta Sanctorum offer opportunities to look back and judge what sources might have helped or influenced this reawakening interest in naturalistic painting and the extent to which these featured in aspects of any re-invention. A survey of early works also helps to set the Duecento endeavours in a realistic context, for the painters were not spontaneously generating an entirely new art of illusion. Artists of earlier eras had already explored the simulation of lighting effects on faces and human features [Pls. 20, 21, 22 & 23]. While most of the works from these antique periods had perished some few examples survived to be

available for 13th century workers and might have offered them some idea of naturalistic depiction. But these few were unfortunately lost among a miscellany of later images which, having responded in different ways to later requirements, showed lower priorities given to naturalistic depiction.

In looking for signs of any possible antique influence one might see decorative features hinting at Roman origins. The *velum* motif above each section of fresco [Pl.144] can be traced back through early Christian apsidal mosaics to Roman examples. The mosaic from the House of Neptune and Amphitrite in Herculaneum [Pl.36] is representative of antique precedents.⁵³ Later the motif appears in inverted form, as the ‘tabernacle’ or canopy of heaven, in a number of church apses. The 4th century Constantinian St. Peter’s [Pl.44] was an early example and S.Clemente [Pl.79] or Sta.Francesca Romana [Pl.82] have 12th century examples. The urn and foliate decoration [Pl.144] similarly has a Roman pedigree, being used in pre-Christian temples [Pl.42] and continually repeated in Christian Churches, from the old St Peter’s [Pl.45] through Sta.Maria Maggiore to S.Clement [Pl.79]. Unfortunately there is no evidence of surviving paintings from this early period being available for the 13th century artist, even if later happy finds brought some to light. Some mosaics from the fourth century survived to be available through the Ducento and Trecento to demonstrate antique light and shade expertise in facial depiction. The apsidal mosaics of the Constantinian St.Peter’s, destroyed at the end of 16th century, carried some effectively illusionistic figures, if we are to judge by a surviving fragment showing St.Paul [Pl.43] now in the Vatican Grotte,⁵⁴ as did the still extant Sta.Pudenziana apse [Pls.45 & 46].⁵⁵ But the Sancta Sanctorum pictures do not follow the strong modelling in these. The dramatic oblique lighting shown for the earlier St Paul, which leaves the far side of his face fully shaded, has no echo in the Sancta Sanctorum one.

Additionally the smooth gradations of tone achieved, in spite of the less tractable nature of the mosaic, are not followed in the later St.Paul, even if elsewhere in the *Sancta Sanctorum Decius* [Pl.150] or *Enthroned Christ* [Pls.147 &148] show a similar subtle handling for different poses. The discreetly placed red tesserae [Pl.43] are indicative of the employment of a sophisticated optical mixing technique which is quite different from the red-green complementary usage seen in the later *Sancta Sanctorum* works. Then, modelling apart, the later St Paul follows the stereotypical form habitually recognised in later depictions of him, certainly from the 6th century onwards,⁵⁶ and is here quite different from the older saint pictured in the 4th century apse. So no obvious direct reference arises here. From the same era the early 5th century mosaics in the Sta.Maria Maggiore show an interest in directional light on faces and figures [Pl.47]. However their scale meant a relatively large size of tesserae and a very coarse use of these, and though the mosaicists' results were ingeniously effective in suggesting faces and figures, such very broad effects would clearly not transfer easily to painting.

Later c.530 mosaics in Rome's SS. Cosma e Damiano [Pl.53] presented a dark but balding St Paul in what would become the established type for the saint. He is presented in a frontal pose which might have offered comparisons with the *Sancta Sanctorum Christ* [Pl.148]. But a more oblique lighting, around 20°, with noticeable contrast does not match the just marginally off centre lighting and soft tonal range of the latter. Nor is there any red/green modelling, though here again the isolated touches of red are in evidence. At the same time there is little sign among the varied 5th and 6th century Ravenna mosaics that other mosaics from this period provided models directly for the *Sancta Sanctorum* workers. The figures in the mid to late 5th century Arian Baptistery rely more on highlights than on graded darker notes for modelling, while

the slightly later c.500 Neonian Baptistery [Pl.50] offers some alternative, more tonally graduated, modelling. An obvious feature of this makes more use of red tesserae, not as spots of characteristic flesh colouring, but more extensively as shading and more linearly as a means of outlining the shaded areas. In neither baptistery are there indications of green facial tesserae. Elsewhere in Ravenna's 6th century mosaics there is a very obvious turning to more frontal depiction of all characters, even in the small narrative mosaics in the upper register of S.Apollinare Nuovo [Pl.51] This is quite different from the employment of three-quarter poses seen generally for the Saints and other attendant characters in the Sancta Sanctorum. Some signs of correspondence to the frontal types might be looked for in the Sancta Sanctorum *Enthroned Christ* [Pls.147 & 148], but the faces of Justinian and his Court [Pls.59 & 60] in S.Vitale differ from the latter in their darker and wider range of tones and they have more emphatic suggestions of light from the left. S.Apollinare from the apse of S.Apollinare in Classe [Pl.62] in a higher tonal key might be a little more compatible in this respect, as he is more symmetrically set and modelled. But here again there is no hint of green facial tones. Indeed this is true both here and for the mosaics in S.Vitale.

Subsequently, surviving mosaics from the 7th through to the mid 9th century offer even less indication of helpful examples for later artists looking for facial modelling. The leaning towards frontal aspects noted for the 6th century works above was an early indication of a distinct tendency which saw the general adoption of such formal arrangements in the hieratic and authoritative figures looked for in church mosaics from the 7th century on. As these figures became more like uncomplicated symbols rather than suggestions of earthly reality, tonal modelling became largely superfluous.⁵⁷ Faces became flat areas of flesh colouring with features articulated by the minimum of lines and a token disc of local colour on each cheek. Examples of

these are, from the 7th century, the Sta. Agnese fuori le Mura apse [Pl.63], or from the 9th century that of Sta Maria in Domnica [Pl.66].

While an apparent turning away from naturalistic depiction is evident in these Roman works, and little survives to show any change in the situation over the next two or three centuries,⁵⁸ outside Italy there are some obvious signs of reawakening interest in naturalistic representation of faces and figures after the upheavals of iconoclasm. A limited number of surviving manuscripts and mosaics show that in Byzantine areas this interest developed and continued to change and vary. As a result there was in the East a continuing potential to offer assistance to Western artists, directly or indirectly through exported models or skills. In reaction to the prohibitions of iconoclasm the renewed enjoyment of painterly modelling of human figures is evident in some 9th century manuscript illustrations, for example, in the 9th century *Vision of Ezekiel* from the Homilies of St Gregory Nazianzus [Pl.103], or the 10th century Paris Psalter [Pl.105]. These obviously relied on ancient models for their handling of faces. In this they are indicative of a store of classical heritage in Constantinople, which, in their survival through the troubles of iconoclasm and over centuries of inevitable variations in style and fashion, offered a very real sense of the forms and skills of the classical past. It is also worth noting that the c.880 *Vision of Ezekiel* is an early but very definite indication of the complementary green in flesh tones. Intermittently a few signs of such revivals with classical notes appeared in the West. Immigrant artists, Greek or Greek trained, produced the Coronation Gospels for Charlemagne's court c.800,⁵⁹ including painterly images of apostles [Pl.101] with obvious antique references. Later, c.1045, the Speier Golden Gospels *Christ in Majesty* [Pl.108] had the face and hands painted by yet another Byzantine artist.⁶⁰ Again it is worth noting there is a use of complementary green in the modelling of the Christ's hands and face.

These, though, are manuscript illustrations. No monumental painting survives from this period to show developments in larger scale working. However a few surviving mosaics in Hagia Sophia in Constantinople might help here. Of the immediate post-iconoclasm period, one, *Christ and an Emperor* c.890 -910 [Pl.70] shows some strong light and shade modelling and noticeable high lights perhaps consistent with the strong and liberal reporting in the manuscript examples. But yet another mosaic in Hagia Sancta Sophia from around the end of the 10th century [Pl.71] shows a subtler, less contrasty, modelling for the Virgin and Child, with a near frontal lighting implied, while in attendance on them are the more obviously modelled Emperors Constantine and Justinian. Perhaps some priority offered to the Virgin and Child might be apparent here. They are left free of awkward and possibly intrusive shading, which was, however, seemingly acceptable in the characterisation of the Emperors. The few surviving Constantinopolitan mosaics from the 11th and 12th century are also in this hieratic vein. The lighting implied for these continues as just off-frontal and, with restricted contrast, heavy shading is avoided. Nonetheless, differences show obvious variations of style and approach over time. A decidedly linear indication of both features and contours together with an emphasis on local flesh colouring at the expense of modelling is apparent in a mid 11th century *Christ with Constantine IX and Zoe* [Pl.73], and an early 12th century *Virgin and Child with Emperor John II Comnenus and Empress Eirene* [Pl.74], shows signs of a return to tonal modelling, albeit very gently stated, with some reduced linear insistence in the definition of facial features, though a detailed look at tesserae will show these to be arranged in quite regimented “work lines”.⁶¹

Examples of narrative works do not survive in Constantinople, and we must look to provincial works for any idea of their execution. An extensive programme

with a number of narrative mosaics survives in the monastery Church at Daphni, from about the same time as the *Virgin and Child with Emperor John II Comnenus and Empress Eirene* just mentioned. It might be that a different contemporary development is apparent here, or perhaps a distinction was made between approaches to formal imperial images and narrative images, but in any case an increased animation of figures and faces, relative to the metropolitan hieratic images is evident. *The Incredulity of Thomas* [Pl.76] demonstrates this and shows how the liveliness is achieved. Effective use of light and shade is the decisive factor adding vitality and convincing shape to these figures with little recourse needed to linear contouring in the faces. A wider range of tones is now employed but, rather than any forceful use of darker tones, it is noticeable that much of the modelling relies on broad highlights, with the sheen of skin accurately reported. St. John from the *Crucifixion* [Pl.77], though perhaps somewhat hieratic in presentation, illustrates the techniques of careful blending involved. There is a subtle use of flesh tones in a modest range of pink to white tesserae. Any darker shading is offered in a neutral colour with a hint of drab green rather than in deeper pink or red. No full red appears as any accent or defining edge, and black is used to delineate features where necessary. The tesserae are set, not in too obviously regimented “work lines” to follow the contours of features, but rather more casually to offer a softer modulation of modelling tones.

Between the 1140's and the 1180's a series of mosaic programmes was provided for the Norman rulers of Sicily, in Cefalù, and at Palermo in the Cappella Palatina, the “Martorana” and Monreale Cathedral. These saw the importation of several Byzantine teams of workers at different times.⁶² Naturally with different workers over such a period variations must appear, but some consistencies do occur in facial depiction to tell of common continuing practices. Red defining lines appear again as edging

accents of characteristic flesh colour and there is throughout the schemes a recourse to “work lines” [Pls.84 & 85]. There is too a considerable difference from the subtle graduations seen in Daphni mosaics, with their more random alignment of tesserae. The modelling in faces here again takes on a linear form with contours emphasised in sharp extended lines of tone. Areas of light and shade readily becoming linearly defined segments, albeit in curvilinear forms. In this it might seem that the suggestion that a separate development strand was illustrated in Daphni was correct and its softer less stylised linear handling is not repeated in Sicily and other Constantinopolitan models were followed.

If, as noted above, there are no major surviving mosaics in Rome from the 9th to the mid 12th centuries, there was a positive attempt further south to resurrect mosaic working in Italy at the end of the 11th century. Abbot Desiderius, within a general programme of cultural revival, brought mosaicists from Constantinople to Montecassino to re-establish the art and train local craftsman.⁶³ Only fragmentary pieces of the resulting mosaics survive, but some paintings of this period, the work of local artists trained by the Greek masters, remain in Sant’Angelo in Formis near Capua [Pl.120].⁶⁴ Some broad shading is used overall to give some rounded form to each face and head. Beyond that, individual facial features are strongly schematised, with each sharply drawn and with hard edges defining areas of local colouring, as in the round edges to the rosy cheeks of younger characters or the triangular jowls of older ones. This hard linearity matches the geometric formalisation of the garments depicted. At the end of the 11th century they present a quite different approach to the smooth modulations of face tones which the near contemporary Daphni offered. Once again it is evident that there was more than one strand of development in Byzantine mosaic working at the end of the 11th century and it is a version of the more linear and

geometric one, albeit used with more subtlety than in San'Angelo in Formis, which appears later in Cefalù, and Palermo.

Signs of quickening interest in more representational rather than schematic painting Rome in the 12th century offered further and more immediate examples for the Duecento painters. S.Clemente has murals [Pl.121] produced around the beginning of the century. These display a variety of approaches with suggestions of both renewed Byzantine influence and perhaps a modified development of Montecassino works.⁶⁵ However one common factor in these, for faces as other elements, is the essentially linear addition of features over light overall modelling or even flatly painted surfaces. This was subsequently a continuing trait in 12th century image making. The apse mosaics of the middle of the century in Sta.Maria in Trastevere [Pls.80 & 81] or ^c Sta.Francesca Romana [Pl.82] demonstrate it in monumental form. It must be noted the lines involved here are essentially graphic devices, not extensions of the "work line" modelling noted in the Sicilian works above. Here, influences other than direct Byzantine sources might be discerned, and interestingly Oakeshott sees their development as being dependent on richly decorated Ottonian manuscripts rather than on any current Byzantine models.⁶⁶ The emphasis on line in facial depiction is consistent with these. Also the arcading of Sta.Francesca Romana's apse [Pls.82 & 83] with decorative pillars, and foliate capitals, certainly echoes a tradition of architectonic framing in northern manuscripts going back to the Carolingian Ada School [Pl.100]. Such linear depiction continues, for mosaic work, right to the end of the century with the c.1190 facade decoration of Sta.Maria in Trastevere [Fig.89]. But then the dependence on line and geometric schematicism is quite universal in 12th century Romanesque painting across Italy and Europe, and a similar emphasis on line-detailing on limited or non-existent modelling continues in painting through the

century and well into the Duecento. This might be seen in the c.1255 frescoes in Anagni [Pl.130], which show signs of influence from Monreale works, through immigrant workers and their pupils,⁶⁷ while in Rome itself those of S.Giovanni e Paolo [Pl.131], c.1255, demonstrate both echoes of Sta.Francesca Romana's arcading [Pls.82.& 83] and its linear stylisation in the mid 1200s.

This linear articulation of smooth countenances is all the more apparent when contrasted with the Byzantine examples of mosaic which appeared at the start of the 13th century. Here noticeable modulation of light and shade becomes apparent. Alterations were made between 1209 and 1216 to the 4th century apse of Old St.Peter's [Pl.44] by Greek craftsmen. The work included the insertion of figures of Innocent III [Pl.93] and *Ecclesia Romana*, and these survived as fragments after the apse was destroyed in rebuilding work at the end of the 16th century.⁶⁸ Various aspects of techniques already noted reappear in these together with signs of new procedures. The faces exhibit the strongly defined red cheeks of the paintings of the older stylisation in Sant'Angelo in Formis. "Work lines" follow the structure of the face. Red linear accents finish the detailing of features, and now green shading is positively employed. The olive green with a limited range of colours and tones from saturated red through pink and cream to white, allows for a substantial degree of modelling to be realised. The implied illumination remains conventionally just off-frontal. Still a few years later a more refined use of many of these techniques appeared in Rome with the arrival, following a request by Honorius III in 1218 to Doge Ziani, of two more Greek workers from Venice, where they had been working on the *Agony in the Garden* mosaic in San Marco.⁶⁹ They provided the apse mosaics of S.Paolo fuori le Mura and fragments of these survive to offer illustrations [Pl.96]. The stylised red cheeks are no longer part of working here, but the other techniques are evident in more sophisticated forms.

“Work lines”, though still in evidence, are much less emphasised as signs of pattern and facture. The flesh colours are more smoothly blended together. A more subtly effective modelling is realised, though there are still sharp transitions between these flesh coloured areas and the drab, near neutral, green shading around the nose and eyes. Red outlining is still employed to pick out facial features and outlines on the side of the face furthest from the light. But it is so finely drawn — a term normally foreign to mosaic but particularly appropriate here — that it hardly provides any contribution to the modelling, which is otherwise fully modulated, running from brown and olive through a range of pinks and creams to white. As before illumination is apparently near frontal.

Such prestigious examples available in important churches in the 1220s might be seen to have offered examples of controlled facial modelling for early and mid-Duecento artists. They do not appear to have had any noticeable lasting effect,⁷⁰ and it is not until the 1260s that anything approaching a similar level of subtlety in painting appears. This can be discerned in some few fragments of fresco [Pl.133] saved from the porch of the old St.Peter's. The porch was destroyed around 1606 in the building of the new facade. These frescoes were possibly those reported by Vasari as the work of Margaritone painted between c.1261-64 during Urban IV's papacy.⁷¹ Such dating and attribution is questioned. A number of recent opinions consider that a later date is more likely, probably during 1279-80, the last year of Nicholas III's pontificate, with even a suggestion that they could be slightly later than the Sancta Sanctorum frescoes, and in addition there is some suggestion that the fragments are Torriti's work.⁷² But in comparison with the Sancta Sanctorum Christ [Pl.148], noted above p. 130 as possibly by a young Torriti, it is very difficult to see the porch St.Paul [Pl.133] as by the same artist at around the same time. Apart from these fragments which still retain some

dependence on line, the first signs of serious attempts at painted illusionistic facial modelling return us to the Sancta Sanctorum and the late 1270's. The painting of the early to mid Duecento as already noted continued to reflect older patterns and it was the linear forms, or formalised geometry defined linearly, which characterised many paintings of the first half of the 13th century.

Another, if slightly earlier, intermediate step towards modelling in facial depiction is perhaps to be seen in the c.1246 St Sylvester chapel murals at SS.Quattro Coronati [Pl.128]. These have signs of connections with the 12th century mosaics of Monreale.⁷³ One significant aspect of such a connection and the change of medium, as it affects facial modelling, is the translation of the mosaic "work lines" into brush strokes. Linear outlining is still in evidence, though here black completely replaces the mosaics' red outlines. The result is still decidedly linear and geometric. Nevertheless, in its segmented shading it could be moving towards a presentation in light and shade of the detailed rise and fall of facial features. While these SS.Quattro Coronati facial methods were probably derived from mosaic working traits they are also similar to other forms of facial handling in painting of the first half of the 13th century. The work of Bonaventura Berlinghieri, as in his *St.Francis and Scenes from his Life* [Pl.123] of 1235, shows similar resort to distinctly defined lines, offering discreet planes in facial tones, and the later altarpiece by the Bardi St Francis Master [Pl.125] depends on sharply made divisions and graphic highlights for its suggestion of the rise and fall of distinct planes in facial detail. Significantly the only textual information we have from anywhere near this period, Theophilus' *De Diversis Artibus*, of the first half of the 12th century, confirms such working.⁷⁴ His application of pigments in depicting faces involves no blending of tones, so that hard transitions and firm lines result. The softer modelling we see developing in the Duecento, and

making its appearance in the Sancta Sanctorum, would be subject to later commentary by Cennini in *Il Libro dell'Arte*.⁷⁵ Some moderating of the hard linearity seen in these early to mid Duecento approaches might have led to more subtle representation of light in the handling of facial modelling, and so suggest a continuing evolution towards the more painterly results of the St. Peter's and then the Sancta Sanctorum faces. On reflection though, this does not look at all likely as a direct progression. The underlying forms and shapes of the later works are all quite different from those in SS. Quattro Coronati, or the parallel Tuscan works. They clearly followed different models. But then there is, too, a distinct difference between the St. Peter's fragments and the Sancta Sanctorum paintings. The colour and tonal handling, and also the underlying forms, of these are quite different. These fragments can hardly represent earlier works of any of the more adept of the Sancta Sanctorum workers and must be accepted as the adroit works of yet another experienced master.

S. Paolo fuori le Mura also held a source of potential examples of antique painting for artists working in Rome in the Duecento. Some mid-fifth century murals, with some later Byzantine alterations, are recorded as existing in S. Paolo fuori le Mura, and were restored or repainted by Cavallini between 1278 and 1290.⁷⁶ However, in 1823 a fire destroyed these and the only records we have now are some 17th century water-colour sketches [Pl.171].⁷⁷ These indicate matters of general style, composition and linear perspective. But, even if they show heavy indications of light and shade, as free copies of restorations they hardly help us in assessing the detailed original nature of the light and shade for faces. The later works of Cavallini from the 1290s might hint, in his modelling expertise, at some echoes of the lost murals, and it is often suggested that he learnt his modelling skills from these earlier paintings. This

is only conjecture, and any examples we have of his work all postdate the Sancta Sanctorum.

Any search for Northern influences which might have had direct effects on the Sancta Sanctorum paintings proves unfruitful. The rise of the political and cultural importance of Paris under the Capetian kings might have had some effect, and nearer home in the mid Duecento an increase in French influences could be looked for in Italy around Charles of Anjou and his court. But for the French at this period large scale ecclesiastic pictorial art was to be found in sculpture and stained glass rather than painting. The important French architectural trend, since the mid-12th century, had been towards increasing areas of glass, developed for light, decoration and pictorial potential. Little wall space was left as suitable for large scale painting.⁷⁸ Thus while the decoration of S.Francesco at Assisi brought workers south between 1235 and 1250 this was to provide stained glass.⁷⁹ These windows brought a linear treatment with them, conditioned in part by the nature of the medium, but also clearly in step with the flatter elegant stylisation of contemporary French illumination. Here faces comprise linear forms, at times elegantly calligraphic, on plain or very delicately modelled shapes. More directly, in this respect, some French manuscripts themselves were brought to Assisi. With the attachment of the future Louis IX to the Franciscan order, frequent gifts, including manuscripts, were sent to the Sacro Convento throughout the mid 13th century. One such document, The Missal of St.Louis [Pl.110] showing elegant linear stylisations, could possibly have been in use at the High Altar of the Lower Church from 1256.⁸⁰

With little to see as convincing formative models in the West, there is, in the end, only one likely source of positive influence available to guide painters towards finely modelled faces : Byzantine painting. But, in any case, many of the possible

influences already tested, themselves derive from Eastern models. The observation made earlier that the frescoed Christ in the Sancta Sanctorum is close to Byzantine *Pantocrator* forms points to this as the most likely direct source of influence. The accepted cultural superiority of Constantinople had always brought desirable Byzantine works to the West, but the turbulence of the period of the 4th crusade and then the 1204-1261 Latin Empire in Constantinople greatly increased the flow of both works and workers, as loot and exiles. It even brought about intense and extended political and ecclesiastical interchange between the East and the West. Emperor Michael Palaeologos, seeking Papal alliance to counter the Franks, even conceded Papal primacy at the Council of Lyons in 1274.⁸¹ The resulting contacts via embassies, or via less formal ones, would have brought cultural exchanges in their wake. Any likely, but yet hypothetical, pictorial contacts would have been through portable panels or manuscripts. As already noted, in works such as the Homilies of St Gregory Nazianzus [Pl.103], or the 10th century Paris Psalter [Pl.105], many Greek manuscripts had shown a continuity of sophisticated working, and through the centuries had provided examples of smoothly graded flesh tones in their illustrations. An icon of Christ in a current 12th century style, similar to that in the c.1261 Hagia Sophia *Deësis* [Pl.90] — installed on the return of Michael VIII Palaeologos to Constantinople — which reflected sophisticated facial modelling, could have been an entirely plausible model for a mid to late Duecento Italian painter seeking help for a frontal pose, with subtle, but convincing lighting effects. At the same time there were other examples in Italian Duecento mosaics of the *pantocrator* type. Paolo fuori le Mura provides one with early 13th century Byzantine connections, though its present much reworked condition does not let us judge its c.1220s effectiveness.⁸² Appropriate examples then followed through the Duecento, as in the Florentine Baptistery or later in the 1297 San

Miniato al Monte [Pl.98] apse. However, the handling of the Sancta Sanctorum *Christ*, [Pl.148] particularly in its red/green working suggests a painted rather than a mosaic model being followed. Other indications from content and style point to Eastern connections. Christ's attendant angels [Pl.147] have obvious Byzantine prototypes and again one could expect examples of these to have been available on imported panels, or painted by Greek workers in Italy. For other, more particularly mural, aspects of working any possibilities of likely direct contacts or influence are more problematic, involving either Western artists in Byzantine territory or, perhaps more likely in the context of the disturbances of the Fourth Crusade, Greek artists in the West. There is little to positively confirm either, but Vasari later wrote of a c.1250 Florentine invitation to Greek painters who subsequently taught the young Cimabue.⁸³ Certainly there are arguments that Cimabue was involved in or clearly influenced the works in the Sancta Sanctorum.⁸⁴ Indeed, in a recent appraisal, following the removal of grime and repainting which hid its Duecento nature,⁸⁵ Bellosi claimed that Cimabue's presence is obvious in the chapel, and that, though the Florentine master was not the leader in the project, he worked alongside an unnamed Master of the Sancta Sanctorum and others in a collaborative way.⁸⁶ In this Cimabue's influence, Bellosi suggests, is apparent in the way those skills and techniques, learned from his Byzantine teachers and developed as his own, were being followed in Roman painting. Of particular significance is the varied attempts to follow Cimabue's realistic chiaroscuro through softly graded variations in tone. The subtly modulated facial modelling of the *Enthroned Christ* is a case in point. This, in Bellosi's opinion, is by a young Torriti following Cimabue's example.⁸⁷ Even if this hypothetical influence is debatable, there are more positive signs of Cimabue's work in the Sancta Sanctorum. One generally accepted chain of connections in Cimabue's work concerns the



Fig.22 : Cimabue
Young Bystander, detail of
Naming of the Baptist,
mosaic, c.1270-72,
Florence, Baptistry Dome.

Fig.23 : Cimabue,
Young Bystander,
detail of *Crucifixion*,
Tones inverted to compensate
for blackening of lead white,
fresco, c.1288-90,
Assisi, S.Francesco,
Upper Church, South Transept.

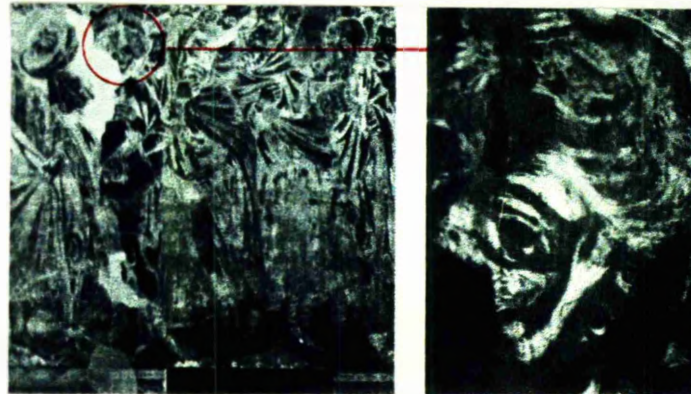


Fig. 24: Cimabue?
Soldier, detail of
Martyrdom of St.Peter,
fresco, c.1278-80,
Rome, Sancta Sanctorum.

Fig.25 : Cimabue,
St.John.
mosaic, 1301-02,
Pisa, Duomo Apse.

similarity between the young bystander in the Florence Baptistery *Naming of the Baptist* mosaic [Fig.22] and one in the *Crucifixion* in the left transept of the Upper Church at Assisi [Fig.23], and with a further possible, if less convincing, parallel drawn between these and the St.John of the Pisa Duomo mosaic [Fig.25].⁸⁸ But two figures in the Sancta Sanctorum, one in the *Martyrdom of St Peter* [Fig.24] and another in the *Martyrdom of St Paul*, can be cited as nearly identical to the Florence mosaic and Assisi examples. Even if the Cimabue-Greek connections are somewhat conjectural, it is difficult not to see parallels with contemporary Byzantine fresco works, which, though no longer available in Constantinople itself, are to be found in the North Balkans.⁸⁹ The frescoes at Sopoćani [Pl.118] demonstrate a contemporary movement in Byzantine art which was similarly turning from linear stylization to painterly gradations around the 1260s.⁹⁰

While, as suggested above, examples of the full frontal form of the *pantocrator* icon are quite likely to have provided a technical lesson in subtle modelling and a model for sophisticated representation of light and shade, this particular subject is not one which we will find depicted to any extent in late Duecento or early Trecento painting. Its hieratic nature was hardly appropriate for the more human depiction required of the time, even for devotional works. What does appear, and becomes a central element in such painting, is the three-quarter pose as seen in the depiction of Saints Peter and Paul [Pls.145 & 146]. This ubiquitous form is worth investigating in relation to light and shade and contemporary ideas on the nature of light, and I wish at this stage to suggest one possible way of considering how Duecento artists could have arrived at the patterns of shading in some of their work, or at least have justified their results with regard to current ideas on the nature of light.

A Hypothetical pattern of 13th and 14th century Facial Depiction

Besides looking for successful works of respected masters to provide models to copy, intelligent artists would seek reasons for the superiority of such paintings and look for some underlying rules to help in the execution of more than just a facsimile of the admired work. The only two technical books addressed to artists which we have, Theophilus' *De Diversis Artibus* and Cennini's, *Il Libro dell'Arte*, show that painters did look for some dependable codes of practice, as consistent supports for their work. Although there is a large gap between the two books, c.1100 to c.1400, it is clear from surviving paintings that they do respectively tell of practices in early Duecento and Trecento painting.⁹¹ A look at the products of 13th and 14th century painters with the treatises in mind, can help to confirm this and allows us to see a new set of conventions building up.

Two important factors, not obviously interrelated have, I suggest, a bearing on the early progress of the depiction of faces in the late Italian Duecento and in the consolidation of one manner of providing facial modelling. The first is the concept that lighter tones indicate prominence and darker ones recession. The second is the change in preferred pose for many representations of Holy and Divine characters in devotional works. There was a turning away from the strict frontality seen in many hieratic images as more human aspects of Christ, his Mother and followers were stressed. Humanising tendencies are apparent in the period's paintings, and influential writings of the mendicant orders readily illustrate the newer attitudes.⁹² Changes in treatment affected all the characters depicted, but the devotional images of the Virgin Mary are the most obvious examples of this new direction and, indeed, these were central to the new sympathetic presentation of religious ideas. With the move towards the stressing of the humanity of Jesus and Mary, and the concomitant rise in

importance of Mary as the ideal intermediary for intercession, there was an increase in the incidence of devotional images of her, and particularly in those where she has the role of a natural mother. The earlier frontal representations of Mary *Orans*, or of the hieratic *Nikopeia* [Pls.69 & 74] with the divine child held centrally in front of her, tended to disappear to be replaced with variants of the *Hodegetria* [Pl.119], the *Glykophilousa* or *Galaktotrophousa* forms.⁹³ Here the positions and attitudes of mother and child lend themselves to sympathetic human forms. One point of importance is the significant attitude of Mary, with her head turned and inclined, in modesty, submission or affection towards the Infant Jesus. Entirely different from the hieratic frontality which implies authority and divinity in the *Nikopeia* form, this naturally human pose became the stereotypical form for the Virgin through the Duecento and Trecento, becoming a central, and indeed, as I hope to show later, a controlling element in important areas of the Trecento's altarpiece imagery.

A slightly off-frontal presentation in portraiture was not, however, an innovation of late medieval art. The frontal depiction or profile representation of a head or figure had indicated authority or divinity in past ages. The Greeks, Romans and Egyptians all used both forms for gods and sovereign rulers. The strictly frontal arrangement featured often in statues while the profile head was consistently used on medals and coins from Hellenistic times. A more human representation in painted portraiture, when this arose, avoided the intimidating symmetry of the divine outward stare. An honest portrait still required the openness of direct address, but individuality and friendly deference was more often served by the softening of this rigidity with a slight off-centring of the head. An effective illustration of such forms of antique portrait depiction was assembled at the British Museum, in 1997, for the *Ancient Faces* exhibition.⁹⁴ Here 97 mummy portraits from the first three centuries A.D. in Roman

Egypt were on display. 80 of these have survived in sufficiently good condition to make a positive assessment of the nature of the head alignment. Of these 61 are shown with the face turned to one side [Pl.40]. Some certainly are more subtly positioned off centre, but a close look at asymmetry in cheeks, ears or the positioning of irises will confirm the orientation. Another aspect in the differences between mortal and deity is also observable in the eyes. The gaze of humans here is level, directed at the viewer, while two deities in the exhibition, Isis and Sarapis [Pl.41] here with non-frontal poses, look loftily and pointedly over the heads of the viewer. The 13th and 14th century pictures of a more human Virgin, then satisfied a long held expectation of the most suitable mortal pose.

If this inclined attitude, or three-quarter pose, as when Mary occupied herself more with the Infant than the viewer, is then approached with the “dark tones recede, lighter ones advance” rule of thumb in mind then some interesting results appear, and the near standard Madonna of the Trecento is quite predictable. The exposed or open cheek, offered to the viewer, ought conventionally to be painted a lighter tone than the distant one and the nose, as a prominent feature, is then seen as lighter still. As an example a Giudo da Siena panel [Pl.140], c.1270’s, shows a basic shading pattern emerging. Mary’s face is essentially depicted as a composite of linearly defined flat forms, head, cheeks and neck, with further linear outlining picking out the local features, eyes, mouth and nose. To the basic drawing is added a minimal amount of shading to provide a sense of differential distance between the planes. Local contrast separation pushes the tone of the far cheek down, and this is further accentuated adjacent to the nose, while the nearer cheek has only a modest touch of shading. This, even if it is based on a tacit acceptance of non directional illumination, and working purely from an understanding of the relative heights of the different planes, cannot

avoid setting an asymmetrical lighting pattern for the picture. The implication, even from this simplistic arrangement, is that the scene is lit from the side nearest the exposed cheek. This becomes still more obvious when, in subsequent developments, attempts are made, still in step with the ideas of recession through darker tones, to have features gently rounded off in offering local recessional detail. Duccio's *Crevoles Madonna* [Pl.269] can serve as a suitable example of such steps. Here the receding edges of the far cheek and the nose are toned down. With this rounding off of the nose a still heavier tonal note is needed alongside it to leave it as more brightly separated from the far side of the face. The distinct impression of a nose shadow is generated, seemingly confirming implied directional illumination from the exposed cheek's side. Thus, though no recourse to observation of nature is necessary, a broad semblance of, or approximation to, the natural lighting effects which could result from a slightly off centre illumination is generated. But it is, of course, likely that a comparison with an actual face, lit from just off-centre, would tend to confirm the arrangement as broadly conforming to nature. Then, in the spirit of "making coming before matching",⁹⁵ by using this mechanically generated lighting schema as a base, local adjustments to detail, with attention paid to nature, would be made to bring the image closer to reality and provide a localised illusion. Building on a seemingly secure "theory" the late Duecento could reach out to provide a naturalistic depiction of faces, even though the concurrence of results of observation and rule of thumb only really happened for a restricted pose and a limited lighting configuration. Though the more adventurous artists might look beyond to explore and report nature more widely, it is clear that the approach for many was to stay close to the tried and tested form, particularly for any important and revered subject. The Madonna in the great majority of Trecento devotional paintings conformed to the new standard configuration.

That such a picture of Mary could be as much dependant on rule of thumb as on observation is supported by an examination of some inconsistent detailing in the developing works of Duccio. For instance, the *Crevole Madonna* [Pl.269] and *Rucellai Madonna* [Pl.272] both show an uncomfortable twist to some of the facial features. The highlights on the bridge of the nose lips and chin do not sit easily together, nor do they fit the general modelling. Their positions show some ambivalence over an assessment of their projection from the picture plane, or face, and the reflection of light from different facets and features of the face. In the *Rucellai Madonna* the lighter tones on Mary's upper lip, chin and the lowest area of her proper left cheek are clearly reporting local heights relative to the broad datum of the head. In consequence these elements, when read in the context of the quite different modelling strategy of directional light, are apparently pulled round towards the viewer. Meanwhile, the light tones on the nose, probably offered as an indication of projection towards to the viewer/artist, rather than height from the face, tell a different story. They appear too far to the left to be consistent with the established illumination and consequently the nose is pushed decidedly to the right. These inconsistencies seemingly result from an uncertainty about the use, and local interpretation, of some rules of thumb and confusing these with attempts to follow some natural effects of incident light, and with, in addition, further confusion between sharper specular highlights and the broad tonal modelling.⁹⁶ The confusion, and equation, of specular highlights with the tonal modelling will be addressed more fully later. By the early 1300s signs of these difficulties being corrected are apparent in Duccio's work with the less contorted *Perugia Madonna* or the London *Virgin and Child with SS. Dominic and Aurea* [Pl.274]. Such confusions are largely resolved in later panels. The Siena Duomo *Maestà* [Pl.277], demonstrating increased sensitivity to the observed effects of incident

illumination, has the detailed modelling and highlights sit more comfortably and naturalistically on Mary's face, and similar detailing for all her attending saints and angels figures is convincing. A reservation is necessary here as the past attention of restoration and cleaning has centred on the important central figure of the Virgin, so that her face has lost some of its original finish. Nonetheless, there is sufficient information there to let such an estimate of Duccio's treatment be made.

This preferred manner of depiction with light appearing on one favoured side, that of the exposed cheek, proves on survey to be widespread. It was apparent on the early 13th-century mosaics in St Peter's and S Paolo fuori le Mura, and there are signs that it had been a standard of earlier centuries' portraiture. The *Ancient Faces* exhibition, (see p.158-159 above), tends to point to this. Of the 61 inclined heads already noted, no less than 52 were treated in the same way as the Duccio Madonnas, with results providing for light from the exposed side of the face. It seems likely that this traditional approach, at least in portrait work, was a venerable one producing an long established pattern of facial depiction which might have been followed from exemplar to exemplar. But its prevalence must certainly have been continually supported by its obvious correlation with the workshop rule of thumb, itself justified by the rationale of the conventional wisdom that light weakens with distance, so that more prominent items and features are seen to be brighter than ones deeper in the fictive picture space (see Chapter 1 pp.67 ff).

A standard form of Madonna in the 14th century

In whatever way it was derived or perpetuated, the entrenchment of the foregoing combination of modelling orientation and pose in painters' practice is

particularly noticeable in many of the Trecento's devotional paintings. It became almost standard for images of the Virgin throughout the 14th and on into the 15th-century. Alternatives were offered. Giotto's *Enthroned Madonna* for S.Giorgio alla Costa [Pl.213] , and then his c.1310 *Ognissanti Madonna* [Pls.214 & 215], albeit with slightly more frontal poses, offered a quite different approach where the light was clearly observed and seen to be from the direction towards which Mary had turned. This arrangement offered a cleanly modelled face with no cast or attached shadows, implied or not, to mar it. But this innovation was not followed to any serious extent, and indeed, as we shall find, was at times positively avoided. It is particularly appropriate in this respect to look at Taddeo Gaddi's *Madonna and Child* [Pl.257] for S. Francesco, Castelfiorentino. This is clearly a copy of Giotto's *Ognissanti Madonna* by one of his pupils. Nonetheless, Gaddi has adopted the standard modelling, as he did for *all* his Madonnas, with here illumination apparently coming from Mary's right rather than from the direction towards which she turns.⁹⁷ But then, even when other obvious attempts at lighting realism are being made by adventurous artists like Pietro Lorenzetti the established directional recipe was followed. His 1320 Arezzo Pieve Polyptych [Pl.315], for example, has the light carefully and realistically observed, but still falling on the exposed cheek.

The vast majority of Trecento *Madonnas* followed this way of working. D.C.Shorr's *The Christ Child in Devotional Images in Italy during the XIV Century* gives a selection of 364 Trecento examples of the Madonna and Child.⁹⁸ These are chosen with more attention paid to Jesus than to the Virgin so there could be a certain random selection in the choice of Mary's appearance. Analysing this broad "sample" of the genre bears out impressions of a bias towards the lighting configuration under discussion. Appendix II gives a detailed report of this analysis, but in summary, 80%

of the images had Mary depicted in the standard way, with head inclined and the light falling on her open cheek, while only 4.7% definitely followed the example of the *Ognissanti*, and 5% presented what were now archaic frontal poses. The remainder were indeterminate through poor preservation or reproduction.

Developments in the late Duecento

The Sancta Sanctorum frescoes, having offered us an idea of the state of Roman painting in the late 1270s, and probably representative of some of the best contemporary skills available in Italy, since the city was at that time a major centre of patronage, provide a convenient set of references to judge the manner in which Italian painting then developed. Later in the century the works of Torriti and Cavallini and their associates let us take a look at what artists chose to follow or cultivate. Despite the increasing importance of fresco working, mosaic was still the more expensive, and prestigious, pictorial medium and requires attention in any consideration of late Duecento image making. We can see in Sta. Maria in Trastevere and Sta. Maria Maggiore the respective mosaic works of Cavallini and Torriti. Torriti's *Coronation of the Virgin* [Pl.165], shows, in the faces of The Virgin and Christ [Pls.166 & 167], indications of his aspiring to the more subtle painterly effects seen in the Sancta Sanctorum Christ. But there are also signs of other aspects of the earlier mosaic techniques of S. Paolo fuori le Mura, and it is clear that there is the same conventional assumption of light incident from the open side of the face. This holds true for all the attendant secondary figures including those in the *Life of Mary* narrative panels below. Some red outlining is still used, though in such narrow strips that it is scarcely noticed at normal viewing distances. The green tesserae of the earlier practice are less evident being nearly neutral and of a much lighter tonal value, though there is a repeat there of

the hard transition between these, where they model the sides of the nose, and surrounding flesh coloured areas. Such lightening is consistent with the rest of the main modelling which is carried out subtly in a restricted range of creamy flesh colours and white highlights. Apart from a very sharp shading transition on Mary's proper right cheek, and a suggestion of a hard nose shadow on that of Jesus, a gentle graduation of tone and colour is achieved by judicious mixing of tesserae. These are not entirely casually aligned, but there are no pronounced "work lines" as was apparent in the c.1220 S.Paolo mosaics or even more so in the Sicilian mosaics. This combination of discreet control and the avoidance of linear stress-marks gives a delicate low contrast and near painterly result. But this soft approach and avoidance of any strong *chiaroscuro* in the faces is quite at variance with the treatment of the couple's robes [Pl.165]. These are offered, with decidedly heavier tonal and colour contrasts, in a stylised way displaying the fabric folds and so have areas of tone divided in a distinctly linear fashion.

Cavallini's cycle of *The Life of the Virgin*, in essence a predella to the pre-existing c.1140 apse mosaic of a *Coronation of the Virgin*, has figures of a smaller scale. With smaller scale there is more visible intrusion of relatively larger tesserae steps into modelling transitions but, even so, once more a soft tonal and colour treatment of faces applies, as might be seen in the slightly larger picture of Mary in the votive panel [Pl.172]. Cavallini, goes on, quite unlike Torriti, to demonstrate a marked, and successful, attempt to carry the broad painterly approach into the robes, as in S.Simeon's Robe in the *Presentation* [Pl.179] The volume and drape of these is convincingly suggested despite some inevitable "ragging" or "beading" where abrupt transitions from light to shade have to rely on the limits of visual mixing to integrate interspersed dark and light stones.

But if both artists restricted their tonal and colour rendering of faces in mosaic work, in their paintings we find both looking for a heightened level of contrast in faces. This is apparent in Torriti's and his workshop's Assisi frescoes in the upper registers of the nave [Pl.163]. But it seems particularly true of Cavallini if we judged from his *Last Judgement* frescoes in Sta.Cecilia in Trastevere [Pl.181]. There is here perhaps a sense of different agendas. The prestigious formal installation of the mosaics in the Sanctuary of the Churches like Sta.Maria Maggiore still brought connotations of the hieratic with reverential respect so that the elegance of serene un-tarnished features for the saintly and divine was preferable. At the same time it would appear that the same reverence for the depiction of the Virgin transfers with her into painted devotional works. Cavallini's painted Madonnas [Pl.184] all have smooth, almost bland, complexions even with dramatically modelled saints and donors in attendance. The media change seems to carry with it not just a transition in attitude to the subject matter but also a quite different appreciation of light and its effects in pictures. Nevertheless, if we look at Cavallini's mosaics we find he is anticipating these important steps. Indeed they mark and illustrate a transition in the approach to directional light as a constructive element in picture making. While he may have been inhibited by convention or habit in the matter of depicting saintly faces, and again the conventional pattern of light incident from the open side of the face is apparent in all but one or two faces no matter which way they turn, his presentation of robes and surroundings signals a new and more conscious awareness of the value of directional light and shade. A consistent asymmetrical modelling regime is imposed on every element in the mosaics apart from, as already noted, the faces. The faces are here traditional elements of pristine form set in new directional lighting contexts.

The frescoes in Sta.Cecilia in Trastevere demonstrate a move away from this blander flatter treatment, which was seemingly still expected in, or at least conditioned by, the formality of the now obsolescent mosaics. In what can only be a search for convincing mimics of real light and shade in painting, they dramatically exhibit a more obvious depth and extent of tonal excursions. It is not just that a choice is being made to follow the more emphatic modelling, shown in some of the Sancta Sanctorum models, but patently an additional factor is being sought in experimenting with the directional nature of light. In his *Last Judgement* Cavallini's arrangement offers a sense that Christ [Pl.181], and figures on the left are lit from the left while those to the right are lit from the right [Pl.182]. This does mean that some, in turning towards Christ, could be seen to follow the conventional arrangements discussed above, since they are lit on their exposed cheeks, but a goodly number gaze outwards [Pl.183] and exhibit clear signs of positively recorded directional effects. Further directional intent is unambiguously shown in the light and shade of their thrones [Pl.182]. The overall effect could have been arranged to match light from windows on each side of the church, with the fresco occupying the entire width of the inside of the east wall of Sta.Cecilia in Trastevere. The modelling Cavallini effects is broad, such as one would expect from a large window. The wider areas of lighter tones emphatically indicate those facets of features turned towards the hypothetical window. Sharply defined shadows do not arise, but his soft shading descends into noticeable darker tones in a number of cases. With less ambient light thus implied the orientation of the main illumination is underlined in the resulting *chiaroscuro* for a number of the faces. The idea of light as universally disclosing form and form being described for itself is being disregarded. The interaction of light with solid form is being observed. In the process, the common effects of an obviously shared common illuminant on adjacent figures not

only give some volume to each but also begin to suggest their sharing a space rather than a flat surface, and to tell of their relative positions in that space.

This general sense of a common lighting environment for a group of figures is quite different from most of the combinations which appeared in the Sancta Sanctorum, but on inspection we might find hints of attempts at its earlier employment. Among these frescoes the pattern of working with the suggestion of light from the exposed side of faces is the generality. There are some exceptions for minor figures, and I will return to these later, but the main exception is for Christ [Pl.148]. The treatment here is at variance with that for the other major figures who largely follow the rule of thumb construction. Christ, while near frontal in pose, has his gaze directed to his right and might be expected to be shaded as lit from the opposite direction. But the modelling reflects a sense of light incident from his proper right. His robe confirms this and the two attendant angels [Pl.147] have shading and highlights, on flesh and garments, positively following incidence from the same direction. At the same time the throne is seen as foreshortened frontally and receding to the viewer's right, and the resulting small area of exposed side is given a distinctly darker tone. This could be a token of recession, but visible planes within the throne are not similarly treated. In looking for some awakening of directional sense these arrangements could be interpreted as showing possible illumination from the window separating Christ from the two saints and the Pope. Then again they might be part of a still wider lighting compositional strategy as they integrate Him with Pope and Saints, in that He is lit from the same direction as they are. The fall of light on them could arise from a following of conventional practices. But one further detail, though not in faces, hints at a directional strategy. The votive model chapel [Pl.149] is very effectively painted, to offer a positive orientation of light from the left. A look at the

other frescoes shows that, if there are a few very localised hints of lighting consistency, no other precocious moves towards such broad directional integration are evident and indeed, as we shall see, one spectacular rejection of such coherence appears. The Christ and Papal group arrangements then might possibly be accidental and just a set of coincidences. But, even so, a visually aware painter or painters might be expected to ponder and recognise the wider pictorial benefits of the employment of such effects. One would anticipate that similar accidents must have prompted the moves to directional control of depicted light which are apparent by the closing decades of the 13th century.

Elsewhere in Sancta Sanctorum there are signs of locally observed natural lighting effects which provide small isolated areas of integration through direction. The group of women's faces [Pl.154] on the right of the *Martyrdom of St Peter* [Pl.151] is a case in point. The foremost two observe the standard rule of thumb. They are turned to their right and are lit from their left. On the other hand, the lady seen between them turns to her left, and, rather than the conventional procedure being adopted in her case, she is modelled as lit from her left too. The standard procedure was not automatically followed and a common lighting direction is observed and reported. A fourth female shown in profile to the left is rather randomly picked out in lighter tones, but, nevertheless, a small island of local directionally coherent lighting is patently generated. This is placed autonomously in a picture with other units, which also might be internally integrated, but are independent of each other in terms of lighting direction. The soldiers on the left are such a second group, and, in this case, all are lit conventionally from their right. In the same picture it is the crucified St. Peter himself who is the most striking example of this paratactic way of arbitrarily combining such units. This inconsistency has particular attention drawn to it when one

contrasts the newly cleaned and restored fresco, as illustrated in *Sancta Sanctorum* (Milan 1995) [Pl.151], and that in *Roma nel Duecento* (Turin, 1991) [Pl.152]. There is a significant difference between the modelling of the crucified St.Peter in the latter, where the 16th century intervention had clearly “corrected” the tonal pattern for St.Peter’s arms and his cross, and the restored Duecento version. Peter in the Duecento “original”, is modelled with the proper upper surfaces of his arm highlighted and the planes of his wooden cross follow suit. A sense of his illumination’s direction is seemingly reported as from the bottom of the picture. It is as if this crucifixion had been initially painted quite separately, with the artist depicting a normal, head up, execution [Pl.153]. The light in this configuration is seen to be naturally from above, and as it happens in this instance, from the direction in which St.Peter looks. All details having been completed, the whole arrangement, cross and body, was ‘turned upside-down’ and placed as an individual item in the midst of an ensemble of other units, which had been painted to observe similar shading conventions, but with their illumination accepted, as normal, from the top of the picture. The earlier, uncleaned, version, presumably with the Cinquecento over-painting, shows tonal shading on various surfaces which “corrected” and contradicted such treatment to present the inverted saint’s body and cross as more comfortably conforming to the vertical lighting orientation scheme suggested by the rest of the picture. The proper upper planes of the arms were therefore shaded off to indicate light from above and the horizontals of the cross were adjusted in a likewise manner. Only the saint’s face, it would seem, appears un-amended in the Romanini reproduction, perhaps as a result of some more recent undocumented cleaning.⁹⁹ There are other examples of such inversions in this subject. The c.1280, Sienese Dossal, *St.Peter and Stories from his Life* [Pls.142 & 143] follows similar arrangements. Nonetheless, changes in perception of such

matters were soon to appear, as we might see in an early Trecento version of the same subject, from the Giotto Stefaneschi Altarpiece. [Pl.247].¹⁰⁰ Here the crucified St.Peter is modelled with clear signs of light being from above and thus fits comfortably into the pattern of lighting for the rest of the scene.

A comparison of Duccio's *Rucellai Madonna* and his *Maestà* offer further signs of a developing awareness of interest and conscious control of directional light and its value in integrating elements into a common space. In earlier works the suggested standard resulting from the combination of pose and procedure, discussed earlier, implies a distinct direction of illumination, for the features within any one face. This presents no problems if the painting's subject is one isolated head. But when several figures are assembled into one picture, as in the *Rucellai Madonna* [Pl.270], some inconsistencies would be apparent to anyone becoming more sensitive to directional clues, and perhaps contemplating, consciously or intuitively, a shared lighting environment as a sense of common space. Here the Infant Christ and Mary turn in towards each other, and, following the conventional procedures, discussed above, Mary's light appears to be from the left and the adjacent Infant's is from the right. Then Mary's attendant angels turn in towards her and, with the standard shading recipe again applied, the sense of lighting direction follows the turn of each single head. Or again, the effects are even more obviously displayed in Cimabue's earlier *Santa Trinita Madonna* [Pl.160]. Here, while some of Mary's attendants turn inwards, others turn outwards, taking local lighting orientation to and fro with them. By the early Trecento the bi-lateral symmetry clearly enjoyed as part of a patterned composition in such works is sacrificed by Duccio to integrate his figures into a common lighting environment in the 1308-11 *Maestà* [Pl.276]. In this, the sense of left to right incidence of illumination, set it should be noticed by Mary's standard pose and

standard modelling, is carried through with complete consistency. Now the many figures to Mary's left turn inwards to her and into the light rather than away from it. This applies, too, to the Christ Child, for now his lighting is from the same side as his Mother's. The direction once set, left to right, then becomes a fixed system through the rest of the whole complex work. This applies not just to the Recto secondary narrative panels but also to all the Verso panels [Pl.296]. Note, though, that this has to be an internal matter and cannot make the scheme consistent with any existing or natural lighting since, in position on the Duomo altar, one side, the Recto, would mimic light from the south and the Verso from the north.

Other approaches in Trecento facial depiction

The late 13th-century awakening interest in directional aspects of light required that artists look for different approaches to rendering light and shade in faces. It goes without saying that the suggested conventional approach (pp. 157-161 above) guaranteeing a near naturalistic rendering for individual faces, hardly serves to satisfy every need for illusionistic working. The conventional arrangement, very obvious in some early works, like Cimabue's *Santa Trinita Madonna* [Pl.160] or Duccio's *Rucellai Madonna* [Pl.270], necessarily leaves each character with its own locally fixed uni-directional lighting scheme with light implied from the open cheek side of the face. Any intention to integrate several figures into a fictive common space through the reporting of the effects of a single directional light necessarily required an alternative approach. Even in the simplest grouping, where two figures turn in towards one another, as in the traditional Mother and Child, then one of the figures must register an alternative lighting direction. Another range of exemplars or

procedures was necessary and, or, some recourse to nature was required. The Sancta Sanctorum *Enthroned Christ* [Pl.148] shows one such suitable model with, as noted already, some signs of observation helping to provide accurate natural detailing in its tonal gradation and highlights. What might be seen as typical faces of Trecento painting can be expected to arise from this combination, of models being followed and detailing updated with resort to observation. Cennini, claiming to reflect working practice in the Trecento, calls for both the copying from the works of “buon maestri” and attention to nature.¹⁰¹ Some measure of the results of such developments might be looked for in the works of such leading painters as Giotto, Pietro Lorenzetti or Simone Martini. Arguably these provide the central examples which served to guide many painters in the Trecento. However, their selection of what natural effects they chose to report, when we look closely, is not completely free. Shared habits and inhibitions clearly gave rise to some common patterns of execution, with collective self-imposed restrictions, which then become part of the techniques of the Trecento painters. A new set of conventions was established. The recognisable characteristics of a human face are kept clearly in mind. Though some lost profiles are on occasion used adventurously for dramatic effect, this is restricted to secondary characters, and the faces of the important figures are fully presented. The light and shade arrangements consistent with this approach avoids the loss or confusion of the information in facial features. Heavy and oblique shadows are avoided and no hard lighting is allowed to cast sharply edged shadows. There is too a noticeable assumption that light comes from above, but just above, eye level,¹⁰² for in most cases the elevation of the light appears to be low enough not to present noticeable shadowing below the eyebrows, nose or chin. The resulting implied lighting arrangements generally suggest soft and relatively frontal illumination, or at least frontal to the face if it turns further into the

picture. This avoids the possibility of cast shadows from its main features, particularly the nose. The assumption of light from above, just like other generalities, is made the more obvious by finding the isolated exceptions. There are seemingly only two occasions of note in the Trecento when there are departures from normal working in this area. In S. Francesco in Assisi, above a doorway, which locally offered light to the north transept, a fresco of *Christ* [Pls.254 & 255] is dramatically under-lit. Then in the Baroncelli Chapel of Santa Croce, Taddeo Gaddi, skillfully follows the adjacent window lighting, to show one of the Virtues [Pl.263] in the adjacent ceiling vault as similarly lit from below. Yet a further assumption is that of a level of ambient illumination sufficient to ensure that an acceptable level of light will reach all parts of the face, and no sign of extreme *chiaroscuro* is permitted to intrude. Thus, while there is a decided move to recognise the directional nature of light and use it to help define space and volume in a picture, the habitual need to see light as a universal disclosing agent is still being satisfied in some measure. The compromises struck between the two concepts is in many ways illustrated in the painting of Trecento faces.

Directional consistency of fictive and existing light

Along with this evident aim to provide directionally consistent light within a picture there were also early signs of intentions to see that such directional uniformity in a mural work corresponded to the natural or normal orientation of light found in its location. The common fictive space, into which pictorial elements were to be integrated, was itself to be integrated into real space; a very obvious statement of artists' intent to pursue illusionistic working. This was a recommendation of Cennini's in *Il Libro dell'Arte*, over a century later,¹⁰³ but was already being observed at Assisi, around the close of the 13th century, in the Upper Church, *Life of St Francis*,

frescoes. The slightly earlier Old and New Testament frescoes, in the upper register of the nave walls, are more randomly handled in this respect, indicative of active consideration of the idea just starting towards the end of the 1290s.¹⁰⁴ All the *Life of St. Francis* frescoes in the three eastern pairs of bays, north and south, were given a lighting sense which followed from illumination from the east window. For example, *St. Francis Renounces his Heritage* [Pl.195], along with other bays on the north wall is lit, and very obviously so in respect of facial and flesh modelling, from the right. Further signs of conscious consideration of existing lighting are then evident in the western-most pair of bays. Those adjacent to the crossing, are painted to follow light from the western apse windows. *St. Francis giving away his Cloak* [Pl.191] on the north wall is lit from the left.

Such consistency is then famously observed in Giotto's Arena Chapel, with the light here from the west window. Having determined the side from which the light was to come in these places it is interesting to note how far the observation of its precise direction is to be reported in the different circumstances resulting from a determined programme of poses and composition. The Arena paintings, for example, have each a consistent movement or action towards the right, that is, in a clockwise direction around the chapel. Such a choice is not necessarily an arbitrary one. C.Trevarthen in discussing "spatial biases in artist's vision", in the context of the asymmetrical effects of different aspects of the two hemispheres of the brain, points to the likelihood of a psychologically inherent attention pattern in the vision of normal subjects.¹⁰⁵ A "glance curve" is found in viewers' normal attention to images, and reflected in painters' tendencies to organise the "use of space in pictures... [with] a pervasive asymmetry which carries the interest across the picture space upwards and to the right".¹⁰⁶ In looking for signs of such routine asymmetry in painting, he analyses, in

Giotto's Arena Chapel frescoes, the distribution both of the movement, physical or narrative, and of the relative positions of principle and secondary characters. The results are striking, for while the rising interest is not too apparent, they certainly confirm a decided left to right intent. In only two of the thirty six scenes, *The Baptism* and *Pentecost*, is this not the case. In fact, Trevarthen's assessment omits two episodes, *The Hiring of Judas* and *The Visitation*, but these do conform to the left-right pattern of priority and movement. Main characters in the left of the pictures move, focus their attention, or gesture, to the right while passive or responding people are found mainly on the right, looking left. Even if some of the interpretations here are debatable the overall pattern is more than convincingly left to right. The fourteen grisaille *Vices* and *Virtues* below the main sections also display a coherent directional plan, but one which shows a quite different, but evidently conscious, choice of bearing. These are, of course, single characters in each case, not narratives. The allegoric figures, with two exceptions, look towards the *Last Judgement* on the west wall; the *Virtues* addressing themselves to their left, while the *Vices* attend the other way. The odd ones out are *Justice* and *Faith* which together look out, from their central position among the *Virtues* on the south side, across the chapel to confront the *Vices*. This alternative approach to the alignment of these lower register figures serves to underline the positive following of the different clockwise plan of movement, composition and pose in the narratives above.

Whether the Trevarthen hypothesis is accepted or not, its investigation confirms the narrative episodes' internal compositional flow as being towards the west window on the south wall, and away from it on the north one. In following these narratives the various figures, whether incidental bystanders or those of importance like the Virgin or Jesus, are required at some points to turn into the simulated light and at others to turn

away from it. Here the facial modelling for each follows natural light in general direction but can be modified to accommodate changes in pose and position. Where a person is shown turned to face towards the fictive illumination, or the west window which determines it, the reported effect might suggest an angle of incidence well to the side. But if turned away from the light, in this case apparently towards the east, then the lighting angle is often seemingly portrayed as close to frontal. Any disturbing and obscuring shading across the face is thus avoided. This differential treatment is particularly true for the depiction of more revered personalities, while characters of lesser prestige like incidental bystanders can suffer more intrusive shading. *The Presentation of the Virgin* [Pls.220 & 221] shows Mary and St.Anne approaching the temple priest. The priest turned into the light is depicted as lit from nearly 90 degrees round from the normal to the picture plane, but Mary's face is clearly offered as lit, still from the left, but from only slightly away from a frontal position, thus allowing her to have clean undisturbed features. Noticeably her pose has also been adjusted to assist in this clarification, for she is not quite in full profile, even though the suggestion that she is looking at the priest, who is further into the picture, should have taken her head round beyond the profile. Beside her, St.Anne, inclined away a little further, does exhibit more oblique modelling but the resulting shading is somewhat diluted, the contrast limited and less pronounced. In comparison with both of these the bystander second from the right, who is turned only marginally more than Mary, is given much heavier modelling to follow a more oblique fall of light and has little relief to depth of tonal contrast. But here and there some major personalities are allowed to show deeper contrast and more expressive oblique modelling. In this they add drama rather than grace to the narratives and some anecdotal characterisation is clearly intended. A case in point is *Joachim's Expulsion from the Temple* [Pl.216], where the

frustrated Joachim, in turning away from the west window, catches a pronouncedly oblique light, giving broad shadows which are left deeply contrasted, being scarcely moderated by any suggestion of ambient illumination. Elsewhere Joseph is given careworn expression with similar treatment in *The Nativity* and *The Flight into Egypt* [Pl.223].

The consistent directional approach of lighting, but modified to favour some more elegant depiction of saintly or holy figures, is clearly evident, and this despite the programmed strategy reversing the compositional flow relative to light on the opposite sides of the Chapel. Only two exceptions occur where any major character in the fresco cycle has facial modelling light contradicting that from the West : an impassive Christ in *The Flagellation* and a sleeping Joseph in *The Nativity*. One might then expect such directional consistency as a feature across all Giotto workshop output. However, the Stefaneschi Altarpiece shows some inconsistencies. The St.Peter side of the double sided triptych is reasonably coherent in its left to right incidence of light. This is distinctly followed for figures in all three panels, including the prophets and angels in the associated medallions, and in the one surviving predella panel. But on the other sides of these panels, showing *The Enthroned Christ* [Pl.246], *The Martyrdom of St.Peter*, and *The Martyrdom of St Paul*, there are numerous departures from a coherent scheme. Christ is lit from our right, his left, while his attendant angels are lit variously left and right with no clear pattern, and the donor, Cardinal Stefaneschi is lit from the left. The other panels on this side of the altarpiece, including the predella, display similar variations. There is, though, some debate concerning the dating, and even the attribution, of this work. For some time it was considered to be painted between 1320-30, and a much earlier, though unlikely, date has been proposed which would have it painted before the Padua frescoes, and before the *Ognissanti Madonna*,

while other likely dates are between c.1310-1316.¹⁰⁷ Certainly, if directional control of light was part of developing sophistication of observation and technique, an early dating could explain the inconsistencies as arising through earlier lack of appreciation. At the same time, the cohesion of the effects on the St.Peter side, as compared with those on the Enthroned Christ side, might show signs of quickening interest in the visual advantages of directional consistency. In this the triptych, with its two different approaches could present a unique illustration of a move towards an new innovative technique, in the opening years of the 14th century. There is another aspect of detail which might seem to fall into place with an early dating. While the nature of light and furniture will be considered later it is worth considering, at this point, the light and shade handling of the thrones. The frontal treatment of Christ's throne in the Stefaneschi altarpiece, with straightforward and symmetrical tonal recession of the basic planes, might at first sight appear relatively simplistic, and hence earlier, if compared with the subtleties of the directional light and shade when compared with the signs of directional shading shown in that of Justice in the Arena Chapel, or the more sophisticated tonal differentiation of the receding sides of the *Ognissanti Madonna's* throne [Pl.214]. But, as becomes obvious in later investigations (see Chapter 6 pp.325 ff), the depiction of thrones becomes generally symmetrical through the Trecento and we can find later Giotto workshop paintings, like The Bologna Polyptych, post 1328, [Pl.249], which does have a symmetrically handled throne within a scheme with otherwise overall directional consistency. Alternative assessments of the quality of work involved in The Stefaneschi triptych suggest it is a workshop production with less direct control by Giotto.¹⁰⁸ This interpretation would explain the incoherent effect where the later date is accepted. By this time, following commercial success, and with a sizeable work load and a large workshop, or dispersed workshops, Giotto's control

could readily have been less direct. But, it does mean that, even if the master had had a fully developed directional technique, as in the Arena Chapel, such working was disregarded relatively easily, even when an example of lighting consistency was available within the same composite work. Other examples confirm the more random application of directional coherence in Giotto workshop projects. The frescoes in the north transept of the Lower Church at Assisi, accepted as post-Padua and around the period of the 1310-16 median dates for the Stefaneschi triptych, display a whole variety of departures with some individual experimentation evident. The *Visitation* [Pl.238], for example, shows Mary and Elizabeth lit left to right while Elizabeth's house is lit right to left. Then the *Massacre of the Innocents* [Pl.239] has its left side, with Herod and his palace balcony, together with the figures immediately below, illuminated from the right. Meanwhile, in the right hand two thirds of the picture, all the soldiers and mothers and the back ground buildings are lit from the left. There are examples of consistency, as in the *Adoration of the Magi*, but elsewhere *Jesus and the Doctors* and *The Presentation in the Temple* [Pl.241] exhibit differing patterns of incidence, though perhaps these are conditioned by the clearly adventurous experiments in the treatment of architecture, which I will examine later. Still other quite different, approaches to directional consistency occur in the *Vele* over the altar. St.Francis, in the *Apotheosis of St.Francis* [Pls.243 & 244] painted at the apex of the vault rising above the apse and thus facing out over the altar to the nave, is presented full face, here in complete hieratic frontality. He is modelled symmetrically with uncompromisingly frontal lighting, and his attendant angels are shown as illuminated from a source radiating out from his central position. The two webs on either side display near frontal lighting, but in each case this is biased towards an incidence from the central *Apotheosis*.

The notion of directional consistency continues, even if the immediate followers of Giotto seemed, here in Assisi or in his Roman workshop, to be neglecting it. In the south transept of the Lower Church, adjacent to the Giotto Workshop frescoes in the north transept and crossing, and carried out immediately after them, Pietro Lorenzetti finds it of significance and employs it throughout all the c.1317-1320 Passion Cycle he provided there on the walls and vaults.¹⁰⁹ The various frescoes are all lit left to right, and, within each one, all faces conform, at least in sense, to this arrangement. In the dark Lower Church — there is little natural light from the small apse windows — and with the work extending up on each side, to meet, and become effectively ceiling painting, in the centre of the vaults, the choice of any directional sense would have been problematic. If we wish to see it related to any idea of existing lighting, this was presumably to be available from the nave and crossing, and the largest section, a *Crucifixion* [Pl.312], directly adjacent to these might be seen to accept the incidence of light from its left. This follows reasonably enough for the east wall and vaults, but with the turn along the south wall and round onto the west one and its vaults, the left to right orientation within each scene is maintained and not reversed, as illustrated in [Pls.302 & 303]. Direction here like Duccio's *Maestà* accepts a left to right consistency. A directional technique is also repeated by Simone Martini in the adjacent St. Martin Chapel, but there, with a large window to the south, the direction follows the natural illumination, right to left on the east wall [Pl.342], and from the left on the west. However, it must be noted that, while the general directional sense of facial modelling is consistent, left to right, or right to left, to be in step with the existing natural light in the St.Martin Chapel, or with the common directional orientation chosen by Pietro Lorenzetti, in both groups of paintings modifications are again found to accommodate those characters who turn away from the notional

direction through the requirements of composition and narrative content. Just as for the *Presentation of the Virgin* in the Arena (see pp.177-178 above), or as we might see in Duccio's *Maestà*, adjustments of pose, local lighting angles or sufficient dilution of shadows all prevent any excessive shading interfering with the recognisable forms or decorous appearance of the faces of important characters. In particular the assumption of a high level of ambient light is particularly apparent in the smooth elegant complexions of Simone Martini's faces.

The directional strategies, including those tactical modifications already observed, which allow for selective use of modelling and contrast, can be seen fully evolved in Ambrogio Lorenzetti's, 1342, *Presentation in the Temple* [Pls.334 & 335]. The illumination is established as left to right and again the flow of interest is in the same direction; from Mary towards Simeon and the Infant. There are, though, differences in the light affecting each of the figures involved, and a closer look shows the adjustments selectively used or avoided. Joseph is turned from the light and here the accidents of shading and some highlights are accepted, but with some dilution from ambient light to moderate contrast a little. The prophetess Anna faces the other way, into the light, but to offer interesting characterisation, pointing up her careworn years, through pronounced modelling and highlights the light for her is pushed far round, effectively into the picture space. The specular highlights on her face and on Joseph's indicate the degree of adjustment. Anna's sits well round the bridge of her nose, and suggests an angle, of around 90 degrees with respect to the normal to the picture plane, in other words parallel with this plane. From this direction Joseph would have had no direct illumination on his face, it would all be intercepted by the back of his head, but clearly the shine on his face tells a different story. Broad lustre on his right cheek and a sharp reflection down the side of his nose point to a source which would find itself at

approximately 45 degrees to the picture plane, and thus is similar to that lighting the foreground pillars. For Mary, also turning from the light, her local direction of illumination appears to be much nearer the normal to the picture plane, but in addition there are other ameliorating factors. She has softer modelling speaking of a broader source of light than either Anna or Joseph, and her lack of noticeable highlights is consistent with this, even though the maid at her right shoulder does exhibit some shine. Additionally even the small areas shadows or shading that might have been generated by this angle of light, to give some measure of contrast, are filled out by an implied ambient illumination not available to Anna or Joseph. The priest and Simeon are treated as worthy of characterisation, just as Joseph was, accepting the oblique and harder lighting with less moderation of contrast. The other attendant figures broadly follow suit. There is, though, one other figure subject to a quite separate individual treatment. The Infant [Pl.336], to accommodate his particular position, lying horizontal in Simeon's arms, is lit, still nominally from the left, but from an angle high within the fictive picture space. The arrangement offers an effective modelling for the child while bringing a special lighting emphasis to bear on him. But the arrangement could well have had some iconographic purpose behind it, for the illumination, perhaps consciously organised, could be seen to come from the medallion in the arch above the priest, with its prefiguration of a divine Christ offering a benediction to his human infant self. An indication of the self-sufficiency of the Deity is perhaps intended.

Developments in the use of specular highlights in the depiction of faces

The significant part played by specular highlights on faces was noted in the above discussion of the Ambrogio Lorenzetti *Presentation in the Temple*, and the

development of their use is an essential part of the evolution of late 13th and early 14th century painting. Before looking at such developments it would be better to repeat the distinctions between the two forms of reflection, “diffuse” and “specular” (see Chapter 1 pp.53-54). The latter with its precise mirror-like nature for a shiny object, is quite different from the broad diffuse reflection observed from matt surfaces. It produces sharply defined, and precisely located, bright highlights, and these are dependent only on the relative angle of the incident light and that of any polished facet it touches and are not indicative of the general rise and fall of contours on a matt reflecting surface. The two types of highlights were clearly confused in some earlier Italian Duecento works,¹¹⁰ and this, combined with the “light tones advance” schema, as we have seen contributed to the difficulties apparent in the Duccio *Crevole* and *Rucellai Madonnas* (discussed above pp.161-2). Once disentangled to work independently of general modelling the specular highlight was a potent device. As a tool to indicate texture, and as an added clue to local changes in the contours of polished or suitably lustrous surfaces, such as skin, it could be exploited to enhance illusion. The exploration of its effects as they affect the depiction faces was a noticeable pursuit in the late Duecento. Though specular highlights appeared with different measures of precision and confidence in earlier painting, works in Assisi in the late 13th century demonstrate a wholesale experimentation and testing of their utility in the illusionistic treatment of faces. There is a range of late Duecento examples of this enthusiastic pursuit in the Upper Church of S.Francesco, and a subsequent selective, and generally more restrained, Trecento usage can be followed in the Lower Church.

The distressed state of the transept and crossing frescoes make any assessment there impractical, but elsewhere there is a wide variety of degrees of balance between specular lights and broad tonal and colour shading throughout the Upper Church nave.

Differences are apparent in the upper registers between, for example, the Isaac Master's sharply applied and very insistent highlights [Pl.187] and the more restrained softer ones in the Torriti *Creation of the World* [Pl.163]. But there is a real miscellany of approaches in the lower *Life of St. Francis* cycle. The multiplicity of workers is evident in this variety. The St.Cecilia Master's *St.Francis and the Madman* and *The Liberation of Peter the Heretic* offer [Pl.212] bright soft modelling in light tones with reflected lights similarly softened, or lost in blending with these. Elsewhere glinting lights of varying levels of sharpness, weight and size sit on an assorted range of complexions. Some are modelled fully in a range of flesh colour values with the highlighting added lightly but positively, while others as in the dramatic *Ecstasy of St.Francis* [Pl.203], have a limited dark range of flesh colours and the strong white highlights consequently provide much of the modelling. Other strikingly effective instances are, the Sultan's Magicians in *The Ordeal by Fire*, [Pl.202] with soft but convincing highlights articulating their strongly modelled ruddy complexions, or a number of background faces in *The Verification of The Stigmata* [Pl.210] with some exquisitely controlled tones and discrete highlights.

Noticeably all the many robust exercises involve mature male faces. The faces of women, and the young Francis, enjoy a smoother treatment with broad highlighting blending easily into softly contrasted flesh tones. Such subtle effects are also used most expertly for the nude body of the youthful Francis in *Francis' Renunciation of his Father's Inheritance* [Pl.196]. There are here indications in this experimentation that the earlier situation where specular reflection was, in a sense, annexed to be seen as an adjunct of tonal modelling is in some ways reversed. Now with a better understanding of shine and glint there are signs that the broad highlights are to be seen as extensive lustrous reflecting facets reporting the light and the vivacity of live form

rather than the prosaic undulations of surface on an inanimate object. Located to follow faceted parts of the faces as sheen, rather than spot effects for emphasis, they can, when necessary, take over from simple tonal gradations as the main modelling agent, even sharper highlights being still available if additionally required to precisely point up direction. In short, Assisi shows that by the end of the 13th century the specular highlight, and its softer manifestations as sheen and lustre, was fully appreciated and was now an effective weapon in the painter's armoury.

In spite of the multiplicity of essays in shading and shine one factor can be consistently observed. The directional nature of glint, or sheen, and shading is shown to be valued. With only one or two exceptions the general sense, left to right or vice versa, and sometimes a precise angle, of illumination is reported consistently throughout a picture.

The Assisi Upper Church nave would seem to represent, in this matter of the employment of highlights and the pursuit of lighting direction, as it did for other aspects of painting, a centre for experiment, interaction and exchange of ideas. Indeed the paintings of the Upper Church "demonstrate in microcosm, much of the change in Italian art during this crucial period of transition."¹¹¹ The different approaches in the earlier upper register painting and first sections of the lower frescoes were obviously tried, intermixed, developed and tested by the many workers involved in the upper and lower frescoes. While it is difficult to judge from the poor state of repair of the upper works it would seem the widest interaction and most vibrant technical discussion took place in the later lower *Life of St Francis* paintings. Thus while the Upper Church nave was a prestigious showcase for the best mural art of the late 13th century it was also a training ground and source of examples for younger artists whose selection, modification and cultivation of the techniques can be followed

through into the Trecento. The works of Giotto, whether he was a leader or junior in this immensely influential project or not, illustrate the lessons drawn from and the beneficial effects of such experimentation and interactive learning. A few years later in the Arena Chapel, the enthusiasms of experimentation now in the past, the evidence of conscious control and balance is clear. The various elements, soft and sharp highlights and broad modelling in varied ranges of tone, are now used as sophisticated tools complementing each other's worth, and the highlights, relinquishing any demonstrative experimental role, draw less attention to themselves. The highlights of sheen and shine then are evident, but not intrusive in general depiction of features. Not over played, but retained for appropriate use, their value as dramatic and exaggerated accents is enhanced and they are available for selective expression of emotion or characterisation. For instance, the serenity of Christ is generally preserved throughout the Scrovegni Chapel with modest touches of highlighting, but noticeably one case where a sharp narrow reflection appears on his features is in the *Road to Calvary* [Pl.233], a token of distress in an emotive scene. Or again, the careful detailed depiction of Pilate [Pl.232], relies on a spread of extensive lustrous highlights to aid characterisation and visual communication.

An established preference for a restrained but selective mix of tonal modelling and specular highlighting might be followed back to Assisi. The Giotto workshop frescoes in the Lower Church transept offer gentle facial modelling, reserving any distinctly polished accents for the emotional emphasis of anguished expressions in the *Crucifixion* or on the faces of the mothers in the *Massacre of the Innocents* [Pl.240]. The slightly later murals, by Pietro Lorenzetti, in the south transept continue the controlled approach.¹¹² But there was still within these evidently accepted limits some room for manoeuvre. With the subject matter concentrating on the more emotionally

charged end of Christ's life, from the *Entry to Jerusalem* [Pl.305] through to the *Resurrection*, the need for strong expression involved more highlight accents and some stronger facial contrast, though still not reaching anything approaching a deep *chiaroscuro*. At the same time this can be seen to suit Pietro's evident interest in lighting effects and obvious enjoyment in the recording of individual characterisation and the everyday. On the other hand, a further significant, and influential example, of the restrained manner appeared in the Lower Church with Simone Martini's refined faces for the St. Martin Chapel [Pl.342]. He tended to use sharp specular highlights rather sparingly. But their particular use is very selective and quite telling. Apart from his frescoes his devotional panels and polyptychs display little or no shine, a fine sheen at most. A delicate blending of broad rather than sharp highlights into complexions of low colour and tonal contrast provide for this. The reverential nature of the formal mosaics, like those of Torriti's Sta.Maria Maggiore [Pls.166 & 167] is recalled. Simone's general reflection of a traditional deference, in limited colour, tone and contrast, provides for a courtly elegance in keeping with his often noble patronage. Early models for the polished dignity of the International Gothic are being set here. This sense of decorous gentle colouring and curtailed contrast is found in his frescoes. The St.Martin Chapel offers suitably restrained modelling for his main personalities. Noticeably these saints, bishops, courtiers and emperor, are also free of shine. But when some dramatic atmosphere is required, as for *The Burial of St Martin* [Pls.346 & 347], sharp highlights are to be found on lesser mortals, like the attendant acolytes and friars.

Similar differentiation is noticeable elsewhere; emotional expression often relies on more pronounced use of highlights. For the main characters in larger devotional paintings, with saintly serenity wanted, brightly shining features were not appropriate,

but their appearance in narratives brought a change in status, and signs of more human disturbance could be accepted on their features. The differences between the two approaches, smooth devotional and more emphatically enlivened narrative, are apparent between the Recto and Verso of Duccio's *Maestà*. Elegant and restrained countenances [Pl.278 & 279] with no more than a soft glow populate the first, while the sharper insistence of glinting lights enliven many of the features in the latter [Pl.286]

One particular aspect of specular reflection, which is universally absent in all Duecento and Trecento paintings, is the sparkling shine in eyes. This however warrants separate attention and will be discussed in Chapter 4.

An apparent directional precedence given to central characters, particularly the Virgin, in Trecento altarpieces.

The standard approach to the portrayal of the Virgin Mary, discussed earlier, affected more than just her own local image in a great number of devotional paintings. While there was an increasing use of narrative within altarpieces in the mid-Trecento — Ambrogio Lorenzetti's *Presentation*, Simone Martini's *Annunciation*, and Pietro Lorenzetti's, *Nativity of the Virgin*, are all examples — a substantial number had the Virgin and Child at their centre. In these, where attempts were made to show consistent directional lighting across paintings, Mary's central position in many altarpieces, with a close to obligatory lighting pattern, is seen to dictate the orientation for illumination on other elements and attendant characters. Duccio's *Maestà* [Pl.276] is the most obvious example of this. With its large number of saints and angels attending the enthroned Virgin it presents a rich and extended composition. Duccio endeavoured to integrate these into the one common picture space by having a

consistent directional lighting environment. In this the enthroned Virgin, facing to her left, in a central privileged position and with the accepted portrait lighting treatment, sets the pattern of lighting. The light comes from the left. Her ornate throne conforms to this and all attendant characters, including the Infant Christ, accept the general directional sense of this illumination. Those figures to her right, in turning into her, are modelled in the same manner as she is, while those on her left, in addressing her, turn into the light. A ready comparison can be made between two similar figures from each side, Saints Catherine and Agnes [Pls.278 & 279].

It might have been expected that Jesus should have been treated to the same preferred modelling as Mary, but as D.C. Shorr points out the image being generated in these paintings is Mary as the Majestic Mother of God, and for the Trecento the Infant is to be seen in a more human guise.¹¹³ In many late Duecento Mother and Child images, the direction of His modelling followed the conventional pattern with the nearer, exposed, cheek seen to be the brightest. So in the normal arrangement, with Mary on the left and Jesus on the right, he is lit from the right and she from the left. But by the early Trecento, with the noticeable trend towards offering coherent lighting direction in most works, this pattern changes. Then the depiction of the Virgin takes precedence and Jesus' lighting becomes dependant on that of his Mother. The works of Cimabue, Coppo di Marcovaldo or Guido da Siena [Pl.140] can show the earlier situation, and Giotto's *Ognissanti Madonna* [Pl.214] or Duccio's *Maestà* [Pl.277] the new approach.

Further examples displaying a clearly considered pursuit of lighting consistency, centring on Mary, are to be found in the works of the Lorenzetti. Pietro's, 1340, *Madonna and Child Enthroned with Angels* [Pl.317] has all its characters carefully lit in concert, and the overall consistency of lighting from the left is underlined by the

firm modelling of the throne. Ambrogio's c.1335 *Massa Marittima Maestà* [Pl.321] shows similar care in directional coherence for each of a whole throng of saints and angels in as congested a heavenly court as the Duccio *Maestà*. His c.1340 little *Maestà* [Pl.333] is similarly consistent, with all figures again lit from the left. But here there are signs of local modifications, just as in his *Presentation in the Temple*, to allow for effective characterisation. The Popes and Bishops all have noticeable contrast, approaching *chiaroscuro*, and of these, the two on the right, though still lit from the left, have their illumination apparently arriving from a source well round to the left, while conversely the two on the left have their lighting modified to be a touch more frontal.

While many examples can be cited where this continuity of direction seems to flow out from the Virgin, there is one important early Trecento *Maestà* type painting where this is not so. But in its inconsistencies it serves to draw attention to the more general rule. This is the intriguing Palazzo Pubblico *Maestà* [Pl.338] by Simone Martini. Here there is a right to left incidence of light for all members of the assembled heavenly court. This direction suits its position on the east wall of the Sala del Mappamondo with the natural light coming from the windows on the south side. However, Mary and the Infant [Pl.339] are not treated in the same way. The Child is posed and lit quite frontally, while Mary, in a normal three quarter pose, is part turned to her left, towards, not just the Infant, but also towards the windows on the south wall. She is, nevertheless, not shown as lit from this direction, though this would have had her consistent with the assembled saints. She is lit from her right.

Conventions of preferred portraiture working and preferred pose would seem have been given priority here, as reverentially appropriate for the Crowned Virgin, and chosen despite the clear appreciation everywhere else in the work of the direction

of natural light. In casting around for some reason for this difference, the choice of pose might be considered as a possible contributing factor. In Trecento painting the Mother and Child duet tends to be offered much more often with Mary on the left, and turning to her left, where she holds the Infant. Again D. C. Shorr's selection in *The Christ Child in Devotional Images*, could provide some illustration of this. Here the ratio of the Virgin turned to her left, rather than to her right, is nearly 4:1.¹¹⁴ This more favoured polarisation was evidently selected by Simone, and combined with a conventional approach to local facial modelling produced the apparent lighting inconsistency

The foregoing illustrations are all unitary panels with the Virgin and Child and attendant angels and saints sharing the same pictorial space. Any aspirations to providing some illusion of their common location in a realistic environment would readily look for their sharing coherent lighting. Some consistency in the directional nature of modelling reasonably follows. A different arrangement, which might not have been as conducive, or indeed felt requiring of such integration, arose with the segmented polyptych which became a popular type of altarpiece from around the beginning of the 14th century. Here the various saints and angels, are dispersed among the distinctly sectionalised sub-panels and gabled pinnacles, which comprised these often complex architectonic structures. Each discrete representation could have been treated as a separate picture with its own local directional rationale and some certainly continue to be used in this way for different reasons, tradition, pattern and aesthetic, throughout the Trecento. But, particularly in the first half of the century, there are clear signs of a conscious pursuit of lighting coherence with consistent lighting direction being followed across the many divisions of polyptychs. Where this path is taken, and the central panel is a Mother and Child, the lighting direction is invariably

that set by the treatment of the Virgin. The c.1305 Siena Pinacoteca Polyptych no.28 [Pl.275], by Duccio, shows lighting from the left for all characters, Mary, Christ Child, saints, angels and even for a presiding, frontally posed, Christ in Benediction. Giotto's 1330's Bologna Polyptych [Pl.249] has the light reported from the same direction for each figure across the complete assembly. Similarly Simone Martini in his c.1319/1320 altarpiece for Sta.Caterina in Pisa [Pl.348], has no less than 44 figures, in four vertical registers, with every one lit from the left. In this case, quite unlike his 1315 *Maestà*, the Mother and Child conform to the general pattern.

Coronation of the Virgin

The foregoing paintings, with Mother and Child, place the Virgin at the thematic and physical centre of these works and let her treatment dictate any directional programme which might be followed. There are other paintings, besides narrative panels, where she occupies a secondary role and so does not dominate the lighting scheme. In one important group of pictures the Virgin is required to share central importance with Christ. These are the numerous pictures of the *Coronation of the Virgin*. This theme portrayed as we have seen in mosaic in Sta. Maria Maggiore [Pl.165] in the late 1200's becomes a regular subject through the mid to late Trecento and on into the Quattrocento. A good number of these accepted the conventional light and shade approach for both central figures and expanded the resulting divergence into a pattern of bilateral symmetry. Giotto's altarpiece for the Baroncelli Chapel [Pl.250] is an early example and two later but very appropriate ones are Jacopo di Cione's 1370-83 San Pier Maggiore Altarpiece [Pl.353] and Agnolo Gaddi's 1380 version [Pl.391] both in the London National Gallery.

A central compositional arrangement is standard in all of these. Mary is placed on Christ's right hand, the position of honour, sitting on the left of a common throne with Jesus on the right. Both are turned inwards to each other, she bows forward to receive the crown, and he reaches to place it on her head. Both are lit conventionally from their exposed sides, Jesus from the right of the picture and Mary from the left. The pattern then set and followed is symmetrical with a very precise division down the centre of the picture. All figures on the right side of the panel, and in the adjacent right hand panel in the case of the San Pier Altarpiece [Pl.354], follow Christ and are lit from the right, while those on Mary's side are lit, like her, from the left. The throne is modelled symmetrically. The pattern is broken in only one place, and here a dilemma, a problem of compatibility, is made apparent. The hand of Christ is modelled, in these two examples, from the left, as for Mary's domain, not as for Christ's. A transition is seen, and is particularly noticeable in the Gaddi version [Pl.391] where the modelling at the wrist abruptly changes and Christ's sleeve is modelled consistent with Him and His side of the composition. Otherwise the obvious plan of two separate but mirrored spheres of lighting directional consistency is intact. Agnolo Gaddi found a smoother accommodation in his later Washington *Coronation of the Virgin* [Pl.392] by having Christ's sleeve more frontally modelled to offer a less intrusive transition between Christ's face and hands, and Jacopo di Cione's Zecca *Coronation* [Pl.351] has Christ's hands and arm modelled as from a frontal source, neither left or right.

Of course the problem of Christ's hand does not arise where the artist does not seek to suggest some divine pattern, and, more realistically, has both Virgin and Christ illuminated in the one common light. Examples of such a naturalistic approach do appear in the mid to late 14th century. A goodly number occur, for example, away

from the more pattern conscious atmosphere of late Trecento Tuscany, in the more pragmatically practical climate of Bolognese painting. Simone dei Crocefissi or Vitale da Bologna [Pl.388], for instance, both depict *Coronations* with coherent lighting direction. Nevertheless, it is apparent that here, again, the direction follows from that determined by the standard depiction of the Virgin Mary.

Later Trecento Faces

This search for progression in the creation of successful illusions of faces through the use of light and shade has of necessity concentrated on the later years of the 13th century and the opening ones of the 14th. The latter half of the Trecento offered little by way of innovation. Following the advances made in the late Duecento and the early Trecento a measure of consensus seems to have been reached on a satisfactory level of local illusion for faces by the second decade of the Trecento. Some consolidation then occurs with the refinement of techniques but little further basic development takes place until the Quattrocento when Masaccio begins, as in *The Tribute Money* [Pl.407] to impose more dramatic and aggressive shadows on his faces. Perhaps a token of the uncritical acceptance is to be noted in the rejection of the modelling for the *Ognissanti Madonna*, and the near universal continuity of the standard form of Madonna being retained as an appropriately decorous symbol in devotional art. While the picturing of faces in narratives was allowed some more liberal approach, even here the accepted constraints on pose, contrast and shadowing, to provide recognition and reverence, kept the results, at least for main characters within tacitly agreed limits. Some masters like the Lorenzetti and Simone Martini polished up the standard forms to offer some realism or elegance within the limits of what were effectively new conventions. However, any promise there might have been of further adventures to follow such consolidation died with them.

The basic established modelling techniques were not rejected, but the achievement of overall illusion was patently not a high priority, and the religious message together with its seemingly presentation as a picture rather than a prosaic piece of realistic reporting would appeared to have been more important. The various versions of *The Coronation of The Virgin* are perhaps indicative of this trend. In these the different figures are presented, each with local naturalistic treatments generated in the conventional way. They are, though, organised into arrangements of pictorial and decorous significance rather than any mundane reproduction of actuality. The balance had shifted to picture rather illusion.

In such circumstances the treatment of faces generally followed earlier models quite routinely and at the end of the century, for example, the faces of Agnolo Gaddi, or Spinello Aretino [Pl.394], can offer the same general forms we saw earlier. This is more obvious in groups where the mechanically repetitive appearance of many figures, particularly in their faces, provides an aggregate of duplicates rather than an animated crowd of individuals. The Jacopo di Cione San Pier Altarpiece [Pl.354] is an example of this. There is clearly a programmed resemblance between many of the faces. Appropriate suggestions of light and shade are made but they are mechanically turned out and finished, each in a standardised way. The ideas of light and shade have become ossified and, though observed, are carried out to formulae, or by copying.

Exceptions occurred to offer evidence of some renewed direct appreciation of the natural effects of light on faces. In the pursuit of a sense of convincing reality Tomaso da Modena, when depicting forty luminaries of the Dominican order for the 1351-52 decoration of the Capitolo in S. Nicolò, Treviso, was at pains to provide a sense of individuality for each figure [Pl.384]. While, of course, portraiture of the particular friars was not intended nor possible : many of the subjects being long dead or in distant

locations,¹¹⁵ it is clear that each character is based on a surrogate portrait. To get the vivid characterisation required the paintings must have been painted from life. In consequence, the self evident close attention to detail accurately reports the minutiae of lighting effects in each case. Indeed, this individualising accuracy is all the more evident as the figures all have identical generalised contexts of “mass produced” desks and cells.

A little later, but still in the North East, a similar close attention to natural detail by Altichiero is evident. Many of his characters are given an individual living presence only possible through working from life. A number of Paduan characters populate his frescoes in the Cappella di S.Giacomo of Il Santo and the adjacent Oratorio di S.Giorgio [Pls.363-368]. Besides this it is clear that particular portraits of the Lupi family and associates are a feature of Altichiero’s work here.¹¹⁶ Again the subtleties of light and shade playing on the faces are accurately followed as result of such working. An interesting comparison might be made between the animated crowds of Altichiero’s frescoes and the aggregates of painted clones in his contemporary Giusto’s work in the Padua Duomo Baptistery [Pls.378 & 379].

For all the care and attention paid to natural detail as opposed to slavishly following set forms, both Tomaso and Altichiero stay within limits accepted early in the century. The assumption of near frontal lighting, of quite low elevation, guarantees the illumination and disclosure of all facial features. Then a fair measure of ambient light is implied so that what modest shadows could be produced are hardly allowed to darken towards deep *chiaroscuro*. This is particularly noticeable in Tomaso’s work though Altichiero does reach a little towards some heavier modulation of face tones. But serious attempts to take the reporting of faces beyond these restrictions do not appear until the second decade of the Quattrocento with Masaccio.

Chapter 3 Notes

- 1: Gardner in *Sancta Sanctorum*, presentazione di C.Pietrangeli, introduzione di A.M.Romanini. Saggi di J.Gardner, S.Romano, M.Andaloro, A.Tomei, P.Tosini, G.Colalucci. Relazioni di B.Zanardi, N.Gabrielli e altri, Milan, 1996, p.29, considers "Il Sancta Sanctorum è il primo spazio architettonico a noi noto che, a Roma, sia stato costruito con l'intento di decorarlo ad affresco, e questa intenzione spiega probabilmente la netta riduzione della dimensione delle finestre."
- 2: J.White, "Recensioni: Sancta Sanctorum", *Storia Dell'Arte*, 88, 1996, p.372.
- 3: Romano in *Sancta Sanctorum*, *op.cit.*, p.95.
- 4: Pantocrator, or 'Ruler of All' was normally shown on central domes or the semi-domes of apses. Normally Christ, as God, is shown half length in Byzantine Churches, but full length versions occur, for example in the "Martorana" in Palermo, and in other western versions : S.Marco Venice, Florence Baptistry or S. Miniato al Monte.
- 5: The Italian title *L'Acheropita*, follows from the Greek *acheiropoietos*, *ἄχειροποίητος*, "made without hands" implying divine manufacture, but in the justification of icons in the Greek Orthodox Church the real meaning was taken to be that of the Incarnate Word. See L.Ouspensky & V.Lossky, *The Meaning of Icons*, trans.G.E.H.Palmer & E.Kadloubovsky, New York, 1989. p.69, with the New Testament effectively rescinding mosaic law the true *acheiropoietos*, Christ, was in fact the image to be copied by iconographers.
- 6: Romano, in *Sancta Sanctorum*, *op.cit.*, p. 58.
- 7: H.K Mann, *The Lives of the Popes in the Middle Ages, Vol. I (in Two Parts), Part II. 657-795*, 2nd edition, London, 1925, p.293-4. In the autumn of 752 A.D. with the Lombard king Aistulf threatening Rome and its citizens Pope Stephen II or III (the nominal Papal sequence was left uncertain with the early death of Stephen II before his consecration as Bishop, and the immediate election of another Stephen to the Papacy) "called the people together, and exhorted them to implore God's pardon for their sins, assuring them that He would yet free them from the hands of their foes. Accordingly a great procession was formed to go to the Church of St Mary Major. Litanies were chanted and images of Our Lady and Our Lord were carried by the priests. The Pope himself, walking with bare feet, bore on his shoulders a famous picture of Our Lord, thought to have been miraculously painted..." and, *ibid.* p.294. note 3, reports the painting was "Still preserved in the Sancta Sanctorum oratory of the Lateran."
- 8: Zanardi in *Sancta Sanctorum*, *op.cit.*, p.236, in his report on the conservation of the frescoes.
- 9: Romano in *Sancta Sanctorum*, *op.cit.*, p.94, referring to the St.Agnes Martyrdom writes, "In quest'ultima scene l'utilizzazione di un patchwork di maniere è estremamente insistita, e incide sull'omogeneità e anche sulla qualità dell'insieme."
- 10: *Ibid.* pp.101-102. "uno sforzo sincretico che ammette la convergenza di maniere svariate e gli affreschi ... in parte lo dimostrano."
- 11: *Ibid.* p.52, states "Non dire stupire, mi sembra, il fatto che i pittori di più alta qualità si concentrano nella parete dell'altare che ospita le scene più significante." And in p.56, suggests it to be the work of "il capo bottega, comunque il pittore più raffinato."

- 12 Bellosi, *op.cit.*(*Cimabue*), pp.84-85. His suggestion is based on similarities between the face of the Sancta Sanctorum Christ and more solidly attributed Torriti works like *The Creator* in Assisi [pl.161], but noticeably the throne is quite unlike any Torriti versions.
- 13: Zanardi in *Sancta Sanctorum*, *op.cit.*, p.236.
- 14: Cennini (Tempesti), *op.cit.*, pp.70-71, Cennini uses the term for flesh colouring, a pink, in fresco work, comprising “d’un poco di bianco sangiovanni (lime white), e un poco di cinabrese chiara (sinoper)” while for tempera work p.116 cinabro (vermillion) takes the place of cinabrese.
- 15: Cennini (Thompson) *op.cit.*, pp.45-47 covers the process in fresco, while pp. 93-94 covers that for tempera.
- 16: Romano in *Sancta Sanctorum*, *op.cit.*, p.57, “si tratto di un momento di individualizzazione assolutamente inedite ... forse qualche brano di scultura raggiunge in grado di novità analogo . . . Ma non mi viene alla memoria un altro caso pittorico precendent o contemporaneo, che in Italia centrale, gli stia a pari.”
- 17: Zanardi, *ibid.*, p.236, notes “... lo pennellate individuano solo le zone in ombra e sono stese tono su tono, su un unico color carni di fondo. In questo modo sono eseguite le teste dei S. Lorenzo Pietro e Paolo (nelle scene dei loro martiri) e il vecchio padre che parla con S. Nicola nella scena del miracolo del santo.”
- 18: A.Tomei, *Jacobus Torriti Pictor: Una vicenda figurativa del tardo Duecento romano*, Rome, 1990, p.48, reports the various dispensations and in particular quotes Nicholas IV’s 1288 Bull. Offerings were to be used at the friars’ discretion in order to “facere conservari, reparari, aedificari, emendari, ampliari, aptari, et ornari Ecclesias Sancti Francisci de Assisio et Sanctae Mariae de Portiuncola”.
- 19: Okey, T., ed.& trans., *The Little Flowers of St. Francis, The Mirror of Perfection by Leo of Assisi*,(trans. R.Steele), *The Life of St Francis by St Bonaventura*,(trans. E.G.Salter), London, 1910, p.384. St.Bonaventura’s version is “there appeared betwixt the wings the Figure of a Man crucified, having his hands and feet stretched forth in the shape of a Cross, and fastened unto a Cross.”
- 20: Lunghi, *op.cit.*, p.23.
- 21: E.Sindona, *L’Opera Completa di Cimabue : e Il Momento Figurativo Pregiottesco*, Milan, 1975, p.93, in considering the chronology of painting in the Upper Church cites a report by Venturoli (*Storia dell’Arte*, 1969) that, according to the *Constitutiones* of the 1279 Chapter General held at Assisi, there was no decoration in the Upper Church.
- 22: Tomei, *op.cit.*, p.49 and Bellosi, *op.cit.*(*Cimabue*), pp.84 & 279.
- 23: Sindona, *op.cit.*, pp.90-95.
- 24: *Ibid.*, p.90, cites Wickhoff’s 1889 proposition and at the same time points to the fact that this would have excluded Cimabue, born c.1240.
- 25: *Ibid.*, p.93.
- 26: E.Battisti, *Cimabue*, New York, 1967.
- 27: White, *op.cit.* (*Art and Architecture*), following an extensive examination, pp.178-198, suggests on p.197, a “tentative and inevitably controversial chronology of Cimabue’s career” and “His work at Assisi, with its many reflections of the new developments in Rome and possibly even of Cavallini’s early work in S. Paolo, comes at the close of the seventies or in the early eighties.” He annotates the associated illustrations with an ambivalent “c.1280(?)” having, *ibid.*, p.191, discussed the uncertainty of dating the Assisi transepts and vaults in following the scant evidence of documented funding, or from inferring a necessary direct

coincidence between the *Italia* vault's depiction of Roman buildings, with its Orsini *stemmi*, and the papacy of Nicholas III (1277-80) and the offer of the senatorship to him.

- 28: Tomei *op.cit.*, p.57.
- 29: P.G. Ruf, *S.Francesco e S.Bonaventura: Un'Interpretazione Storico-Salvifica degli Affreschi della Navata nella Chiesa Superiore di San Francesco in Assisi alla Luce della Teologia di San Bonaventura*, Assisi, 1974, p.15.
- 30: Bellosi, *op.cit.* (*Cimabue*), pp.279-281, covers the discussions to date, while *ibid.*, p.165, states his opinion that "Cimabue was active in Assisi roughly between 1288 and 1290 that is, as we have already seen, during the first years of the papacy of Nicholas IV, the first Franciscan pope, the Pope who, we see now, was the most likely director of the fresco decoration in the Upper Basilica of Assisi."
- 31: Tomei, *op.cit.*, pp.55-56.
- 32: Bellosi, *op.cit.* (*Cimabue*), p.249.
- 33: *Ibid.*, pp.155-156.
- 34: *Ibid.*, p.222.
- 35: A.Smart, *The Dawn of Italian Painting, 1250- 1400*, Oxford, 1978, p. 27.
- 36: White, *op.cit.* (*Art & Architecture*), p.348, says "Giotto is not to be identified, either conjointly or alternatively, with the Isaac Master." while A.Smart, *The Assisi Problem and the Art of Giotto*, Oxford, 1971, p.118, considers that we might see "the Isaac Master and Giotto as two closely related painters with common origins in Cavallini."
- 37: M.Meiss *Giotto and Assisi*, New York. 1960, p.25.
- 38: White, *op.cit.* (*Art & Architecture*), p.202.
- 39: *Ibid.*, p.345, points to evidence, in the *Presentation* on the nave upper wall, "of an interruption or cessation of the work and of an actual over-painting of the stylistically more antiquated elements."
- 40: R.Offner, 'Giotto Non-Giotto', I & II, *Burlington Magazine*, LXXIV, 1939, pp.259-268, and LXXV, 1939, pp.96-113, argues convincingly against Giotto's authorship. White, *op.cit.* (*Art & Architecture*), p.348. Smart, *op.cit.* (*Dawn*), pp.29-30, "the attribution (to Giotto) , although still accepted by most Italian scholars and a few others, has no justification. . . . In actual fact it can be shown that the Assisi frescoes were executed by several painters who worked in collaboration, together with a band of assistants."
- 41: White, *op.cit.* (*Art & Architecture*), p.215, determines three main groups of working, and the collaboration of many workers.
- 42: *Ibid.*, p.215.
- 43: Smart, *op.cit.* (*Dawn*), p.31.
- 44: *Ibid.*, p.31.
- 45: White, *op.cit.* (*Art & Architecture*), pp.344-348.
- 46: *Ibid.*, p.344.
- 47: *Ibid.*, p.348.
- 48: Smart, *op.cit.* (*Dawn*), p.29.
- 49: J.H.Stubblebine, *Assisi and the Rise of Vernacular Art*, New York, 1985. And F.Rintelen, *Giotto und dei Giotto-Apokryphen*, Leipzig, 1912 & Basel, 1923 .
- 50: Stubblebine, *op.cit.* (*Assisi*), p.107, "For the most part it would appear that the St.Francis cycle was painted at the end of the 1320s or the earlier part of the 1330s, based, in part, on borrowings from Giotto's frescoes in Santa Croce, Florence - not only those in the Bardi Chapel but also those in the Peruzzi." Elsewhere,

- ibid.*, p.122, he notes “the St.Francis cycle appears to have been begun around 1330 and to have been completed only a decade later, in the early 1340s.”
- 51: *Ibid.*, pp.56-57.
 - 52: J.White, ‘Review, Assisi and the rise of vernacular art, by J.H.Stubblebine’, *Burlington Magazine*, 1986, pp.828-830.
 - 53: White, *op.cit.*(Recensione), p.372, sees a number of antique survivals as offering models to Duecento workers, and though the House of Neptune and Amphitrite, was not available to them, being lost until the 18th century, it is representative of this form of Roman work.
 - 54: Oakeshott, *op.cit.*, p.68, argues convincingly for the authenticity of this fragment as an original part of the 4th century mosaic. The Old St.Peter’s Apse and mosaic remained until 1592, A.M.Romanini, *Roma nel Duecento*, Turin, 1991, p.240, but three copies of it are still extant, a fresco in the Vatican Grotte, and two Mss illustrations in the Vatican Library, Cod. Barb. 4410, fol.26 and Cod. 5408, fol.29v-30r [Pl.44], of c.1590.
 - 55: Oakeshott, *op.cit.*, pp.66-67. While the right hand side of the mosaic has been altered much of the left hand side is considered to be original.
 - 56: The stereotypical dark balding St.Paul appears in the Ravenna Baptisteries c.500, and SS.Cosma e Damiano in Rome c.530.
 - 57: See Introduction Chapter, p.47 above, note 15.
 - 58: Oakeshott, *op.cit.*, p. 243, notes the lack of survivals and C.R.Dodwell, *The Pictorial Arts of the West : 800-1200*, New Haven and London, 1993, p.157, laments an isolated and inferior work for Otto II’s tomb c 983 as “even this sorry mosaic was rare for its time.” J.Beckwith, *Early Medieval Art*, London, 1969, p.184, suggests “At Rome the eleventh century was a period of complete artistic sterility. Not a single work, not even of architecture is listed in the *liber pontificalis*.”
 - 59: This places the work in the interval between the two major periods of iconoclasm, when both icons and the artists involved with them could be expected to move out of Constantinople. The declaration by Emperor Leo III in 726 ordered the destruction of all images and icons as idols. Resistance to this resulted in bitter conflict in the Eastern Church. Subsequently in 787 icons were again recognised, with the degree of veneration to be paid them specified. Renewed antagonism to such veneration, however, led to Leo V ordering the removal of icons again in 814. This “Second Iconoclastic Controversy” continued until 843 when icons were finally recognised and restored to Churches.
 - 60: Dodwell, *op.cit.*, p.146.
 - 61: “Work lines” is the phrase given to denote the organisation of the mosaic tesserae into regular chains of tone and colour, straight or curved, which follow contours and the shape of features of, for example, a face. They can be equated with the brush strokes of a painter’s work. The representation of *St John Chrysostom* in the Palermo Cappella Palatina [Pl.85] offers a good example of such usage. This technique should be seen as an alternative to that which arranges tesserae randomly to disguise facture. See Oakeshott, *op.cit.*, pp 20-24.
 - 62: There is general consensus on this. O.Demus in *The Mosaics of Norman Sicily*, London 1949, p.371-2, argues that Roger II could only obtain the expertise for the initial work in Cefalù and the Cappella Palatina from Constantinople, and outlines the relationships and contacts, friendly and hostile, between Norman Sicily and Byzantine centres, including Constantinople, from the 1140s to 1185, to demonstrate the availability of imported Greek skills and workers to feed the

- various phases of Sicilian mosaic execution.. In *ibid.*, p.418, he sees the 1180-90 work in Monreale as dependent on “the arrival of a considerable number of artists forming a well-organised workshop.” D.T.Rice, *Art of the Byzantine Era*, London, 1963, p.162, sees Cefalù and the initial 1140s work at the Palatina as carried out by Greek craftsmen, but, on p.164 sees the Palatina 1150’s nave as “work certainly attributed to Sicilian and not Greek craftsmen”. Then, on p.166, he cites Kitzinger as confirming that several teams of workmen must have brought current Byzantine developments to Monreale in the 1180s.
- 63: Dodwell, *op.cit.*, *op.cit.*, p.167.
- 64: O.Demus, *Romanesque Mural Painting*, London, 1970, p.82
- 65: Dodwell, *op.cit.* p.171, sees the S.Clemente paintings as following Cassinese miniatures directly, while Demus, *Romanesque*, *op.cit.*, p. 83, suggests common Byzantine sources for Monte Cassino and S.Clemente.
- 66: Oakeshott, *op.cit.*, p 243-244.
- 67: Demus, *op.cit.* (*Romanesque*), p.86.
- 68: The original apse with its mosaics was destroyed in 1592 in the rebuilding of the Basilica. A c.1590 copy sketch [Pl.44], Vat. Lat. 5408, fol. 29v-30r., in the Vatican Library shows its general form including Innocent III’s alterations.
- 69: Oakeshott, *op.cit.*, pp 295-29, and O.Demus, *The Mosaics of San Marco Venice, 13th & 14th Centuries*, Vol.I. London, 1949/50, p.223, sees the work of two masters involved in the *Agony in the Garden* repeated in S. Paolo so much so that, “the mosaic of the apse of S.Paolo fuori le Mura . . . shows more than merely the influence of Venetian mosaic art: it was in large part the work of Venetian mosaicists.”
- 70: *Ibid.* p.224, Demus says “The activity of the Venetian mosaicists does not seem to have exerted any further influence beyond the twenties or perhaps the thirties of the century. . . . and no such influence, to my knowledge, has ever played a part in the great renaissance of Roman mosaic art of the late thirteenth century. Torriti, Rusuti and Cavallini drew the elements of their style as well as their technique not from Venice but directly from Palaeologan Constantinople.”
- 71: Romanini, *op.cit.*, p.338, suggests the pictures are from the cycle painted by Vasari for Urban I) but Vasari himself is not too specific. Vasari, G., *Le Vite de’ Più Eccellenti Pittori Scultori ed Architettori, scritte da Giorgio Vasari, Pittore Aretino*, ed. G. Milanesi, Florence, 1900, pp. 362-363, says that Margaritone, after doing some work in Arezzo in 1275, returned to Rome, where he was held in high regard by Pope Urban IV, “per fare alcune cose a fresco di commissione sua nel portico di San Pietro, che di maniera greca, secondo que’ tempi, furono ragionatevali.” The particular paintings cannot be positively identified here and there is also a seeming incompatibility between the 1275 date and the period of Urban’s pontificate 1261-64, undermining the report’s claim to accuracy.
- 72: Tomei, *op.cit.*, p. 49, in the context of work in Assisi and suggesting Torriti’s possible authorship of the St. Peter’s fragments outlines the varied opinions concerning the dates of these. *Ibid.*, p.50, reports a later, 1980, suggestion, by Wollesen that the Sancta Sanctorum paintings could have preceded the St.Peter’s fragments. Still more recently Bellosi, *op.cit.* (*Cimabue*), p.85, positively attributes them to Torriti and dates them to the Nicholas III papacy.
- 73: Romanini, *op.cit.*, p.283.
- 74: P.Lasko, *Ars Sacra*, New Haven and London, 1994, p.163-4, “The date of the treatise has been estimated as early as the ninth or as late as the thirteenth century, but nowadays the examination of all the internal evidence has made out a very

convincing case for the early twelfth century and for a German provenance.” S.M. Viñas, ‘Original written sources for the history of mediaeval painting techniques and materials : a list of published texts’, *Studies in Conservation: The Journal of the International Institute for Conservation of Historic and Artistic Works*, Vol.43, No. 2, 1998, pp 114-123, in p.116, under the title *Schedula diversarum artium* — an alternative title found in one of the earliest manuscripts — lists the range of the treatise’s disputed dates of writing : “Lessing dated it to the ninth century, Leiste, Raspe, Degering and Theobald to the tenth, Hendrie to the first half of the eleventh, Ilg to the second half of the eleventh or the first half of the twelfth century, Dodwell, and Hawthorne and Smith to the first half of the twelfth century, Bourassé to the second third of the twelfth century, and Eastlake, Guichard (in Escalopier’s text) and Texier to the latter part of the twelfth century or the thirteenth century”. Later he notes *ibid.* p.116, “palaeographers have dated the Wolfenbüttel and Vienna manuscripts (the oldest known) to the twelfth century. The most recent studies (those by Dodwell and by Hawthorne and Smith) also support this opinion.” In Theophilus (Dodwell), *op.cit.*, p.xxxiii, the arguments are rehearsed for the different dates and a conclusion reached that a date for the original text is most likely to be between 1110 and 1140. Hawthorne and Smith, *Theophilus* (Hawthorne & Smith), *op.cit.*, p.xvi, concur in this matter of dates. They also provide, *ibid.* pp.xvii-xxiv, a comprehensive list of known copies of the treatise (which agrees with that of Viñas apart from his noting the most recent 1987 German edition and theirs is more fully described and accessible). The surviving early manuscripts are : two from the twelfth century, three from the thirteenth century, one from the fourteenth century and one from the fifteenth.

- 75: Cennini (Tempesti) *op.cit.*, p.9-10, notes the first known copy is dated 1437 and inscribed “*ex Stincarum*”, the Florence debtors prison. This is no longer considered autograph, and it seems more likely that the treatise was written earlier in the late 1390s in Padua. *Ibid.*, pp 8-9, reports that, from what little officially recorded information was available (gleaned from the Archivio di Stato di Firenze, the Padovan ones having been lost in a 1420 fire), Cennini was well established in Padua by 1398. He lived in the district of San Pietro, was in the service of the city’s Signore, Francesco da Carrara, presumably as a painter, and was already married to a Paduan lady. He had probably been there for two years since he had acquired citizenship. Moreover, it is thought that he must have arrived there just after the death of his master Agnolo Gaddi in 1396, for although he claimed a 12 year apprenticeship with Agnolo, Cennini (Thompson), *op.cit.*, p.2, there is no record of his matriculation or enrolment in the painters’ guild in Florence. Nonetheless, as Tempesti points out, Cennini (Tempesti), *op.cit.*, p.11, there is little doubt that his treatise was written in Padua since it exhibits Paduan words and usage rather than Florentine ones.
- 76: J.White, “Cavallini and the Lost Frescoes of S.Paolo” *Journal of the Warburg and Courtauld Institute*, XIX (1956). pp.84-95, and White, *op.cit.* (*Birth and Rebirth*), pp.47-50.
- 77: Made for Cardinal Barberini in 1634 these are in Cod. Barb. Lat. 4406, Rome, Vatican Library.
- 78: A.Martindale, *Gothic Art*, 1967, London, p.176, “by the end of the twelfth century large paintings of this kind were rare in northern churches. Architects made little or no provision for them — at least in the provision of large areas of flat wall

- space — and religious narrative was to be found in stained glass windows. To large extent the mural painter had been superseded by the painter-glazier.”
- 79: Lunghi, *op. cit.*, p.23
- 80: G.Morello, & L.B.Kanter, *The Treasury of Saint Francis of Assisi*, Milan, 1999, pp.136-137.
- 81: M.Barber, *The Two Cities, Medieval Europe, 1050-1320*, London, 1993, p.497.
- 82: Oakeshott, *op.cit.*, p. 296-297. Besides restorations after a major fire in 1823 “... a complete reconstruction of the apsidal mosaic also had, apparently, been carried out before the fire.”
- 83: Vasari, G., *Lives of the Most Eminent Painters Sculptors and Architects*, trans. G. Duc de Vere, 10 Vol., London. 1912-14, p.3.
- 84: Romanini, *op.cit.*, p.334,
- 85: *Sancta Sanctorum*, *op.cit.*, passim, describes the recent cleaning and restoration completed in May 1995.
- 86: Bellosi, *op.cit. (Cimabue)*, pp.67-93, explores the Sancta Sanctorum frescoes with a focus on Cimabue’s influence.
- 87: *Ibid.*, pp. 82-83.
- 88: Sindona, *op.cit.*, pp. 86-87, 99-100 and 114-115, reports and illustrates the similarities. But, apart from the Pisan St John, the dates of these various works attributed to Cimabue are subject to conjecture with diverse opinions on their chronologies. See pp.135-141 above for discussion on Assisi Upper Church frescoes. As regards the *Naming of the Baptist* mosaic, he looks, *ibid.*, p.87, for an early c.1270-72 dating, and since this might conflict with Cimabue’s recorded sojourn in Rome, noted *ibid.*, p.83, he suggests that cartoons could have been provided in 1271. Bellosi, *op.cit. (Cimabue)*, p.126, considers 1280 as the most likely date for Cimabue’s participation in the baptistery mosaics. White, *op.cit. (Art and Architecture)*, p.198, suggests that Cimabue’s influence applies here rather than any direct involvement, pointing to the possibility that this mosaic possibly might not have been carried out until the 1320’s.
- 89: Romano in *Sancta Sanctorum*, *op.cit.*, pp.777-778, writes of “la sostanziosa immisione bizantineggiante” and that the vestments and figures “fanno pensare a modelli balcanici duecenteschi”, since the similarities with contemporary work in Sopoçani, are striking.
- 90: O.Demus, *Byzantine Art and the West*, London, 1970, pp.225-6, “it ought to be kept in mind that the revolution of Italian art was preceded by a revolution in Byzantine painting which reached its critical point in the third quarter of the thirteenth century. A single monument, such as the royal church of Sopoçani, houses figures which seem worlds apart but are not separated in time more than one or two decades at the most. Some of the figures of patriarchs or prophets are works in an obsolete, provincial style in which the linear effects of late Comnenian art still play a part, while others show the sovereign mastery of an artist who knew how to give his figures full plastic volume and great statuesque dignity. . . . We have good reason to assume that something like this art was transferred to Italy by Greek painters of the kind mentioned by Vasari - fresco painters whose work is now lost, some of it, perhaps, hidden behind the acres of loquacious Trecento paintings.”
- 91: Although we have no original manuscript of Theophilus’ treatise, we do have a number of early copies,(see note 74 above), to indicate that it was still being copied and presumably consulted over our period. Cennini’s *Il Libro dell’Arte*

- written between 1400 & 1437 (see note 75 above) is a manual of good workshop practice garnered from the Florentine Trecento.
- 92: From around the beginning of the 1200's changes in attitudes to the Divine and Holy figures of the Christian religion became very evident. Empathy with these characters was looked for rather than any simple concentration on their veneration. The predominance of the *Christus Patiens* and the subsequent disappearance of the *Christus Triumphans* in the Duecento is a clear symptom of this in contemporary painting. Duecento texts also confirm this new direction. A most obvious example of the early 13th century's more humane approach to Christ and his Mother is to be found in the officially sanctioned, c.1260-63, *Legenda Maior* by St. Bonaventura. See translation in Okey, *op.cit.*, 368. Here St. Francis' institution of the crib at Greccio, firmly dated at 1223 (three years before his death) stresses the humanity and poverty of the Infant Christ and His Mother and clearly sought empathetic response. Significantly Francis had sought and obtained Papal approval from Honorius III for this. Of a similar date, c.1260, is an influential book by the Dominican Jacobus de Voragine, *The Golden Legend, Readings on the Saints*, trans, W.G. Ryan, Vol. I & II, Princeton, 1993. This, as an example, in Vol I, pp. 203-207, expanded on the Passion of Christ, detailing the tortured human experience of Jesus' treatment before and during the Crucifixion. It also carried narratives of the Virgin, her parents, John the Baptist, St. Andrew and other saints which related details of their worldly existence. *Ibid.*, Vol II pp. 149-154, tells of Mary, her family and her early life. A later Franciscan book, c.1300, by Giovanni de Caulibus, *Meditations on the Life of Christ*, trans. I. Ragusa & R.B. Green, Princeton, 1961, offers similar humane versions of the lives of people surrounding Christ, inviting readers to empathise and meditate on their feelings. For example in p.38, he follows and positively reinforces the sympathetic appeal of Greccio, noted above, in inviting a response. "You too who lingered so long, kneel and adore your Lord God, and then His mother, and reverently greet the saintly old Joseph. Kiss the beautiful little feet of the infant Jesus who lies in the manger and beg His mother to offer to let you hold Him a while. Pick Him up and hold Him in your arms. Gaze on His face with devotion and reverently kiss Him and delight in Him." x
- 93: The *Orans* type has Mary in a straight frontal pose with both hands presented openly and symmetrically to the front in the older, early Christian and antique, gesture of prayer. The *Hodegetria* type (ἡ Ὁδηγήτρια) has Mary, holding the infant Jesus on her arm and directs attention to him with the other hand. The name derives either from this gesture, with Mary as "Guide" indicating the Christ Child or from the Hodegon, the church of "the Commanders" (τῶν Ὁδηγῶν), in Constantinople where the original version of this icon was once kept. Byzantine tradition has this original attributed to St. Luke, and tells that it had Mary's blessing, hence its veneration. See Ouspensky & Lossky, *op.cit.*, pp. 80-81. Variants of the *Galaktotrophousa* type have Mary suckling Jesus and so is the prototype for the *Virgo Lactans*. The *Eleousa* (Ἐλεοῦσα), affectionate or loving, and later called *Glykophilousa*, shows Mother and Child in close embrace or kissing. These forms, or derivatives of them, were in common use throughout the Trecento and later. The *Nikopeia*, a hieratic, authoritarian and forward facing Madonna, who holds and formally presents the Infant solemnly in front of her, largely fell out of favour as the more intimate forms expressing the humanity of Jesus and his mother became more popular. The name derives from *Nike*, victory,

- since an icon of this type was believed to have ensured victory against a besieging army after it had been paraded along the city walls.
- 94: S.Walker & M.Bierbrier, *Ancient Faces : Mummy Portraits from Roman Egypt*, London, 1997.
 - 95: Gombrich, *op. cit. (Art and Illusion)*, Ch.V. p.126ff., He describes the process of “schema and correction” (p.127) which he observes is central to all creative works. This he says can be expressed in “the formula that making comes before matching.” Gombrich, *op.cit. (Heritage)*, p. 23.
 - 96: *Ibid.*, p.7, points to a late medieval conflation of lustre, specular highlight, and general modelling. “Is it still a highlight here, conceived as a reflection, or is it now meant as modelling? ... It is likely the question would no longer have been understood by the painter who had ceased to refer to nature as his guide.”
 - 97: A.Ladis, *Taddeo Gaddi, Critical Reappraisal and Catalogue Raisonné*, London ,1982, *passim*, shows all Gaddi’s paintings have the light coming from the side away from which the Virgin turns. A further point of interest, in pp.17-18 in comparing the two pictures comments on form and graphic dependency, and on closeness or minor departures of style, while p.82 considers the matter of frontality, but there is no mention of the quite radical change in lighting orientation and its very obvious effects.
 - 98: D.C.Shorr, *The Christ Child in Devotional Images in Italy during the XIV Century*, New York , 1954.
 - 99: Zanardi in *Sancta Sanctorum, op.cit.*, p.237, reports that some parts of the 1500’s repainting were removed in undocumented cleaning, probably during the 20th century.
 - 100: The dates and attribution of the Stefaneschi Altarpiece are subject to much debate and conjecture, earlier thoughts range from Gnudi c.1330, through Venturi, Toesca & Cecchi c.1320 to an argument, by J. Gardner, for their being pre-Arena Chapel, ‘The Stefaneschi Altarpiece: a Reconsideration.’ *Journal of the Warburg and Courtauld Institutes*, XXXVII (1974), pp 57-103, with p.91 “The Stefaneschi altarpiece was designed by Giotto before the frescoes of the Arena Chapel.”, and p.103 sees them “...provide a fitting prelude to the astonishing mastery of the Arena Chapel frescoes.” Later J White, *Duccio: Tuscan Art and the Medieval Workshop*, London, 1979, p.140ff. argues for a workshop production rather than Giotto’s direct involvement and places it, at the earliest, “in the late teens”, and still later in White, *Art and Architecture, op.cit.*, 1993, p.343, suggests it as the product of a “temporary atelier” with not much more than a commercial association. G.Previtali, *Giotto e la sua Bottega*, Milan, 1974, p.105, places it at 1318-1320 just after the Assisi Lower Church works.
 - 101: Cennini (Thompson) *op.cit.*, pp.14-15, advocates, in Chapter XXVII, copying from good masters, and then, in Chapter XXVIII, the copying from nature.
 - 102: *Ibid.*, Chapter LXVII, p.45 , shading is to be applied below the chin, mouth, nose and eyebrows.
 - 103: *Ibid.*, Chapter VIII, p.6.
 - 104: For dates of Assisi nave see discussion above pp. 136-141.
 - 105: C.Trevarthen, in Gregory, *op.cit. (Artful Eye)*, pp.181-186,
 - 106: *Ibid.*, p.181. “Analyses of the use of space in pictures by artists points to a pervasive asymmetry which carries the interest across the picture space upwards and to the right. In a painting affected by this principle, the theme-setting material is at the lower left and the main topic or point of greater interest lies towards the top right hand corner.”

- 107: See Note 100
- 108: See Note 100.
- 109: H.B.J.Maginnis, "Assisi Revisited : Notes on recent observations." *Burlington Magazine*, 117(1975) p.511-517, finds the Pietro Lorenzetti frescoes follows the Giotto Workshop Crossing and North Transept projects, dating them, p.515, to "one single campaign between the years 1316 or 1317 and 1319."
- 110: See Note 96.
- 111: Martindale, *op.cit.*(*Gothic Art*), p.181.
- 112: See note 109.
- 113: Shorr, *op.cit.*, pp.1-2 "although Virgin and child are now represented as human beings, the change is less marked in the figure of the Virgin, who still remains the majestic Mother of God. The Child, on the contrary, is now seen less as a symbol of Deity than as a human infant, active and responsive to his Mother and to the world about him."
- 114: Analysis of Virgin's poses based on Shorr's images is in Appendix II.
- 115: St.Dominic had died in 1221, Peter Martyr in 1252 and Thomas Aquinas in 1274, Raymond de Peñaforte in 1275, Albert Magnus in 1280, Pope Innocent V in 1276 and Benedict XI in 1304.
- 116: J.Richards, *Altichiero, An Artist and his Patrons in the Humanist Courts of the Late Trecento*, Cambridge, 2000, p.203 ff., explores the multiplicity of Altichiero's recording of individuals in the late Trecento Paduan court and humanist circles in the Oratorio di S.Giorgio. *Ibid.*, p.203, he writes "excluding the votive fresco the number of portraits in S.Giorgio add up to something between thirty and forty, depending on how strictly one applies the criteria. With the votive fresco the number may exceed fifty, an extraordinarily high count at any time and unprecedented in the Trecento."

CHAPTER 4

THE OMISSION OF EYE-LIGHTS IN DUECENTO AND TRECENTO PAINTING

For all the attention paid to it elsewhere there is one aspect of specular reflection which is remarkably absent in Duecento and Trecento works. In the depiction of faces 13th and 14th century artists, despite evident attempts to provide other mimics of actual lighting effects, do not paint any high lights in the pupil or iris of the eye. They are not alone in this, for no traces of such highlights are to be found in any paintings from around the 3rd century A.D. until the 15th century. In fact, there is little indication of any general use of distinct highlights appearing in painted eyes until well into the Quattrocento in Italy, when they appear in the works of painters like Filippo Lippi, Botticelli, or Lorenzo di Credi, although further north, several decades earlier, the work of Campin [Pl.412] and Jan van Eyck [Pl.413], carried them as a regular feature. It is perhaps not insignificant that Filippo Lippi provides one of the earliest instances in the 1437 *Tarquinia Madonna* [Pl.418], when it seems likely that he had just returned from a visit to Flanders.¹

The eyes, with their transparent lens-like nature, each effectively present a convex mirror — in this the term specular is exactly correct — to offer a distinct reflection of any light incident from a wide range of angles, both horizontal and vertical, in front of the subject. Reflection here provides, not just some basic geometrical information of the spherical qualities of the eye to add to suggestions of the detailed three-dimensional shape and volume of one of the major features of a face, but also a very definite indication of the eye's animation which implies the intelligent vitality of the person involved. Various seen as a “window of the soul”² and as a focus for non-verbal communication, when “eye contact” is all important, the eye offers, in its sparkling transparency, the honesty of intelligent intercourse. The

reflective glint under discussion is an essential physical proof of this transparency and hence integrity. The description “shifty-eyed” follows from the absence of such openness, or, yet again, the demure downcast look becomes, for the shy maid, a protection against the intrusion into her modest privacy. At the same time the open gaze of the “friendly” Westerner is felt to be an aggressive insult in the more genteel and reticent society of Japan. It is likely then, that there are some cultural implications involved in this matter, though the open gaze of much early Western art, Antique, Medieval or Renaissance, might have suggested that there is not such a big cultural divide in this particular matter between these periods and our 20th century Western notions. Nonetheless, the consistent *non-appearance* of eye-lights in, it would seem, all surviving works, from around the 2nd and 3rd centuries A.D. until the middle of the 15th century A.D., prompts questions as to why the effect was over-looked or deliberately omitted. At the same time the seemingly total lack of any sign of it in all available works from these centuries would suggest this is unlikely to have resulted from the fortunes of survival.

The Nature of Eye lights

If we accept the eye as approximately spherical, the effects of reflected light will follow the appearance of those reflections we would expect to see in a convex mirror. Perhaps one of the most renowned mirrors of such shape is that in Jan Van Eyck's *Arnolfini Wedding* [Pls.414 & 415]. This mirror offers a convenient analogue of the eye while, alongside it, Giovanna's eyes can demonstrate the effect. Of course Van Eyck might have concocted the whole scene, or need not have strictly followed actuality in his recording of it. The first suggestion is patently unlikely, given the general coherence of overall effect and consistent detail, and, while he clearly made

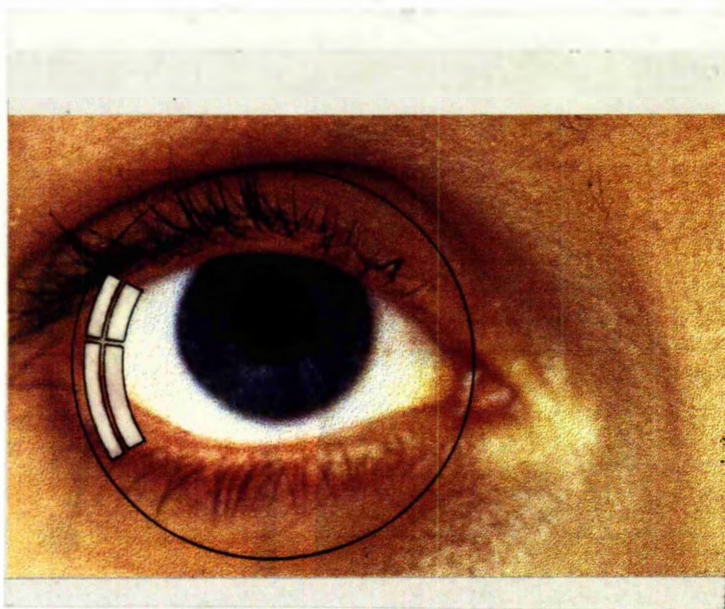


Fig. 26: *Eye with reflection sketch superimposed,*
retouched photograph and line drawing.

some adjustments to suit compositional requirements, his general depiction of visual phenomena here is sufficiently accurate for our purposes.

The illumination for the far wall is shown as being the large window on the left, and, with no indication of direct sunlight, this acts as a large diffuse source. The window opening is pictured as extending quite deeply into the picture. Its further edge ends by being quite close to the far wall plane. Consequently the horizontal angle of incident light at the mirror is quite oblique and, with the heights of window and mirror being similar, it arrives almost horizontally. The mirror then gives us an idea of how the specular reflection would appear on the surface of an eye lit by a large diffuse source well to its right and at a very low angle, horizontal in fact. The result is a sizeable reflection, found at the proper right edge of that “eye” extending approximately from 8 o’clock to 10 o’clock [Pl.415]. This we can see, if the mirror effect is superimposed on an frontal view of an eye [Fig.26], would unfortunately place the shine on the white of the eye, and not on the iris or pupil, making it difficult to register in paint. Even such a peripheral effect is not reported on Jan Arnolfini’s eyes [Pl.416] as his gaze and eyes are not directed straight out, but to his left and away from a second window which illuminates the couple. This window, located to the left, is apparent in the modelling, and its recess is clearly reported in the mirror. But where the gaze, and with it the iris and pupil of the eye, is turned towards the window, as for Giovanna Arnolfini, [Pl.417], then, with the eye being nearly spherical and the geometry still largely correct, the reflection takes its place in a position, which we see from our point of view, as occupied by the pupil and iris. Nevertheless, Van Eyck avoids depicting a broad area of highlight in the eye which would have been consistent with the large window implied by his soft general modelling, and settles for a neat sharp reflection in each of her eyes. This could well have been a conscious and

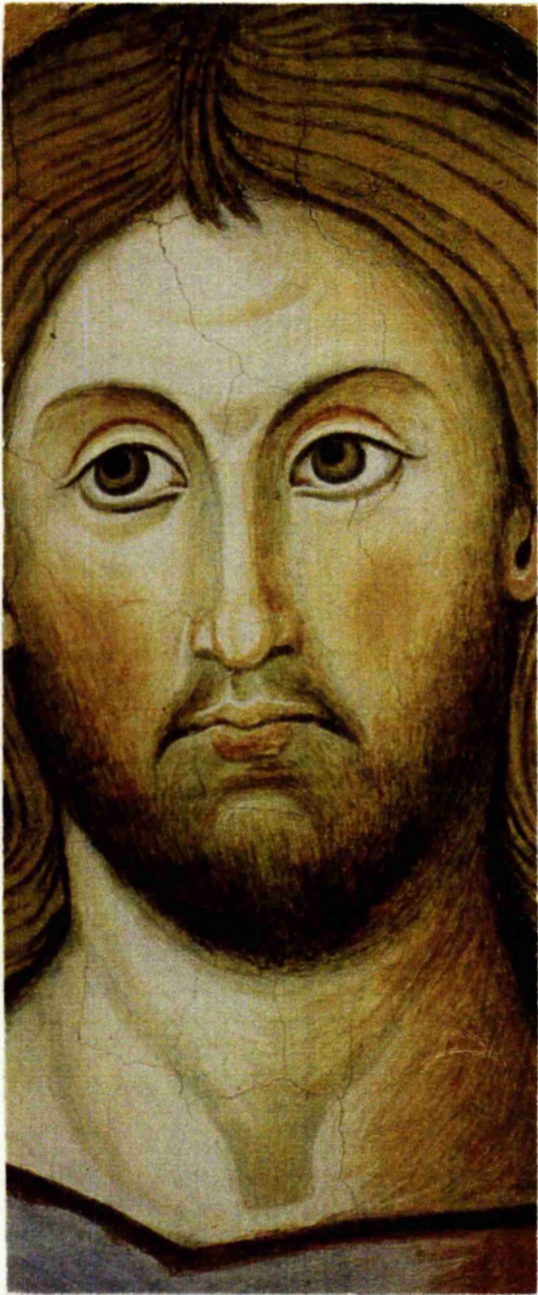


Fig. 27: *Christ*, detail of *Enthroned Christ*, fresco, c.1278-80, Rome, Sancta Sanctorum.



Fig. 28: Modified version of Fig.27
Eye-lights added.

discreet choice since a broad reflection could well have left the face with a vacuous gaze rather than a lively one, and Van Eyck opted for an intelligent sparkle.

Returning our attention to the mirror it can readily be seen that, if the figures portrayed in the centre of the mirror were replaced by a source of light, another window perhaps, then we should find, with such frontal illumination, a bright reflection sitting nicely in the centre of the model of the outward gazing eye that is the mirror.

Another way of illustrating the pictorial effectiveness of such reflections, can be provided by deliberately adding highlights to a early painting where they are absent. One such example of omission is the *Sancta Sanctorum Christ* [Fig.27]. A striking display of virtuosity, this superb face has no indication of any reflections in the eyes. An idea of the difference which such sparkle provides, albeit to modern eyes, is shown in comparing the “un-corrected” version with a modified version in [Fig.28].

This 13th century *Christ* is not an exception. Looking widely in surviving Italian Duecento painting, and continuing on through the Trecento into the Quattrocento, there is no sign of these high-lights: none in Cimabue’s, Giotto’s or Duccio’s works, nor in any works up to and including those of Gentile da Fabriano or Masaccio.

Long Period of Omission of Eyelights

13th and 14th century Italian painters were not unique in overlooking eyelights in their paintings. There is a long period when there appears to have been a quite universal neglect, or avoidance, of such elements in images in both Eastern and Western art. Such an omission is apparent over several centuries, though in still earlier periods clearly artists did consciously aim to provide this animating glint in their subjects’ eyes. However before investigating possible early examples of inclusion or



Fig. 29 : *Christ*, detail of Apse, mosaic, c.625-650,
Rome, Baptistery of St. John Lateran, Chapel of St. Venantius.



Fig. 30 : Detail of *Restoration Working Diagram*, 1946-47,
(From Oakeshott, *The Mosaics of Rome*).

omission of these effects it is prudent to be aware of some pitfalls, particularly when viewing reproductions.

The poor state of preservation of many of the limited number of surviving paintings from earlier periods frequently complicates matters. Often what, at first sight, arouses our interest as a possible light in the image's eye, turns out to be some local damage which has resulted in local loss or abrasion of pigment. In these cases a more attentive inspection reveals the twinkle as just occurring in one eye, where such damage has occurred. The defect becomes evident, and the sad unbalanced nature of the damaged face is then obvious. We can also be looking for the absence, or presence, of eye-light effects in mosaic works as well as in painting. In some of these the deliberate off-setting of tesserae, with the aim of offering a scintillating effect, can provide spurious effects. The slight off-set of one tessera in a strategic spot might produce a local glint and be captured on a reproduction as a highlight implying eye sparkle. A scrutiny of the original, or even a look at an alternative reproduction, can correct the misapprehension.

Further complications can occur with intervention of restoration work. For example, an apparent incidence of 7th century eye-lights is evident in the apse mosaic of St. Venantius Chapel of the Lateran Baptistery [Fig.29]. The *Christ* there has quite distinct highlights in His eyes. However, there is no guarantee that these are as original, and could well be spurious amendments. Oakeshott notes that documented 1946-47 restoration work found signs of an earlier "extensive repair" which involved the whole upper face [Fig.30].³

As far as this absence of highlights is concerned, a preliminary look through the centuries tends to indicate this was consistently true in mosaic, painting and



Fig. 31: Charlemagne's Ada School,
St. Matthew, c.790-800,
 Harley Gospels,
 MS. 2788, fol. 13v., ,
 London, British Library.



Fig. 32: *St. Matthew*,
 Detail of Fig.31above.

illustration, back, at least, to the 6th century A.D. There is little sign to be found of positive attempts at depicting any illusion of a glint in the eye. Admittedly my assessment here is based in part on reproductions, but the nature of these highlights is quite pronounced and, in the main, unmistakable. Additionally, where a second look has required closer inspection of possible occurrences of these phenomena, the reproductions often prove adequate in showing the true nature of any misleading clues, even in cases where recourse to any alternative print is not made. For example, an illustration of a Carolingian *St. Matthew* [Fig.31], from the late 8th century, has the Saint with off-centred pupils which lets his irises give an initial impression of high lights. A closer look [Fig.32] reveals the detailed nature of this depiction and proves it to be spurious. Nonetheless, the effect is certainly interesting, and must have been intended, for the same arrangement is used in further illustrations, and *St. Mark* from the same work shows similar working.

In mosaics similar misleading examples appear. The impressive c.1100 *Pantocrator* [Pl.75] in the central dome of the Daphni Monastery might be seen, in some enlarged reproductions, to have some fine lights articulating the centres of his eyes, but both actuality, and a closer look at photographs, reveal these as deceptive effects arising from small random losses, discoloration of mortar or perhaps local irregularities in the tesserae. These pseudo-highlights are also not consistent from one eyeball to the other, and, besides, in no way conform to the general modelling of the face itself. Perusal of earlier mosaics, such as those at Ravenna's *St. Vitale* from the mid -6th century A.D. leads to similar conclusions [Pl.60].

While one would expect these more robust mosaics to have retained the best indications of original quality and so of artistic intentions, there are also a number of icons of the Justinian period which have miraculously survived in good condition.

Thanks to the privileged position of the Monastery of St. Catherine in Sinai — an island of Christianity in Islamic territory — they avoided destruction in the periods of iconoclasm. One particularly interesting icon here, considered to be from an Imperial Constantinople workshop, is the 6th century Sinai *Christ* [Pl.112].⁴ Here the quality of the reported effects of light and shade, both in general modelling and smooth highlights, is evidence of keen and accurate observation and a mastery of technique. These skills allowed for the successful translation of visual stimuli into a very acceptable illusion on the panel. However, the lighting configuration which would have provided for the play of light shown here has a main source of quite soft illumination, that is one of considerable area, like a fair sized window, and certainly not a candle or lamp. This would have been found at around 20° to Christ's right and at about the same angle of elevation. It would, though, have produced a noticeable and relatively large reflection within the iris and pupil area of each eye. But no such effect or token reference appears. A modern commentary does not specifically note the lack of reflected eye-light, but feels constrained to remark on the “distant focus of the eyes”, suggests this denotes “timelessness” and equates it with Christ's “divine nature”.⁵ Perhaps there is a measure of truth here. That, though, suggests a choice, and, if one is made, perhaps this is a conscious omission which becomes a precedent for later usage. At the same time other contemporary icons of saints [Pl.113] rather than Christ also omit the eye-lights, just as contemporary mosaics did.

The Sinai *Christ*, however, is the earliest work I have come across, thus far, where a reasonable assessment of the technical expertise involved argues for a likely, or possible, intelligent awareness of that bright sparkle of light in the eye, but where expression of this on the image is denied. In looking for, and testing still earlier surviving works, of similar levels of general technical accomplishment, we have to go



Fig. 33 : *Pacuvius Proculus and his Wife*,
fresco, c.60-79 A.D. from Pompeii,
Naples, National Archaeological Museum.

back to the 2nd or 3rd centuries A.D., and it is at this time we can encounter examples of specular reflection in eyes.

Eye Lights in Antique Periods

A number of encaustic and tempera mummy portraits from the Roman communities in 1st to 3rd century Egypt show sensitive realism and vivacity, and many of these rely for their effective animation on the telling use of confidently placed eyelights. In a recent exhibition in the British Museum of around 100 examples, 60, generally those more expertly executed than the rest, display these effects.⁶ *Portrait of a Bearded man* [Pl.40] is a typical example of the lively nature realised. Other survivals give every indication of continuity in the employment of such effects over the previous three or four centuries of the Imperial Roman period, and it is likely that they appeared in much earlier works. From a century earlier, the Naples Archaeological Museum has a double portrait of *Pacuvius Proculus and his Wife* [Fig.33]. This, a fresco from Pompeii, was probably painted between 60 and 79 A.D. It shows the lady with distinct highlights positively placed at about “10 o’clock” in each iris. These accurately match the position and sharpness of both shadowing and skin highlights. Her husband, while having facial modelling to match hers has, now at least, no signs of eye-lights, but then it is just possible, though I must admit unlikely, that these could have been lost, since there are clear indications of some damage in the critical areas of both his eyes. Nonetheless, there are still earlier paintings in the same museum with unambiguous presentations of eye reflections. There are some 50-60 B.C. frescoes, originally in the Villa of P. Fannius Sinistor at Boscoreale, showing well modelled figures all with sparkle in their eyes. A good example is the *Personification of Macedonia* [Fig.34 facing page 216] whose highlights, effectively placed with a



Fig. 34:
Personification of Macedonia,
detail of fresco, c.50-40 B.C.,
from Boscoreale,
Villa of P. Fannius Synistor,
Naples,
National Archaeological Museum.

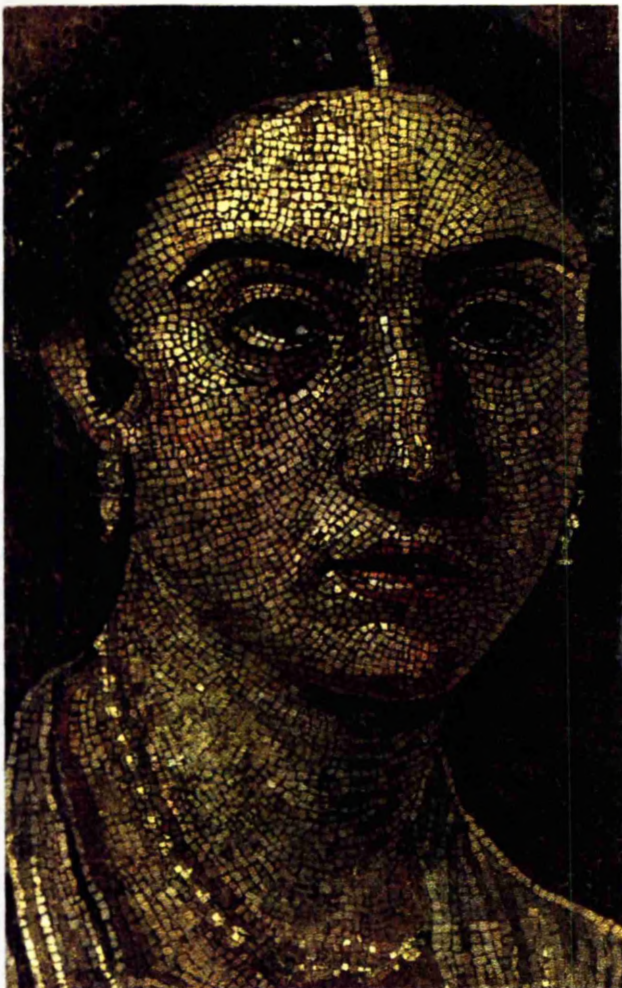


Fig. 35: *Portrait of a Woman*,
mosaic, 1st century A.D.,
from Pompeii,
Naples,
National Archaeological Museum.

sharp precision, are consistent with the crisp illumination implied by the general modelling.

In the field of mosaics the Naples Museum also provides a very clear example of the depiction of eye-lights within a more general display of effective modelling. This is *The Alexander Mosaic* [Pls.22 & 23], considered to be a late 4th century B.C. painting copied in the late 2nd or early 1st century B.C.⁷ Consistent attention to detailed highlights is carried through to provide some lively glints in the eyes of both men and horses. However, although a common unifying directional sense, left to right, is observed for overall modelling, the precision of the placing of the sparkle in each pair of eyes is less consistent. A vigorous animated picture is evidently the aim and some of the eye-lights appear to be positioned more freely, for effect rather than accuracy. The sparkle of eyes was, then, a feature felt worth recording in the 1st two centuries B.C. and, if this copy was a precise one, possibly it was valued by 4th century B.C. Greek painters too. But clearly there was some selection in this matter. Other survivals of expertly executed mosaics from this same period can omit the glint in characters' eyes. Again in the Naples Museum, a sombre and subtly detailed portrait [Fig.35], from Pompeii, though felt to have Hellenistic traits, displays an awareness of all the nuances of light and shade, but does not record any highlights in the eyes. The effect is of quiet contemplation or sadness. A withdrawn and inward looking mood is captured, which might well have had its attractive spell broken by a brash awareness of our outer world, had reflections been shown.

Duecento and Trecento Indications or Non-Indications of Eye Lights

In returning to the Duecento and Trecento we might seek similar evidence of the positive choice made, on occasion, by painters to avoid eye-lights while making use of

them on others. However, it does not seem likely that later relatively higher levels of survival, and still increasingly higher ones as we continue any survey on into the late 14th and early 15th centuries, could have left us only those pictures where the artists chose to omit any catchlight in the eye and, at the same time, denied us any indication of the election of its use in others.

Nonetheless, in further intensive searches for signs of this lighting effect in the Italian Duecento and Trecento, it becomes apparent, that while this sparkle apparently cannot be found, there are signs that some need was felt for devices to give some semblance of its lively effect to faces. Alternative stratagems appear to have offered substitute expression to serve in its place. Now, where closer scrutiny, following initial attention being drawn by apparent suggestions of eye-light, still finds some accidental losses of pigment or other spurious effects, it also often reveals some devices which clearly offered surrogate sparkle. These effects are widespread and even if they are not techniques positively cultivated in workshops, they seem to be quite common habitual traits. They are not universally utilised, however, and if we look in this for a sign of choice being exercised then a concomitant of that is that they are consciously employed.

One obvious device to animate faces is the concentrated lightening of the whites in the eyes where figures are relatively small and no individual depiction of the details of the eye is practical. This we might see in Giotto's *Arrest of Christ* in the Arena.Chapel [Pls. 228 & 229].

Another device is the depiction of light coloured irises. This occurs where the picture of the head and eye is of sufficient size for obvious differentiation of the pupils, irises and whites. It is particularly noticeable in Simone Martini's frescoes in the St. Martin Chapel at Assisi. All people with "brown" eyes display light amber colouring

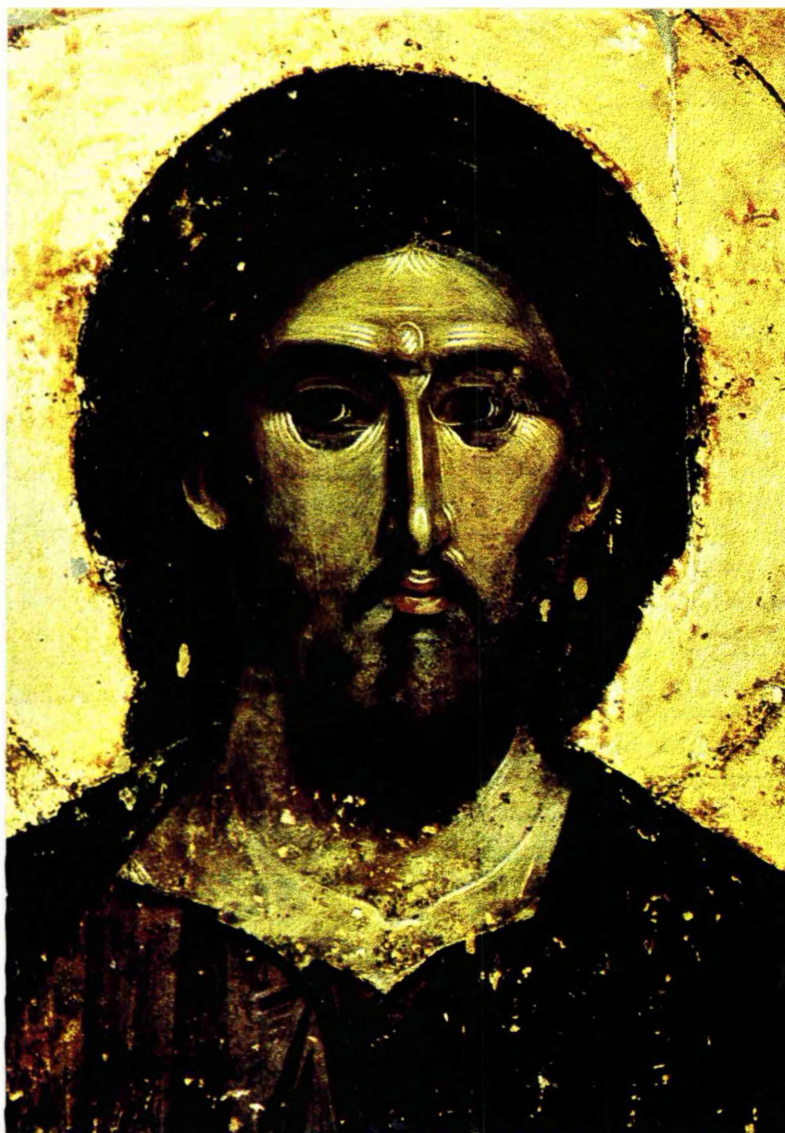


Fig. 36 : *Christ*, detail of icon, tempera, c.1260,
Mount Athos, Chilandari Monastery.

which bleaches to near white around the black, and cleanly undisturbed, pupil, leaving the impression of almost luminous roundels in full or three-quarter faces. For some profiles very close scrutiny is needed to see that there is not in fact a highlight there. The few people pictured with blue eyes have these portrayed as spectacularly light coloured, as in the scene of *Martin Renouncing the Sword*. [Pls.344 & 345]. But in this same picture the background enemy soldiers, though pictured hardly smaller than Martin or the Emperor, have no light in their eyes, via light irises or enhanced whites. This might follow from a need for a sense of distance, not realised in diminution, or the implied menace and soulless nature of the barbarians. It does, though, imply that some choice was made, and, if we seek some support for such proposition, it might be found within the same chapel in the *The Burial of St. Martin*. [Pls.346 & 347]. This shows, on the right, two similarly shaded faces, this time under cowls rather than helmets, but here the eyes are brought to life by sharply accentuated whites and also, for one of the pair, by very light irises.

We do not see much sign of lightened irises in Duccio's painting. However, his work demonstrates clearly perhaps the most widespread device. Here there is a distinct and sharply controlled lightening in the whites of eyes close to the irises. This is a patently contrived arbitrary effect, as we might see in its schematic use in the *Crevole Madonna* [Pl.269]. Such an artifice was well established in the Duecento in both Western and Eastern working. Cimabue, and Giunta Pisano, both employed similar treatments, while one particular Eastern version of its implementation emphatically illustrates the nature of the stratagem. A panel, from about 1260, in the Chilandari Monastery on Mount Athos shows Christ [Fig.36], with its final quite linear highlights, added not only to lift the various features of the face, the brows, the nose, the lips, but also to provide some accentuation in the eyes. In this case the severe linear application

draws attention to the particular location of these accents in the eye. The positioning of these very precise touches are found at the edges of the eye whites, but quite clearly, and by design, they rim the edge but do not encroach upon the iris-pupil area. The effect is evident, though perhaps not always taking quite the same dramatically linear form, in many Eastern works of the period and sets a pattern followed for subsequent works. Other painters, for instance Simone Martini or Pietro Lorenzetti, display their versions of this technique, but with them it tends to be softened and less localised. Duccio's work does, however, tenaciously pursue the technique closely even in minute detail. In the small panels of the *Maestà*, for example, the sharp pin-pricks of light in the Pharisees' eyes in *Pilate's First Interrogation of Christ* [Pl.286], appear as the sparkle of a contrived jewelled, almost starry, design. A case of the accenting of eye whites, it might be thought. But closer scrutiny [Pl.287], shows that, rather than the straight forward lightening of the entire white of each eye, special care has been exercised to provide a narrow highlight rimming one side of the iris in each case, and this despite the extremely small scale, miniaturist in fact, of each figure.

One might have anticipated that, in the reaching out towards more realistic illusion, some of the more adventurous of Italian painters, particularly in the first half of the Trecento, would have tried a touch of highlight centrally in the eyes. It does not appear to have been tried, at least at a level that has left any evidence. Instead, what does become clear from any survey of this period is while some considerable artistic attention was paid to the depiction of eyes this treatment was severely inhibited. Here the painters evidently felt constrained, consciously or unconsciously, to take only limited liberties with the tones in the iris, or even offset the pupil in it, as noted earlier in the Harley Gospel, and offer only notional contrived highlights in the white of the eye. Distinct highlights were not allowed to encroach on to the iris and no tampering

with the plain darkness of the pupil seems ever to have been contemplated in the 13th and 14th centuries. This reluctance continued on into the Quattrocento with no sign of eye-lights appearing until Filippo Lippi's 1437 *Tarquinia Madonna* [Pl.418]. Even here, and in any of his later paintings for that matter, there is still clear evidence of restraint, for soft highlights are placed in the irises and the pupils are still cleanly undisturbed. The *Tarquinia Virgin's* eyes show the arbitrary nature of Lippi's effect. The highlights are placed on the far side of her eyes and not on the side which would have caught the modelling light. A close look at the Infant tells the same story. Similar careful usage of soft effects in the iris continues on through the late Quattrocento. If the sharp pupillary images of the early 15th century Flemish painters [Pl.413] provided some stimulus for change their example was only very hesitantly followed in Italy. In this respect the habits and restraints found in the Trecento did not readily change or disappear.

Thus far only two isolated pictures with eye lights have appeared among all the other Trecento pictures studied. Both, however, are likely to have been modified at later times. In Treviso S.Francesco there is a *St. Anthony Abbot* fresco [Pl.387], which I have only seen in reproduction, that requires some investigation and closer scrutiny. But its rather roughly indicated highlights in each eye neither match one another nor seem to fit the rest of the painting. The repainted section of Ambrogio Lorenzetti's 1338 *Allegory of Good Government* has a picture of *Iustitia*, [Pl.332] with clearly indicated lights in her eyes. The companion virtues, *Magnanimita* and *Temperantia*, also part of the c.1350-60 repainting, have no such highlights, nor has any other figure in the fresco, repainted or original. Apart from the reworking in the mid Trecento a number of further restorations are recorded in the 15th, 16th, 19th and 20th centuries, so that there is every chance that later intervention has "improved" this figure.⁸

Indications of Awareness of Eye-Lights in Texts

With no sign of specular reflection seemingly to be found in the irises or pupils of Duecento or Trecento paintings we might look to the limited technical literature available from the period for any other ideas on 13th and 14th century artists' approach. We have Theophilus' *De Diversis Artibus*, from the early 12th century and Cennini's from the start of the 15th. Although we have no original manuscript of Theophilus' treatise we do have two 12th century copies, then three 13th century ones, a 14th and 15th century one to indicate this work was still being copied and presumably being consulted over our period.⁹ *Il Libro dell'Arte* is thought to have been written just before 1400, and the earliest extant manuscript, dated 1437 "in the debtors' prison in Florence", is considered a later copy.¹⁰ This is a manual of good workshop practice garnered from the Florentine Trecento and inspection of the paintings produced then generally bears this out. Unfortunately, little attention is paid, in either of the books, to any detailed execution of the painting of eyes.

Theophilus, in Book I.Chapter 6, writes of *veneda* as a colour to be used for the depiction of eyes:

"Then mix black with a little white; this colour is called dark grey (*veneda*)
With it fill in the pupils of the eyes. Add to it still more white and fill the eyes on either side. Between this colour and the pupil apply plain white and blend in with water."¹¹

Subsequently there is only one other passage, Book 1.Chapter 13, with any direct reference to eyes:

"Mix a little black with burnt ochre ; this colour is called dark red (*exudra*).

With it make strokes around the pupils of the eyes . . . with plain burnt ochre make the eyebrows, and fine strokes between the eyes and the eyebrows, (and) below the eyes . . . The eyebrows of old men or those of senile ones you make with the dark grey (*veneda*) with which you filled in the pupils. Then with plain black, you paint . . . above the eyes,...”¹²

Confusingly, and not borne out by assessment of results in any pictures, here *veneda* is clearly grey, and would be a relatively light one if it is to represent the silvered touch of age in the second passage. This would leave the pupil light toned, unless “above the eye” in the second passage is a misleading interpretation of “oculos superius” and some darkening of the pupil is intended,¹³ but this does not seem to fit in with the first passage’s advice to “fill in the pupils”. The iris gets no direct mention, with only “strokes around the pupils” implying its existence. Nonetheless, there is one thing of interest to be taken from Theophilus Chapter 6, as quoted above. This is that there should be an additional touch of white *adjacent* to the pupil, and while the wash of water would soften any abrupt effects such as we saw on the Chilandari Monastery *Christ*, the result might be consistent with Duccio’s working [Pl.269]. As far as any specific highlight within the iris or pupil is concerned, there is no mention at all, though detailed attention is given elsewhere to the exact positioning of other highlights.

Cennini, writes even less of the actual process of painting an eye, though offering so much more on flesh treatments, still more on fabrics and, quite legitimately, even more on materials and the preliminary mechanics of the painter’s craft. He mentions eyes in only a few places, but with no real indication of colour or tone or, indeed, any detail. In Chapter XXXI, he concludes his advice on drawing, “Then proceed to crisp up (*raffermare*) with a small brush, with *straight* ink, marking

out the folds, the outlines, noses, eyes, and the divisions in the hairs and beards".¹⁴ It is possible, and highly likely, that some attention would have been paid to eye detail at this point, and might be implied in an alternative interpretation of *raffermare*, as "reaffirm".¹⁵ For fresco work the main drawing is carried out with *verdaccio*, by Cennini's recipe a dark muted red or brown.¹⁶ After terre-verte underpainting, for shadows, the *verdaccio* is to be used, just as the "straight ink" was, to "crisp up" the drawing. Such procedure might be used in either of two simple systems, with flesh colour washes and some highlights then added. But a more sophisticated process is recommended by Cennini, as in the true tradition of Giotto, Taddeo and Agnolo Gaddi, and he describes more protracted and careful application of flesh colouring and highlighting.¹⁷ This process then requires the painter in finishing to:

"take a sharp miniver brush; and do the whites of the eyes with pure white, and the tip of the nose ... and touch in all such slight reliefs. Then take a little black... and with the same brush mark out the outline of the eyes over the pupils (*le luci*) of the eyes, ... Then take a little dark sinoper in a little dish; mark out under the eyes, and around the nose the eyebrows, the mouth ..."¹⁸

For panel painting the advice is to follow a similar arrangement working from an underpainting of *terre-verte* and *verdaccio*, up through the flesh tones to highlights, ending: "touch in with pure white lead any little relief more pronounced than the rest, such as there would be over the eyebrow, or on the tip of the nose, etc."¹⁹ This would be one point where some suggestion of lights for the eye might arise, but the moment passes. The treatise then continues, "outline the upper edges of the eyes with an outline of black, with a few lashes as the eye requires, ... Then take a little dark sinoper and a trace of black; and outline all the accents of nose, eyes, brows ... as I

showed you for a wall.”²⁰ There is no indication of any highlight to be placed in the iris/pupil area.

Both Theophilus and Cennini, then, leave matters of eye treatment uncomfortably vague, but they leave no real room for interpretations which could allow for a highlight anywhere near the centre of an eye.

Reflections in the eye might have been avoided in these technical texts, just as the 13th and 14th century artists seem to have done in their paintings, but there are indications in other literature of a consistent awareness of these effects. The appearance of reflected images in the pupil was considered to be an important phenomenon by early natural philosophers as they sought to develop theories of light and vision. Alcmaeon, c.490 B.C. is reported as believing that “vision is due to the gleaming — that is to say, the transparent — character of that which [in the eye] reflects the object”.²¹ Still later in the 5th century B.C. Democritus was very much aware of these images, believing these miniature but precise pictures of outside objects observable within the eye to be an integral part of the process of vision. Such theories continued to be subject to debate and the pupillary image, and its nature, were often features in subsequent discussions.²² Aristotle, a century later, has his own assessment of the nature of vision and Democritus’ theories and, while he took the view that such reflections were merely incidental, clearly his interest showed they remained a visible phenomenon worthy of comment.

Pliny, in his 1st century A.D. *Natural History* makes several references to the eye including a brief contemporary description which ends, “and the efficacy of the mirror is made so perfect by these means that the small pupil can reflect the entire image of a human being”.²³ In the late 6th early 7th century A.D. Isidore of Seville writes in his *Etymologies*, “the pupil is the middle point of the eye, and there, the power of sight

resides; they are called pupils because small images appear to us there.”²⁴ The Greek theories on vision and light were later picked up and developed by Arab scholars such as Alhazen and Avicenna in the 11th and 12th centuries. In the latter’s work we can find that he “compares sight to image formation on a mirror”.²⁵ This Arabic scholarship tradition continued in further work and commentary on Platonic and Aristotelian models and subsequently provided stimulating ideas for Western scholars, via Latin translations, from the 13th century onwards. Another of these Arab scholars was Averroës and, writing in the second half of the 12th century, he too drew intelligent attention to the mirrored images in the eye, when contemplating the nature of sight: “In the middle of these coats (ie in the centre of the eye) lies the crystalline coat (crystalline humor) which is like a mirror , partaking equally of the nature of air and the nature of water. This coat, therefore receives the forms of the air, since it is like a mirror, and it conveys them to the water (the vitreous humor).”²⁶ These Arabic writings became increasingly widely known in Latin translation in the 13th century and were profoundly influential in the 13th century Western Church and the early European universities. Two Franciscan scholars, Roger Bacon and then John Pecham, developed these concepts of vision and light during the Duecento, the latter providing among his other writings, the *Perspectiva Communis* which became the standard text for optical theory in European Universities.²⁷ Their works tended to look more towards the geometric side of matters rather than anatomy and only passing reference is made to eye reflections in these writings of the second half of the Duecento.²⁸

Thus far these comments on reflected light in the eye have appeared in works by learned scholars, not by artists. The first scholarly texts by painters did not appear until Alberti’s *De Pictura* and *Della Pittura* in 1435 and 1436, or later in the Quattrocento with Leonardo da Vinci’s scientific investigations. Alberti indicates

awareness of specular reflection in the eye in *De Pictura*, when he writes , “Nor is this the place to discuss whether vision, as it is called, resides at the juncture of the inner nerve or whether images are formed at the surface of the eye as on a living *mirror*”.²⁹

This, though, was in the more intellectual Latin version, *De Pictura*; it does *not* appear in the vernacular *Della Pittura*. It might seem then that, while he clearly observed and contemplated the reflections within the eye in terms of theory, these apparently had no particular significance in terms of actual working practice for the Italian painter, even if at this time the Flemish painters were recording them [Pls.412 & 413] On the other hand, a few decades later, when signs of highlights had appeared in works by Filippo Lippi, Botticelli and Credi, Leonardo not only explicitly recorded the nature of reflection, but made positive use of it in his investigations. He writes, “if you look into the eye of another person you will see your own image. Now imagine two lines starting from your ears and going to the ears of that image which you see in the other man’s eye: you will understand that these lines converge in such a way that they meet in a point a little way beyond your own *image mirrored in the eye*.”³⁰

There is yet another area where some indication of wider contemporary awareness of our elusive effect is to be found. Poetry of the period becomes more generally accessible through the efforts of Dante in his promotion of the vernacular. The important work in this respect is *The Divine Comedy*. In the second canto of *The Inferno*, Dante has Virgil describe Beatrice, saying, “Her eyes shone brighter than the stars”.³¹ Then Beatrice in turn talks, appropriately, of St.Lucy, telling how, “She turned away, with tears, her eyes shining”.³² Subsequently, in *Paradiso*, he specifically refers to pupils and the images in them. In one metaphor a ship is seen reflected in the eyes,³³ while in another an image of King David “shines in the middle for a pupil”.³⁴

From this trawl through surviving literature there would appear to have been every likelihood that people, at different levels, over many centuries would have been aware of reflected images in eyes, or of the sparkle which drew attention to it.

Highlights and Pupillary Images

I am aware that I might be seen to have moved rather too easily between image and highlight in seeking signs of any textual recording of what could be seen as two separate occurrences rather than one. The equation of eye lights and pupillary highlights is justified, even allowing for translation through a variety of languages, Greek, Latin, Arabic, Italian and English. These textual indications are a consistent train of appropriate symptoms of the phenomenon being tracked. The highlights are but part of the whole phenomenon of pupillary reflection. Admittedly they are the most spectacular manifestation of it and, though they can serve to draw our attention to the less obvious and darker surrounding image, of which they are part, their very brightness readily makes them register as isolated spots of light. In effect, the highlight draws attention to itself at the expense of the whole image.

The spherical mirror offered by the eye clearly shows an image. Through the basic physical properties of a convex mirror this image covers a larger angular field of acceptance, when compared with a flat plain mirror. In consequence, each element within this effectively wider reflected scene, in a subject's eye and as presented to a close observer's scrutiny, appears relatively small. In other words, as we all know from experience, the convex mirror is a reducing mirror. Besides this, the eye is not a "silvered" mirror. Its function really requires it *not* to be an efficient reflector. Ideally it ought to be completely transparent and, with a refractive index equal to that of air, would be able to accept and pass on all light incident on its surface. It would

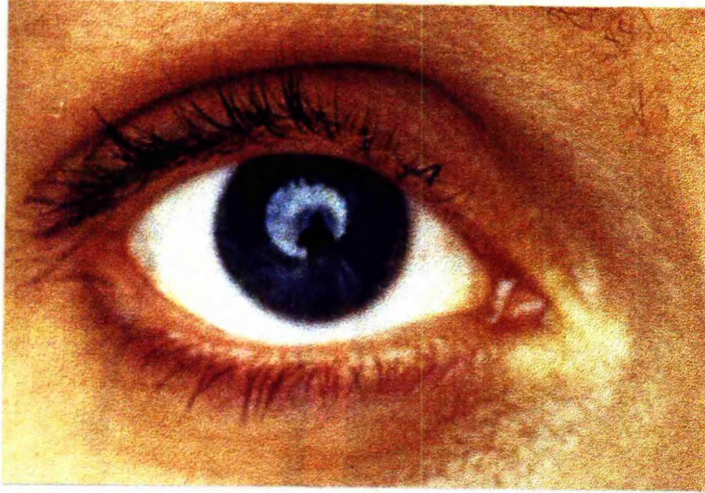


Fig. 37 : *Photograph of Eye*, Radio Times, Nov.20th-26th, 1999.

then function perfectly, allowing the free passage of all such light to provide the retina with maximum stimulation. Thus any reflected light to be seen on the eye's surfaces is, in a sense, an indication of imperfection and quite an accidental result of incident light meeting changes in refractive index as it passes from the atmosphere into, and through, different elements in the eye's make up. The surfaces of the eye are optically smooth and provide distinct images, but only a small portion of light is returned to the viewer's domain. The result, then, provides clear detailed images but these are both darker and reduced in scale. While they are there to be seen, if we approach and address them as Leonardo, or the various Greek and Arabic scholars did, we normally are not aware of the detail of these smaller and dimmer images. What does, however, come to our immediate attention are the reduced, but still significant, signs of the source, or sources, of any light illuminating the subject's face which appear as part of such images.

Perhaps we might consider two views of the eye and these reflected images. The first is the situation where attention is concentrated on the eye itself and the mirrored scene it offers. Our own observing eye, as normal, adjusts to the level of the brightness it has presented to it. Normally we contrive to look at a scene with the main illumination coming from behind us, or from the side, certainly not from behind the subject. But the miniature image, which we are considering here often includes a light source, by virtue of the wide view afforded by the convex nature of the eye. In consequence, the brightness pattern, in such a situation, is very much like a *contre jour* arrangement. Our visual system adjusts, as normal, to accommodate the strong light within our scene, thereby losing sensitivity to the darker areas around it. A photograph [Fig.37] illustrating circumstances approximating to this shows the resulting effect. The highlight is seen and the accompanying darker image detail is

rendered less obvious, just as might occur in looking at objects against an evening horizon. That is, of course, unless we positively direct attention towards such details and avoid the highlight, in the same way as we might squint, under tightened brows or a sheltering hand, at such objects closely in line with the setting sun. Van Eyck's painted mirror [Pl.415] also serves as an illustration. Though there is a whole scene reflected, and even if Van Eyck has accentuated the other details in it to allow them to register, the bright window reflection is the most pronounced element.

The second viewing situation, and a more usual one, is when we look at a complete face. In this case the eye represents just a small proportion of the viewed scene, and the pupillary images a still smaller element in that. The adjustments automatically made by our visual system are then related to the brightness patterns presented by the face. The already minute image on the pupil offers much lower levels of light and hardly registers, if at all, and only a prominent highlight makes its presence known.

There, then, is no real difficulty in looking for our highlights and equating them with, or treating them as the substantial part of, the image in the eye, for indeed they are the main pointers to its existence.

Conclusion

It is clear that there was an intelligent awareness of the reflected lights in the eye during the 13th and 14th centuries. But, nevertheless, as far as can be reasonably ascertained no highlights are depicted in the eyes of Duecento and Trecento paintings and technical texts seem to conspire in this omission. Any painted intrusion into the iris or pupil is studiously avoided. The patterns of work as reported in texts and as executed are in agreement. But it is difficult to believe, particularly in the adventurous

period of the late Duecento or early Trecento when patently spatial illusion, depth and volume were being pursued, that no intelligent artist found, by accident or design, the graphic value of these small but significant tokens of vitality. If this did occur no change was prompted and no examples of any experiments are to be found. In this particular aspect of depiction the influence of a long tradition, of a thousand years, clearly dominated. But still, the period “blindness” to these effects in pictures can be given some modern understanding if we consider that, as far as I can see, this the first time the matter has been seriously raised. This absence of painted eye-lights has been looked at and accepted, without comment, through many years of study right up to the present. Thus just as in the Trecento, even for modern eyes, it is probably just a case of seeing what we look for.

As far as the return of the eye lights in the Quattrocento is concerned their reappearance in secular portraits in the North should perhaps be seen alongside their last appearance in similar portraits in Graeco-Roman Egypt in the 3rd century. The need to give individuality to representations of ordinary humans was the important catalyst.³⁵

Chapter 4 Notes

- 1: F. Ames-Lewis, 'Fra Filippo Lippi and Flanders', *Zeitschrift für Kunstgeschichte*, 42, 1979, pp. 255-273, discusses obvious Northern influences in Filippo Lippi's work. p.270 suggests two possible avenues for this, contact with Flemish works in Padua c.1434 and a possible visit to Flanders in 1434-35, just possibly, p.271, with Cardinal Albergati [Pl.413 has been suggested as a portrait of the Cardinal though alternative opinions have it as the Bishop of Winchester], and p.272 also puts forward the possibility of Lippi travelling to Flanders as a Medici agent.
- 2: Leonardo (MacCurdy), *op.cit.*, Vol.II, p.211. "The eye, which is called the window of the soul . . ."
- 3: Oakeshott, *op.cit.*, pp.152 & 193.
- 4: *Sinai : Treasures of the Monastery*, ed. K.A. Manafis, Athens 1990, p.93.
- 5: *Ibid.*, p. 93, Contribution by G.Galavaris, McGill University.
- 6: *Ancient Faces: Mummy Portraits from Roman Egypt*, 14 March-20 July 1997. London, British Museum.
- 7: See above Chapter 2, p.125. note 25.
- 8: D.Norman, ed., *Siena, Florence and Padua*, New Haven and London, 1995. Vol.II, p.272 , note 6, major repainting of the N.E. corner of the Sala dei Nove was carried out c.1350-60, and "Further restoration is documented in 1491, 1518, 1521, 1838, 1879-80, 1951-52 and 1986 -89."
- 9: For Theophilus see above Chapter 3, p.202 note 74,
- 10: For Cennini see above Chapter 3, p.203, note 75.
- 11: Theophilus (Dodwell), *op.cit.*, Bk.I. Ch.6 , p.7.
- 12: *Ibid.*, Bk.I. Ch. 13, p.9.
- 13: Theophilus (Hawthorne & Smith) *op.cit.*, p.20, translates "oculos superius" as "the upper part of the eye."
- 14: Cennini (Thompson), *op.cit.*, Ch.XXXI, p.18.
- 15: *Ibid.* p.xiv, translates the Italian "raffermare", as "crisp up" but if the likely alternative "reaffirm" is accepted, then the implications here take us beyond mere outline and lets some solid reinforcement be made to the pupil. For Italian text, see Cennini (Tempesti), *op.cit.*, p.47.
- 16: Cennini (Thompson), *op.cit.*, Ch. LXVII, p.45, the recipe for *verdaccio* is "a bean of well ground ocher ... a little black ... a little lime white ... light cinabrese, as much as the tip of a pen knife will hold .." This makes a desaturated red, a brown in fact, as L. Coletti, *Tomaso da Modena*, Venice, 1963, p.35, points out *verdaccio* is with "ocria, nero, cinabrese , e bianco; non, dunque, un verde, ma un bruno. . ."
- 17: Cennini (Thompson), *op.cit.*, p. 45-46.
- 18: *Ibid.*, p. 47.
- 19: *Ibid.*, p.94.
- 20: *Ibid.*, p.94.
- 21: Lindberg, *op.cit.*, (*Theories of Vision*), p.4.
- 22: *Ibid.*, p.3, Democritus, "attached great significance in the act of sight to the pupillary image, that is, the image of outside objects mirrored in the cornea" while Aristotle's assessment of the phenomenon was that " the case is merely one of reflection", and these are but incidental to the process and von Fritz suggested that "this theory undoubtedly originated in the observation that we can see in a person's eye a miniature reflected picture of his visual field."(from K.von Fritz "Democritus' Theory of Vision." In *Science, Medicine, and History : Essays on*

- the Evolution of Scientific Thought and Medical Practice, Written in Honour of Charles Singer*, edited by E.A. Underwood, 1: 83-99. London, 1953, p.43).
- 23: Pliny, *op.cit.*, Bk.XI. 55. "The horny skin in the centre of the eye nature has furnished with the pupil as a window. The narrow opening of which does not allow the gaze to roam uncertain, but so to speak canalises its direction, and easily averts objects that encounter it on the way; the pupil is surrounded with circles which with some people are coloured black, with others grey and others blue, so that the light from the surrounding radiance both may be received in a suitable blend and having its reflection moderated may not be jarring; the efficacy of the mirror is made so perfect by these means that the small pupil can reflect the entire image of a human being."
 - 24: Isidore of Seville, *Isidori Hispalensis Episcopi Etymologiarum sive Originum Libri XX*, ed. W.M. Lindsay, 2 vols, Oxford 1911, XI. 37. "Pupilla est medius punctis oculi, in quo vis est videndi; ubi quia parvae imagines nobis videntur, propterea pupillae appellantur."
 - 25: Lindberg, *op.cit. (Theories of Vision)*, p.49 quotes Avicenna: "the eye is like a mirror, and the visible object is like the thing reflected in the mirror by the mediation of air or another transparent body and when light falls on the visible object, it projects the image of the object on to the eye....If a mirror should possess a soul, it would see the image that is formed on it" (from Avicenna [Ibn Sina], *Le Livre de Science*, trans. Mohammad Achena and Henri Massé, 2 vols., Paris. 1955-58, vol 2 p.60).
 - 26: *Ibid.*, p.55, Quotes Averroës: "In the middle of these coats [ie in the centre of the eye] lies the crystalline coat [crystalline humor] which is like a mirror, partaking equally of the nature of air and the nature of water. This coat, therefore receives the forms of the air, since it is like a mirror, and it conveys them to the water [the vitreous humor]. (from Averroës [Ibn Rushd] *Epitome of Parva naturalia*, trans. H. Blumberg, Cambridge, Mass., 1961).
 - 27: Lindberg, *op.cit. (Perspectiva Communis)*, p.29.
 - 28: Lindberg, *Roger Bacon and the Origins of Perspectiva in the Middle Ages*, Oxford, 1996, p.39-40.
 - 29: Alberti (Spencer), *op.cit.*, p.47.
 - 30: Leonardo (MacCurdy) *op.cit.*, Vol. II, p.371.
 - 31: Dante, *op.cit.*, Inferno, Canto II, line 55. A medieval understanding of the derivation of Lucy's name was that it came from *lux*, Jacobus de Voragine, *op.cit.* Vol.I, p.27.
 - 32: *Ibid.*, Inferno, Canto II, line 116.
 - 33: *Ibid.*, Paradiso, Canto XVII, lines 41-42. "...come dal viso in che si specchia / nave che per corrente giù scende."
 - 34: *Ibid.*, Paradiso, Canto XX, line 37. "Colui che luce in mezzo per pupilla." The implication is of the *image* of King David in the pupil, just as Isidore describes the pupil, see note 24 above, and perhaps shining "through" or "from" would be a happier translation than the "for" which Sinclair elects here. But the line is subject to differing translations. M.Musa's interpretation, *Dante's Paradise*, trans. M Musa, Bloomington, 1984, p.237, is, "He at the centre as the pupil's spark . . .". Alternatively in T.W.Ramsey, *Il Paradiso di Dante, An English Version*, Aldington, 1952, p.87, the rendering is "He who from pupil of the eye shines down."
 - 35: Suggested by Brendan Cassidy, St Andrews University.

CHAPTER 5

CLOTHING, FABRICS AND MATERIALS

The painters' approaches to faces and figures might be seen to be restrained by self imposed disciplines or new conventions. But their immediate surroundings, garments and furnishings, are subject to a freer handling. Less inhibited treatments of these allow them to make more positive contributions to overall pictorial space. They offer a context with a more expansive sense of volume and depth in which to accommodate the restricted faces and features.

Such items could be treated separately from the faces. They were discrete component forms, distinctly separate elements contributing to the composition, but individually determined within their own outlines. Such autonomy let separate developments take place. Sometimes this was in the direction of more accurately representing naturalistic lighting effects, while other developments were purely stylistic. This diversity in developments and approaches has been noted not only between faces and clothing, furnishing fabrics and materials but also between the different categories of items themselves. Thus P.Hills in comparing the St.Francis Altarpiece in S.Croce's Bardi Chapel and Pietro Lorenzetti's *Birth of the Virgin*, of a century later, could note, "a certain uniformity of modelling in thirteenth-century painting — towers, draperies, rocks are all striped light and dark — whereas in the fourteenth-century altarpiece, costume is modelled in one fashion, the bedspread in another, water jugs in another and so on. The identity of things is now distinct and the contrast between the patterned and the plain is not blurred by the imposition of strong modelling."¹

The different items, clothing and furnishing fabrics together with associated objects and materials, can be looked at separately, although any signs of progress towards the interaction between them, or of moves to some common approach, is worthy of note as indicating a step towards integration within a more sophisticated and evolving visual language of naturalistic depiction.

One major area of influence reflected in Italian 13th century painting was that of Byzantine images, both mosaic and painting. In these a distinct priority is discernible, for in Byzantine painting a recurring pattern of differential handling is noticeable. A much higher degree of attention was paid to the modelling of faces than other items, including the drapery of robes². The often sophisticated execution of face and flesh, with subtle gradations of tone is in contrast to a coarser procedure with flat unblended areas of superimposed tone and simple lines used for garments. The balance here is one which is redressed by Italian 13th century developments and one sign of evolution, and the independence of Western art from Byzantine, is the degree of attention paid to the depiction of fabric.

A further factor, colour, makes the perusal of the depiction of fabrics particularly informative. The exploration of colour in the pursuit of light and shade effects is best seen in fabrics. European faces, and naturally these are in the main most of those depicted by 13th and 14th century Italian painters, are essentially comprised of a small range of hues, specifically pinks and browns. Architecture similarly has its own restricted palette. Apart from some occasional pastel shades its masonry remains mainly neutral. The period's rudimentary landscapes have neutral stone colours for standard rocky backgrounds and only limited greenery. The materials of robes and furnishings and their colours then offered the only real scope for adventures in the use of the various pigments available.



Fig. 38 : Fresco Palimpsest, Trecento and Romanesque frescoes.
Verona, San Zeno.

One important change in technique aided control of representations of light and shade in picture making. Artists turned from a dependence on line and decorative pattern to a painterly technique. Here the change to soft transitions of colours and tones already seen in painting faces in the late Duecento is still more obvious in fabrics. In moving towards the semblance of a naturalistic depiction of garments the subtleties of any play of light or the rise and fall of fabric could more readily be satisfied. The softer, more fluid, technique which came from the blending of passages of colour, either by mixture on the fresco surface or from fine hatching in tempera work, is noticeably different from the linear effects or ungraded overlaying of flat planes of tone which in the main appeared in earlier images. A piece of the nave wall of San Zeno Verona [Fig.38] is an interesting palimpsest in this respect. Damage to a Trecento fresco has revealed an earlier, Romanesque, set of figures beneath. The close juxtaposition of the softly modelled garment in the first and the emphatically linear treatment of the latter makes the difference between the two approaches abundantly clear. Similarly other comparisons can be made between earlier Byzantine images and the evolving 13th and 14th century Italian techniques. D.C. Winfield, in comparing the techniques of Byzantine traditions and Italian painters of this period, suggests that the former's tendency to offer discrete areas of colours and tones explained the "predominantly linear appearance of Byzantine paintings".³ This was seen at closer historical perspective by Vasari, in the 16th century, when he notes, on commenting on a Cimabue fresco, that he had "swept away that ancient manner making the draperies, the vestments, and everything else in this work, a little more lively and more natural and softer than the manner of the Greeks, all full of lines and profiles both in mosaic and in painting."⁴ Certainly it is apparent in Cimabue's and his late Duecento colleagues' paintings that the brush played an important part in the soft

blending of tones. This, and a finely graded selection of these tones and colour allowed for a more subtle following of variations of light to give an increasing sense of the rise and fall of the fabric and its folds.

Just as for faces a noticeable development, or rather redevelopment, of something approaching naturalistic modelling for drapery reached a stable, and it would appear a generally acceptable, standard by the end of the Duecento and beginning of the Trecento. By the opening years of the 14th century a fairly standard set of approaches to the painterly depiction of clothing had been established and continued through the Trecento in both fresco and tempera working. A consensus in approach applied, or, if looked at in another way, one might see this as a return to the following of standard models, albeit new ones, after a period of adventurous innovation. Thus another set of conventions specific to the natures of fabric and materials was established. The elements of the procedures involved are in large measure reported in Cennino Cennini's *Il Libro dell'Arte* as being those of Giotto and his followers but are effectively common to other painters of the period.⁵

Antecedents, Recent and Ancient

Broad comparisons have been made between the developing 13th and 14th pictorial techniques and the preceding Romanesque and Byzantine ones to underline the different direction in which the later workers were moving. But there was not an abrupt spontaneous change. Developments were evolutionary rather than revolutionary and there was some variety, conservative and progressive, in the works of the immediate past. There were also a number of survivals from earlier times which might have given the Duecento cause for thought and if we see these as offering a range of

ideas we will find, as in other areas, that painters were not so much inventing as rediscovering and redeveloping techniques explored in the past.

While early painting was largely lost some mosaics survived. In Rome Constantine's basilica of St Peter's had 4th century apse mosaics with illusionistic treatments [Pl.43], and Sta.Pudenziana's early 5th century apse mosaics [Pl.46] showed naturalistically draped Christ and Apostles.⁶ Later survivals, the 6th century mosaics in SS. Cosma e Damiano, [Pls.54 & 55] demonstrate some transition towards a simplification of depiction and more formal stylised approach. Here some drapery with softly graded shading naturalistically simulating fabric is seen alongside the central Christ in golden robes with folds patently arranged for effective pattern, with a linear discipline, rather than as representing the natural fall of cloth. Near contemporary, c.547, representations of Justinian and Theodora's courts in S.Vitale Ravenna [Pl.58], show moves in the same direction in Byzantine working. Here the formal presentation of rich and sumptuous garments, in accentuating the sense of court and ecclesiastical ceremonial, turns away from illusionistic treatments. Robes and their folds are pressed into generalised patterns, illustrating tendencies towards a more schematic and flatter depiction of clothed figures. Still later early 9th century examples in the apses of Sta.Cecilia in Trastevere, Sta.Maria in Domnica or Sta.Prassede, [Pl.67], show the dematerialised figures at the end of the stylistic drift or evolution, which, over the 7th and 8th centuries, moved intermittently, but definitely, towards a two-dimensional generalisation leaving robes as planar elements, defined by line and flat colour.⁷

Painting and manuscript illumination, perhaps with less decorative and more narrative demands on them, retained some semblance of naturalism for a little longer than mosaics. Nonetheless, these too tended towards abstraction in linearity and

significant pattern. C.R. Dodwell comments that “Painting during in our period (800-1200) seems to progress by fits and starts, but the abstract remains its goal”.⁸

Romanesque painting and illumination found the nature of folded fabric transcribed into ornamental forms with deliberate definition by firm lines. The lines themselves became part of the decoration and were even employed as calligraphic elements, enjoyed for themselves, as well as functioning as contours and outlines. Such linear forms were obvious abstractions from Byzantine models which still set the general standards for picture making, even after the two iconoclastic interludes.⁹ These Eastern images, after the trauma of iconoclasm were, certainly for public works, somewhat restricted and carefully conservative. These were themselves stylised, even though recurring examples of reflections of Hellenistic art and traits appeared to tell of the availability of ancient naturalistically painted models and the expertise to emulate these. For example the 9th century Vatican Gregory or the Paris Psalter [Pl.104], of the 10th century, are later examples, while the c.800 Coronation Gospels, [Pl.101], courtesy of Greek or Greek trained artists, had provided the Carolingian court painters with Hellenistic exemplars.¹⁰ The Western responses to the subtleties of such resurrections, whether drawn or painted, were always transcriptions into predictable patterns defined by lines. Lines and forms were organised into significant and appealing shapes and arrays which might readily be repeated. A formulaic repetition and decorative intent were then major factors. Thus a balance between decorative aims and simple clear and consistent illustration is what largely comes to characterise both Romanesque and Byzantine depictions of garments in the two centuries before the changes we see gathering pace in the mid-13th century.

Nonetheless, a slow return to some sense of volume and hints at realistic depiction becomes apparent at the beginning in the 12th century. Early hints appear

then in Byzantine mosaic works, though it was not until later in the century that some signs appear in Italy with mosaics in Venice or in Sicily. The examples of metropolitan art from Constantinople from this period which have survived are few and rather fragmentary. They offer little narrative content being mainly hieratic, with gesture and mien somewhat restrained, though even here there is some hints of an appreciation of the humanity of sacred figures, expressed in a softening of the depiction of both their faces and their garments. Fortunately a few survivals from provincial centres can offer some suggestion of those pictorial intentions which are likely to have featured in other prestigious commissions. These offer narratives with increasing sign of sympathetic human expression and with this some general softening of the linear and geometric makeup is apparent. Some of the c.1100 mosaics at Daphni [Pl.76] show this clearly, though some fifty years earlier those at Nea Moni, Chios, might be seen as anticipating the changes. The Daphni mosaics demonstrate artists' interest in the organic nature of drapery, in that lines are more fluid. Additionally the use of mid tones helps illustrate, in simplified light and shade, the undulation of fabric in garments and their disclosure of the figure and limbs beneath. But there are also continuing signs of formal pattern-making. A highly decorative, non-naturalistic and linear use of gold striations was employed to suggest stylised folds on the garments of the Risen Christ. This artifice, *chrysography*, will be addressed separately later (p.265 ff. below). The need for pattern was satisfied in other ways with the realisation of elegant curvilinear forms rather than sharply rectilinear and mechanical shapes. This was further expressed in the picking out, in sinuous lines, of those signs of bodily curvature beneath the garments. Examples of this had been available from earlier manuscript works. The Homilies of St. Gregory Nazianzus [Pl.103] of the late 9th century or the Paris Psalter [Pl.104] of the mid to late 10th century, both with obvious

dependence on antique models, are cases in point. The treatment here clearly derived from the clinging style of drapery used effectively in classical sculpture as early as the fifth century B.C. [Pl.29], and became, still later, a quite distinct affectation, with its most pronounced effects sometimes given the term “damp-fold”.¹¹ This device also suited the linear inclinations of Romanesque painting and its manifestation in the West was emphatically geometric. A developed version of the affectation, a compromise between pattern and modelling, finds its way into Italy in the late 12th century mosaics of Venice’s San Marco and Torcello’s Sta.Maria Assunta [Pl.92].

This liberalisation of painted drapery in the direction of more realistic modelling is also seen in some 12th century Balkan frescoes. The frescoes at Nerezi of 1164, provincial but commissioned by members of the Imperial Comneni family, are expressively handled both in facial terms and in the flowing lines of the figures’ garments.¹² The painting techniques are in transition here. Some sections [Pl.115] still rely on a series of separate broad areas, or narrow lines, of colour with some occasional overlaying of these to provide modelling. Their lines and shapes are smoothly fluid, but are still lines, and the blocks of colour are sharply differentiated. However, other frescoes [Pl.116], do show signs, not just of overlapping, but of a subtle building of colours in layers to approach a softer modelling. Still further developments in a painterly direction are also to be seen in this Balkan area. In the c.1235 murals at Milesevo or, more impressively those at Sopoćani’s Church of the Trinity, c.1265, softly blended colours and tones now model fabrics effectively. The smooth blending of tones for the Apostles in the *Dormition of the Virgin* [Pl.118], gives every suggestion of the nature of the robes’ material while conferring a monumental gravity on these figures. If no direct connection has yet been made between artists, and/or their pictures in the Balkans with those in Rome in the 1260-80 period, or still

later in the century for that matter, similar approaches are indicative of at least some common thinking if not common models. It is also around this time, c.1260-70, that early signs of a similar turn to softer working appear in Italy to herald moves towards the more realistic portrayal of clothing and the effects of light shade. Margaritone in the 1260s shows, in two different representations of St Francis [Pls.134 & 135] alternative treatments of the saint's habit. One still carries obsolescent damp-fold stylisation, where the cloth clings tightly to the right leg and its folds are pressed into a contrived pattern of highlights defined in hard linear terms. The second shows a gentler approach with the indications of the underlying limbs more quietly stated and the softer lines of folds suggesting something closer to a yielding but heavier fabric. The new technique, with less reliance on lines, required a higher level of attention being paid to details of light and shade to ensure that a realistic effect was achieved while still preserving the more subtle evidence of underlying limbs and body.

The move to the softer depiction of fabric continued in Rome. In the *Sancta Sanctorum*, the frescoes of 1277-80 show a mixed set of painting strategies from at least four different masters.¹³ This healthy diversity illustrates both the vigour of painting in late Duecento Rome and the promise of new approaches in picture making. The main votive section, with the Pope and Saints Peter and Paul [Pl.145] shows substantial drapery falling in folds which are clearly painted rather than drawn, though a certain amount of sharpness is still discernible in some folds and a modicum of extra highlight emphasis is given the knee and thighs of the Saints. Christ alongside has his robe very softly treated though his tunic has some sharply defined folds, perhaps a conscious appreciation of different weights of material [Pl.147]. Elsewhere the fresco of *St Stephen's Martyrdom* [Pl.156] shows considerable recourse to stylised limb hugging techniques, though with soft folds, while, in the *Miracles of St Nicholas*, the

garments are freely depicted [Pl.157]. The main robes free of any undue affectation which might have tended to over emphasis any sense of underlying limbs.

For all that the varied Sancta Sanctorum works differ one from the other, they are all dramatically different from Roman works of just a few decades earlier. The c.1246 murals in the St.Sylvester Oratory of Santi Quattro Coronati, for example, or those of Anagni, c.1255, display a hard linearity rather than the newly developing painterly approach. Anagni's *Elders of the Apocalypse* [Pl.130] exhibits the affectation of linearly determined ornament and a geometricised version of "damp-fold" fabric. In the St.Sylvester Oratory of Santi Quattro Coronati the murals [Pl.128] have some signs of graduated shading on facial highlights but are emphatically linear in their depiction of folds. These paintings show signs of influence from mosaic works, in particular from those of Monreale, c.1180-90, with the borrowings clearly being expressed in elements of simple form and line.¹⁴ This again takes the line of influence back to Byzantine work, this time via 12th century Sicily, where its Norman rulers, in aspiring to Imperial grandeur, imported Greek workers.

Another source of possible late antique influence in Rome was that of the 5th century frescoes in the nave of S. Paolo fuori le Mura. These were repainted in part by Cavallini, between 1278 and 1290.¹⁵ It is assumed he gained some benefit in light and shade treatments from these but this can be only conjecture as the few untouched originals and those updated ones by Cavallini were destroyed by fire in 1823. Seventeenth-century water-colour copies show some indications of modelling and shading.¹⁶ While these can hardly be counted as positive proof of painterly activity, the absence of any over-dependence on line in pattern making, together with the minimal reporting of lines and with these economically suggesting fluid and soft arrangements of fabric, the likelihood is that the sense of the fall of material was given

by the brush rather than line. The faithfulness of transcriptions is, of course, debatable, but comparisons with other similar contemporary projects allow for some confidence in their reliability. For instance, the Barberini sketches of Cavallini's mosaics in Sta. Maria in Trastevere show how closely the original could be followed. [Pls.177 & 178] Nonetheless, whether Cavallini was or was not schooled in the softer handling of fabrics by S. Paolo fuori le Mura's frescoes his painterly treatment of fabrics in the Sta. Cecilia in Trastevere *Last Judgement* frescoes, c.1290s [Pl.182] totally rejected the linear and patterned stylisations of other earlier Duecento Roman works like the SS. Quattro Coronati or Anagni murals mentioned above and had progressed beyond the level of expertise in the Sancta Sanctorum frescoes. Importantly, one obvious result of this was a new ability to follow, in a plastic way, the perceived response of the effects of the fall of light on garments. The now continuous gradation of dark and light tones allowed of a convincing image of textured wool which naturally enclosed a real body, with suggestions of not just volume in itself but a positive location in a believable illuminated space.

Up to the 13th century, mosaic, as the prestigious and expensive medium of choice for major church decoration, had set the standard for image making. Its linear and decorative influence on painting is patently obvious in the first half of the century. Progressively from mid century onwards Italian mural painting developed independently, and mosaic lost its prime position by the beginning of the Trecento. Painting, now free and innovative, could and did dictate to the more expensive medium rather than passively accept and ape its working practices. Perhaps one might see this as a return to circumstances of antiquity where illusionistic painting clearly had more precedence, and mosaics strove, as in the *Alexander Mosaic* or Dioscurides' *Street Musicians* [Pl.31], to reproduce its effects. The changing balance is apparent if

we compare two late projects from the closing decade of the Duecento, Torriti's Sta. Maria Maggiore apse [Pl.165] and Cavallini's *Life of The Virgin* cycle in Sta. Maria in Trastevere. [Pl.177]. The Torriti mosaics conservatively stay close to older precedents with multiple sharp and linearly defined folds articulating the robes. There is too some obvious recourse to a sense of limbs and joints being moulded through the garments, perhaps quietly so for ^tThe Virgin, somewhat more emphatically for Christ and very obviously in the case of attendant Saints Peter and Paul. The *Life of the Virgin* sections on the drum below, particularly *The Dormition*, [Pl.169], exhibit a very pronounced dependence on line for drapery depiction. In comparison, Cavallini across the city in Trastevere was transparently intent on rendering his mosaics in a naturalistic way which equated with his painted images. There is some considerable debate as to whether the Sta.Cecilia frecoes were painted before or after the Sta.Maria mosaics.¹⁷ Nevertheless, the clear similarities between the two serve to illustrate the degree to which Cavallini in the last decade of the Duecento confidently translated his developed painterly skills into mosaic and adventurously made the tesserae follow the brush. The actuality of a cloth of substance, with weight of its own, hanging naturally, is sought and the fluid execution of the brush is mimicked. In consequence, the enlivening play of light on fabric is displayed. The over-stated multiplicity of folds and undulations of fabric is reduced and abrupt contrasts between the prominences and adjacent troughs of folds are not so sharply made as in Torriti's scheme. Indeed, attempts to soften some transitions via optical mixing are, in places, unfortunately too obvious, as the ragging of red tesserae in Simeon's robe in the *Presentation* [Pl.179] readily shows. These reflections of painting in the mosaic of Cavallini's *oeuvre* are quite distinctive. On the other hand, for Torriti some influence still runs from mosaic to painting. The sharp edges of mosaic "work-lines" are echoed in quite brittle prismatic folds on robes

painted by him or his workshop in the transepts of Sta. Maria Maggiore [Pl.170], and such crispness appears also in the higher register of St Francesco Assisi, Upper Church, along with overtly affected touches of body modelling through clinging fabrics [Pl.164]. Cavallini shows that the body and limbs modify the garment, but does not allow them to dictate any undue emphasis. While the freely modelled robes of figures like those in the Sta. Cecilia in Trastevere frescoes, with their soft transitions, cannot too easily be followed in the less tractable medium of mosaic, Cavallini's work in Sta. Maria in Trastevere showed a commendable essay in this respect. Indeed it is clear, as J White notes, that it is a painter, and one conscious of lighting effects, rather than a mosaicist who is in direct control of the project.¹⁸ With regard to such expertise it ought to be noted in the Torriti mosaics that, while the robes are conservatively, almost linearly, stylised the faces are carefully modelled with such fine gradations that there is little sign of facture — "work lines" are virtually invisible.

The change from mosaic to fresco is triumphantly demonstrated at Assisi with the adornment of S. Francesco Upper Church in the closing decades of the Duecento and with further projects in the opening decades of the Trecento carried on in the Lower Church. The progression towards painterly execution and with it a freer following of light and shade can be charted from the early Lower Church murals by the Master of St Francis, [Pl.136] completed before 1265, through into the Upper Church [Pl.195] and then back to the Lower Church.¹⁹ Here works of the first two decades of the Trecento, the Giotto workshop north transept and the Lorenzetti south transept frescoes, then the Simone Martini St. Martin chapel are all adjacent to the earlier painting and so allow close comparison. The earlier paintings show flatly laid out garments, with fabric and folds presented as lines, and with very limited tonal modelling. The St. Martin Chapel's draperies, in contrast, have little use for such line

and all garments' folds are softly made with the brush [Pl.340]. But then, even in the mid-Duecento the Master of St Francis himself was evidently working during an evolutionary period. Comparisons between his c.1260 frescoes and some of the panels of a now dismembered altarpiece of his, painted about a decade later, can show movement towards more painterly execution and with it increasing ability to represent light and shade [Pl.137].²⁰

Trecento Practices

With both Cennino Cennini's *Il Libro dell'Arte* and 14th century paintings we can look at both "workshop-theory" and practice in the Trecento depiction of drapes and robes. Other relevant texts surviving from earlier times, Theophilus' *De Diversis Artibus*, c.1110-40, the *Lucca Manuscript*, late 8th or early 9th century, the *Mappae Clavicula*, 8th or 9th century, and *Eraclius, De coloribus et artibus Romanorum*, 10th century, might reflect older Romanesque usage and help gauge the transitions involved.²¹ Documentation of Byzantine working is not available, but its procedures would seem to correspond with those of Theophilus and the earlier texts, and in part with those of Cennini. There are signs that all these texts exhibit a reliance on common Byzantine origins.²²

The developed painterly approach as seen in murals and panels, where the brush is given a more important role than merely providing flat washes or planes of pigment, is clearly paralleled in Cennini's text. Though he was at pains to stress the importance of line, careful drawing being still involved for preliminary laying out of drapery, he advises, "do not have your drawing show too much, but moderately."²³ He makes much of blending tones and colour transitions on the wall or panel. The various prepared pigments were kept distinct and pure, or carefully combined in mixing bowls,

but when required together in modelling a passage of fresco he counsels “blend them and work them well in together”.²⁴ For tempera panel work he advises “blending them skilfully, softening delicately”.²⁵ The earlier texts, on the other hand, all imply, a provision of tones with no expectation that transitions between these would be other than abrupt. Blending is not suggested and those examples we have show discrete areas of tone and colour superimposed in Romanesque or Byzantine depictions of clothing with little signs of graduated transitions. The one isolated mention of any procedure which can be interpreted as blending is Theophilus’ instructions, in Chapter VI, not for garments but in painting the white of the eye. Here the transition between applications of grey and white should be softened as he instructs with a wash of water.²⁶ He does recommend some hatching, in painting faces, in chapters VIII and IX.²⁷ These, however, are not to bridge between different areas but, made over existing tones of the same colour, are just local modifications to these. In any case, even if these operations might be taken to indicate some softening of edges, they apply to faces or flesh and, in contrast, there is no suggestion of blending to soften the transition adjacent areas of divergent tones in the Chapters on fabrics, and only at one point is some light toned hatching recommended for local highlighting of fabric.²⁸ Byzantine wall painting technique did not mix paint in the picture surface and the result of such avoidance of any soft merging, the overlaying of cleanly edged passages, together with the drawing in of folds, produced a linearly patterned image with discrete sectors of tone.²⁹

Another aspect of the system outlined by Cennini is consistent with this soft blending. There is a very controlled use of colour centred on the selected local colour of the garment or drapery. Different admixtures of white modify this base to give a range of tones which is offered as some semblance of the play of light on the material.

The gamut of tones resulting was graded in tonal value and saturation from the basic unaltered colour to a final desaturated white. “Saturation modelling” could be an appropriate term, but since the operation added lightness to the basic unmodified colour, the term “up modelling” is often applied to this. A later, and fuller ranging, modelling, subsequently incorporated into Alberti’s preferred working in the mid 1400’s, has been termed “down modelling”.³⁰ Here the basic colour is used centrally on the figure, and, while lighter and desaturated tones of this colour are then graded on the lit side, just as in Cennini’s procedures, the darker side is controlled by additions of black or other dark neutral hues and tends towards the monochromatic. Though painters in the 14th century, tended to favour pure and brilliant colours and generally avoided the loss of vibrancy resulting from muddy mixtures, there was some resort to the addition of blacks and darker neutral colours. Duccio in the National Gallery *Madonna and Child with Saints* [Pl.274] models Mary’s ultramarine mantle with black, and Ugolino di Nerio, for many of the robes on the Santa Croce Altarpiece [Pl.301] models with dark neutral mixes. Note that even here we are looking at desaturation in the dark notes, since the admixture of neutral colours is diluting the purity of the chosen colour.

The standard, but essentially arbitrary, Cennini approach effectively means that the modelling was carried out not with any strict accuracy as to how the eye sees colour but as an approximation to a credible distribution of tones consistent with the fall of light. In effect the tonal variations produce modelling. Colour is an additional separate factor. This is not at all inconsistent with the concepts of the division between *disegno* and *colore* in later argument. Interestingly, too, modern understandings of human perception now suggest our visual system gives some priority to the assessment of tonal variations, particularly with regard to the appreciation of fine detail, edges and sharp

differentiation of form. Both colour television and four colour printing take advantage of this, using black and white contrast for sharp detailing allowing the colour elements to be treated less stringently.³¹

Purity of hue was prized and consciously preserved.³² Indeed colour is often seen to be an autonomous element in 13th and 14th century painting, with J. Shearman suggesting there was a form of controlled colour composition which he called *isochromatism*.³³ In this the arrangement of the individual blocks of colour comprising the garments are balanced for effect within the picture. They might be organised to give a bi-lateral symmetry as in Cimabue's *Sta. Trinita Madonna* [Pl.160], where the attendant angels' robes mirror one another on each side of the throne. But, on the other hand, they might be arranged to offer a more dynamic pattern, as in Duccio's *Rucellai Madonna*, [Pl.270] where a similar array of angels alternate their colourings on either side. This ornamental system of colour usage is dependent on another aspect of colour working, also discerned by J. Shearman. This termed he termed *absolute colour*. Here each separate form is an autonomous enclave independent in terms of hue. It retains its selected colour, which then is modified only by neutral additions to give tonal variations.³⁴ There is no recognition of accidental cross colour effects, which might be caused by reflections from adjacent coloured objects, nor any shadowing between them. As it happens such colour concepts are particularly important in any examination of depiction of garments since, as already pointed out, these make up much of the variable, and hence creative, colour content in Duecento and Trecento painting. The separate treatment of individual areas of clothing and drapery, independent of each other, and in some respects independent of the figures they clothed, is a distinct factor in the period's painting. A further implication of this self imposed restriction was that, with the variations in colour's saturation and tone

contained within each area, any suggested rise and fall or play of light and shade is also restricted to that form. Any aspirations towards a sense of depth are thus similarly localised.

Cangiante Effects

The preference for untarnished colours was a valued and essential contribution to the aesthetic value of a painting. While for faces there was some necessary blending to get the subtleties of flesh colouring, the duller results of the intermixture of pigments was generally avoided for garments so that these were, certainly for the central figures, generally kept brilliantly clear. However, the choice of attractive pigments was limited and one way to provide an extended range was a judicious shift of colour in modelling. This offered the appearance of shot silk, termed *cangiante*, where the fabric's apparent colour alters with varying angles of light or view point. Besides the shift in hue offering attractive variations, the various colours have their own intrinsic tonal value. Reds and blues we perceive as having a lower tonal value than greens and yellows (see Chapter 1 p.55-56 above). So this practice further extends the range of modelling available by adding colour contrast to tonal gradations. Nonetheless, if one judges by results, seemingly the artifice was employed more often for appealing, or dramatic, colour effects than extended modelling. Cennini certainly makes no claims for its value in tonal modelling, being content to point to its ornamental attractions.³⁵ The spectacular red shading on green mantles in Giotto's Arena *Lamentation* [Pl.234] illustrates the dramatic use of such effects and the restrained red/greens of the *Allegory of Poverty* [Pl.245] on the vaults of the Assisi Lower Church crossing show it subtly employed. Later in the Trecento we can find Altichiero employing it effectively to give a glamorous touch to rich robes in the Padua S.Giorgio Oratory frescoes. Here a green

garment can have golden-yellow highlights with blue shading in its folds [Pl.367], while another, again with green and yellow for the upper tones, has its lower notes descending into red [Pl.366]. His contemporary Giusto de'Menabuoi, however, taking a more extravagant line in the Padua Duomo Baptistery frescoes, provides a rather spectacular green-blue transition through white in *The Presentation of the Virgin* [Pl.382] and a garish example of a green-red colour shift in *The Calling of St Matthew* [Pl.379].

In the main the rather unnatural appearance of *cangiante* effects were hardly consistent with the quasi-illusionistic aims of the rest of Cennini's scheme of drapery depiction and it is noticeable that he does suggest, in his first description of the technique, that it could be considered for angels' clothing.³⁶ By the time he was writing, the turn of the 15th century, overt usage was becoming rarer. Some rather arbitrary and uncomplicated use continued into the Quattrocento century mainly for the indication of the supernatural, with angels robes in Lorenzo Monaco or Fra Angelico's paintings [Pl.411] providing suitable examples. Still later the seductive beauty of shot silk effects tempted artists to employ it in subtler but still non-naturalistic ways on into the 16th century.³⁷

Cangiantismo in Trecento painting has been suggested as an invention of Giotto's, but, while he certainly made full use of it, it has an earlier history in the East and Otto Demus points to its Byzantine use and probable Hellenistic origins.³⁸ A mid-Duecento panel in Assisi, *St Francis and Four Posthumous Miracles* [Pl.127], possibly by a Greek master, but certainly with Byzantine touches, makes use of colour changes. These are particularly obvious in the adding of red shading to mauve-blue garments. However, earlier techniques, both documented, and as painted, show that colour variation in modelling was an old established procedure. P.Hills, looking at

circumstances where white was not used as the lightest tone, conveniently abstracted a summary from pre-Cennini texts showing the various local colours used for garments, and the range of recommended darker and lighter, modelling pigments appropriate for these.³⁹ Here, for example, reds could find highlighting in blues or yellows and shading in blacks or blues, while green materials might shade into blues but be high-lit with yellow. Noticeably yellow pigments, ochre and orpiment, which readily become sullied with any admixture of black, are often teamed with vermilion to give a rich combination of hue as well as the distinct tonal step between the inherently darker vermilion and the higher value yellow.

Directional Lighting Effects

An apparent directional bias appears in Cennini's instructions for the depiction of robes. For fresco drapery, he requests that you ought not to take the darkest shading "past the middle thickness of your figure".⁴⁰ In *secco* work on walls in the following next chapter he doesn't specifically mention this, but indicates that his fresco instructions are to be followed here too.⁴¹ Also a few chapters later he returns to this idea. When writing of drapery with shot or *cangiante* effects (see above), he implies darker and lighter ground tones on different sides of the figure. He advises, "lay in the drapery in two values of flesh color, one darker and one lighter, blending them well at the middle of the figure. Then, on the *dark side* shade the darks with ultramarine blue; and shade terre-verte on the lighter flesh color."⁴² For panel work he looks for the deeper tones to be placed on the darker side of the subject, "*opposite* the light part of the figure" continuing "then take the light color, and lay in the reliefs and the backs of the light part of the figure."⁴³ The Thompson translation seems vaguely off target in this and I have used my own interpretation here of "*inverso il lume della figura*".

Followed to the letter, Cennini's code implies a quite oblique angle of incident light and clearly results in a substantial sense of volume and weight for the garment and of course the figure it covers. It most certainly requires an awareness of the direction of the illumination as he recommended early in his treatise.⁴⁴ However, it is clear from actual Trecento painting that such oblique angles were not those universally produced, even if generally there is some obvious awareness of a directional sense in many works. Instances of a noticeable semblance of oblique illumination effects on robes do appear to some extent in narratives, particularly in the late Duecento and early Trecento. For example, it is evident in the narrative panels of Duccio's *Maestà* [Pl.293], in Giotto's *Arena Chapel* [Pl.228], in many sections of the late Duecento Assisi Upper Church *Life of St Francis Cycle* [Pl.206] and it is a particularly noticeable feature in Cavallini's *Last Judgement* [Pl.182]. It does not, however, have any consistent place in the various Giottesque sets of frescoes produced for the north transept of the Assisi Lower Church within a decade of the Arena Chapel.⁴⁵ The effects produced there are variable, with different hands and two or three workshops involved, but generally suggest near-frontal or just off-frontal illumination. It should be noted that some indecision or lack of cohesion is apparent with confused signals from garment, facial and building modelling. Amongst other examples of variability here, *Christ's Dispute with the Doctors* [Pl.242] has faces and robes pictured as lit slightly from the right but with the temple interior clearly illuminated straight frontally. At the same time, some signs of consciously controlled organisation do appear in individual pictures. There is, for instance, a contrived and balanced lighting distribution within the overall composition of the *Massacre of the Innocents* [Pl.239]. This has the figures and buildings on the left side lit from the right and those on the right lit from the left. Centrally in this the two main soldiers, in a pivotal position,

have garments showing a more frontal treatment compared with the more obliquely depicted robes to their left and right. This random set of variations might be diverse experiments or then again perhaps arose through lack of imposed direction in a Lower Church with little natural light. In contrast, Pietro Lorenzetti's frescoes in the south transept of the Lower Church, painted still a few years later, c.1317-20,⁴⁶ while they too did not follow any existing lighting, had a consistent, left to right, scheme of lighting orientation. Thus, with the pictures distributed on both east and west sides of the vaulting, the direction, relative to the church, changes through 180° [Pls.302 & 303]. Twelve out of the thirteen sections of fresco spread over vaults and wall are lit to this pattern, only the *Last Supper* with its own particular lighting agenda is outside this scheme, and even here the external "moonlight" falls left to right. As far as garments are concerned many of figures have robes obliquely following this directional discipline, though noticeably several prominent figures, Christ in the *Entry to Jerusalem* or Judas in the *Arrest of Christ* [Pl.310] have decidedly frontal treatments. But at the same time, it is evident that, even besides this general usage, Pietro appreciated the directional nature of light playing on fabrics, and could use it creatively for dramatic effect. The *Last Supper* [Pl.308] has pronounced oblique fabric modelling from the firelight for the servants in the kitchen, while in the main room a clearly controlled variation in each figure's drapery treatment lets him attempt to show a central radiant light source.

It is apparent that many workers would use individual discretion to decide if the oblique lighting effects of the Cennini code did or did not occur. But, as might be expected from Cennini's claims to Giottoesque technical lineage, their appearance is noted in the works of Taddeo and Agnolo Gaddi through the mid to late 14th century.⁴⁷ However, more geometrically balanced sets of tones suggesting near frontal lighting

effects are widely seen in other narratives, as Altichiero's [Pl.366] and Guisto de'Menabuoi's work can show later in the century. A comparison between Taddeo Gaddi's Baroncelli Chapel *Life of The Virgin*, c.1328-34, [Pl.264] and the largely derivative c.1365 version by Giovanni da Milano in the Rinuccini Chapel [Pl.265], just yards apart, in S.Croce Florence can best show "orthodox" working and an illustration of the general departure from it. Certainly many of the later artists and their contemporaries, much closer in time to Cennini's writing, tend to show a tendency to provide fabric shading arrangements implying a more frontal lighting or even exhibit an ambivalence with little regard paid to Cennini's scheme. Giusto De'Menabuoi's rather broad working in the Padua Duomo Baptistery mid 1370's, offers draped garments in a standard way, with every indication of a repeated mechanical pattern of execution. Nonetheless, many end up as appearing lit from the front. At the same time, a number of pictures, as *Jesus among the Doctors* [Pl.381], take up the balancing ploy noted earlier in the Assisi *Massacre of the Innocents* (page 253-254 above) with lighting on figures on the right modelled left to right, those on the left from right to left and central figures lit frontally. Altichiero's more precisely observed and executed paintings in the Santo's S. Giacomo Chapel, finished 1379, or in the S Giorgio Oratory, between 1379-84, show close naturalistic observation of figures and their clothing, but these too are all lit from a near frontal position [Pl.366]. I write "near" since there is a slight bias to one side to accommodate, at least in sense if not strictly in angle, a consistent fall of light in step with local existing natural illumination in this chapel with several windows. His colleague, Avanzi, working on some of the earlier S. Giacomo frescoes showed some interest in oblique directionality in some exterior scenes or exterior parts of scenes but has frontal results in other circumstances, mainly interiors [Pls.374 & 375]. A rather more random collection of results might be found

in a late Trecento *Crucifixion* [Pl.352], in the National Gallery where several hands, including Jacopo di Cione's, were involved

The evidence in pictures then suggests that in this area Cennini was preaching a return to a more effective way of presenting volume in draped figures as developed and employed by earlier Trecento masters, but which was hardly in general use in the latter half of the century. Alternatively, he might have been reporting a return already underway at the start of the 15th century when, for example, both Gentile da Fabriano and Masaccio can exhibit the strong oblique lighting which gives some solid volume and some sense of spatial presence to their figures. Gentile's *Stigmatisation of St Francis* [Pl.398] illustrates the former and the Masaccio's Brancacci Chapel *Tribute Money* [Pl.406] the second.

These, though, are all narratives, and the suggested pattern of tonal values is not seen to any extent in formal devotional works. Here, with the presentation of content outward towards the viewer rather than across the picture plane as in narrative, a much more frontal effect is more generally to be seen. The garments are rounded off with darker tones on each side and the main lightly painted tones are more central than any rigorous following of the Cennini recipe would suggest. An example from the works of Giotto, Cennini's central authority, the *Ognissanti Madonna* [Pl.214] can show this, but of course the dark blue robe tends to mask the darker notes. The rounding off of the edges on the side of figures nearer to the assumed light, though not explicitly stated, could be read into Cennini's concluding instruction to finish off with the pure base colour. For example he suggests, in painting a red robe: "go over the dark parts, and around some of the outlines, with straight cinabrese".⁴⁸ Nevertheless, the addition of a thin stripe of the basic pigment, however gently blended, would not substantially change the main direction of lighting implied by the arrangement of the

other colours and tones, and could not provide for results like the *Ognissanti Madonna*.

The consideration of this more frontal lighting or at least the painting pattern which implies it, prompts a few questions on the rationale behind the use of light and shade here and for oblique lighting. Cennini does make the point that the natural lighting in a chapel ought to be followed and, as example, Giotto famously regiments his Arena Chapel frescoes' directional effects to fit the natural existing light from the main west window.⁴⁹ Some basic observation is required and was obviously carried out. But, while there is this advice to be directionally aware and the general strategy outlined above implies some oblique lighting, *Il Libro dell'Arte* locally treats of the fabrics reliefs, lights and darks with no immediate detailed suggestion of direction, even if observation would readily show this. Oblique lighting means the highlights, as observed, are on those sides of folds nearest the light source not on the high spots rising out towards the spectator. A close look at the work of a number of masters who demonstrate oblique lighting patterns, Duccio or Giotto for example, will show that such detail is, in most instances, accurately reported [Pls.293 & 228]. Here it is clear there was a close observation of the accidents of nature. For arrangements implying a more frontal lighting a different set of circumstances might apply. Here a concave object would have both receding sides perceived as progressively darker since, in their sloping away from any notional light, which is close to the viewer's position, they effectively, and progressively as they recede, collect less of the incident illumination. This fits more easily with the perennial concept or theory of "light tones advance and dark ones recede" allowing observation and rule of thumb to coexist or at least approximate to one another. Points nearest to the viewer are seen as lighter and farther ones, in deep folds or on the receding sides of a figure, are darker in a more

predictable way so that rise and fall of fabric is then more comfortably handled.

“Workshop theory” or rule of thumb as regards lighting distribution then conveniently fits a frontal lighting configuration.

There is a further aspect of implied directional sense, not mentioned by Cennini, which all painters tended to follow intuitively. This, a feeling for the vertical fall of light, appears in works across the board. The highlighting of all folds other than vertical, or near vertical, is concentrated on their upper edges. While this can be apparent on robes or covers of reclining figures it is often particularly apparent in cases where an arm or forearm is extended horizontally. The modelling balance of lighter tones and darker ones gives upper surfaces and contours rather more accented high lighting than it gives to those sides of folds presented to the chosen main lighting direction, while shaded areas tend to assist by being more obviously under folds rather than alongside them. At the same time the tonal depth of these folds are noticeably lighter than those below the outstretched arm. Such effects can be expected to follow from the fact that light is normally experienced, and habitually accepted, as being from above (see Chapter 1, pp.75-78 above). The sky or sun provides the normal illumination for exteriors, while indoors a lamp is invariably positioned above the level of any work or book to allow these to be profitably viewed and to clear any low obstructions. The evident change in “polarity” of light and shade patterns on extended arm or forearm in many cases, however, takes matters a bit further. Locally the illumination here is offered as decidedly closer to the vertical. This verticality, or rather its horizontal effects, while it is sought and generated intuitively, does help in underlining the upright orientation of figures and adds to any implied solid presence. In general it does not intrude, as an obvious contradiction of any general directional sense of light across the image, but on occasion there are instances which do serve to

show some habitual following of “light from above” rather than any consistency in direction. For example, in the Arena *Mocking of Christ* [Pl.231] one figure behind Christ on the left raises his arm and, whereas the rest of the picture adopts a consistent right to left fall of light on the robes of all other figures, here the effect of lightening the upper part of the forearm suggests a light incident from the left. Or again at Assisi the same disparity occurs in *St Francis Expelling the Devils from Arezzo* [Pls.199 & 200] where the Saint’s arm, lifted beyond the horizontal, is shaded such that locally the pictured illumination clearly is from the left, and not the right, as so obviously is the case for his face and the buildings beside him. Alternatively, a look at Duccio’s handling of similar configurations in the *Maestà* shows his more consistent following of a standard directional light rationale. He elected a strict left to right consistency throughout all sections of the work, *Recto* and *Verso*. However, he also observes light from a higher, but not vertically over-head, elevation. For instance, Gabriel’s extended right arm in the *Annunciation of the Virgin’s Death* [Pls.280 & 281] shows, in the description of its folds, a convincing observation of light from an elevated source on the left.

Historicism in Clothing

Cennini’s code and general approach applies to, and in some ways is restrained by, the commonly depicted garments in the mainly religious and often biblical themes of panels and murals of the period. In this respect a generally continuing historicism has such robes, voluminous, freely draped, cloaks or mantles, established as the habitual clothing of depicted characters. Some alternative, and more contemporary, apparel appears either with soldiers and their armour, or when some interest in genre is pursued by painters like the Lorenzetti, Pietro in particular, or again if, in the

following of court fashions and contrasting these with those of lower classes, a more secular element is included when an artist like Simone Martini is satisfying some noble patronage. In the main, however, the bulk of paintings have the main biblical characters in appropriately traditional garments. A different situation develops later in the century when there is a more general pictorial interest in current clothing and fabrics with painters like Avanzi and Altichiero [Pl.363] or those, like Gentile da Fabriano or Spinello Aretino [Pl.394], who in taking up aristocratic custom provided fashion and genre for the courtly art of the International Gothic style. But even then, and on into the Quattrocento, the tradition of showing Christ, the Virgin and Child, Holy Family, Saints etc. in the standard devotional works maintains this historical continuity even if attendant figures, as for example in the Strozzi *Adoration of the Magi*, are fashionably dressed. It is noticeable that in Cennino Cennini's *Il Libro dell'Arte* the chapters and sections concerning the painting of clothing and drapes implicitly assume that the garments being painted are the flowing stereotypical biblical robes. Nowhere does he make any comment concerning closer fitting or shorter garments, hose, jerkin or tunic for example, even if by the end of the Trecento, when he was writing, contemporary fashion favoured these rather than any fuller biblical type robes. S.M Newton in *Fashion in the Age of the Black Prince*, describes the 1340's advent of new imported fashions — French, German and Spanish — which replaced earlier flowing garments in Italy.⁵⁰

One of the features of earlier Romanesque and Byzantine stylised depiction of these full robes was the contrived suggestion of body and limbs beneath them; the “damp-fold” rendering noted above (see above p.240). Although this was no longer apparent in Trecento working, *Il Libro dell'Arte* carries echoes of the technique with some distinct interest in the forms beneath the robes. The underlying body shape was

to be observed with modelling, “always following out the shape of the nude” or highlights used to reinforce “certain strong reliefs as the nude of the figure requires.”⁵¹ Actual practice was, however, rather more subtle than this might suggest. Any too obvious signs had been progressively lost in the late Duecento. There the Assisi Upper Church illustrates transitions from the more tightly stretched fabrics of Torriti [Pl.164], or the Isaac Master [Pl.188], in the earlier upper registers of the nave, to the easier fall of many of the materials shown in the lower *Life of St Francis* [Pls.204 & 206]. Subsequently, Duccio’s *Maestà* [Pl.293] or Giotto’s Arena Chapel [Pl.228] can show, by the first decades of the 14th century, that a softer approach is the norm and any exaggerated signs of body or limbs had disappeared. No extravagant signs of clinging fabrics appeared in the Italian Trecento painting, whereas it is striking that Byzantine art did return to the affectation after the mid-1200s freedom seen in Sopoçani.⁵²

Patterned fabric

The fabrics considered thus far have been accepted as plain with modelling considerations untroubled by patterning. The simple modulation of colours and tones within an isolated form, accepting the self imposed chromatic discipline of *absolute colour*, is quite straight forward. However the depiction of patterned fabrics presented 13th and 14th century artists with both challenge and scope for adventures in three dimensional illusion. The appearance of additional colours and lines within isolated forms could contradict the simple tonal indications of the rise and fall of fabric, or the play of light across its undulations, and so offer alternative and confusing signals to viewers’ eyes. At the same time, when artists were intuitively reaching for linear perspective, there was the opportunity to let shading and linear representation of patterns work together in combined attempts at spatial illusion.

One straight forward technique used to indicate the rise and fall of drapery was provided by the plain undistorted pattern being over-painted, or glazed, to show the folds. Strictly speaking though, glazing is not an accurate term since the egg tempera medium used on panels, or in *a secco* additions to frescoes, due to its low refractive index, cannot offer a truly transparent film, even combined with pigments of low refractive index.⁵³

Two works by Duccio offer suitable illustrations of such over-painting. The *Rucellai Madonna* [Pl.271] shows deeply contrasted folds in the cloth of honour behind the throne. These are applied over a complex but unfolded pattern. The *Madonna of the Franciscans* has a similar unfolded pattern [Pl.273]. However, here the surface of over-painted folds has been lost through the years, to leave the background unmodulated. The unfortunate stark kitchen-tile-like appearance which is now disclosed draws attention to the untreated base provided for this procedure. The spectacular success of simple over-painting is then obvious in the *Rucellai Madonna*, where the outcome, a convincing illusion of local variation in depth, proves the quite independent value of the use of shading. Even a modest, economical, application of shading was sufficient to over-ride and subdue the complex pattern of the material to give it the plastic semblance of natural undulation. Such additions were also made, *a secco*, in fresco work. The *St. Francis Cycle* has a number of instances. The foreground bishop's robe in *The Confirmation of the Rule* [Pl.198] has a rigidly rectangular pattern. While some shading remains on the ground colouring of the garment, all reinforcing shading provided superficially has disappeared to leave a situation close to that of *The Madonna of the Franciscans*.

There were, though, moves to modify the drawing of such linear ornamentations, particularly later when intuitive steps were being made towards linear

perspective. The patterns could be warped and foreshortened as garments were wrapped round bodies, or laid out and seen to recede on seats or beds, or be rearranged to hang in appropriate curves in parallel with the fall of the material, or simply occluded, in part, behind implied folds. Variations in light and shade could work with, rather than be independent of, such graphic devices. In an early example, c.1270, The Master of St Francis for *St. Bartholomew* [Pl.138], from a now dismembered altarpiece most probably painted for S Francesco al Prato in Perugia,⁵⁴ used a partly interrupted and slightly realigned pattern together with over-painting to considerable success. Later Pietro Lorenzetti's 1320 *Pieve Madonna* [Pl.315] has quite limited signs of foreshortening and there are hints of realignment of the complex design on Mary's robe pattern. He does, though, make obvious use of occlusion to show the folding of the cloth, but noticeably only uses the interruption of the design, and no drawn line, to specify these masking bounds. On top of this a now faded red modelling follows the looping of cloth and the internal contours provided by the masking of folds. The graduated reds, even in their thinner state, add considerable substance to the material, and the body it encloses. Similar examples of such usage appear throughout the Trecento. Agnolo Gaddi in his c.1380 *Coronation of the Virgin* [Pl.391] has Christ's and the Virgin's robes executed with virtually no foreshortening of motif and only slight realignment of pattern. He relies mainly on some limited occlusion and glazed-over shading.

Apart from over-painting providing shading for the overall effect an alternative approach had the drapery fully modelled and fine decorative pattern then added. Catherine's robe in Duccio's *Maestà* [Pl.278] is an elegant example. This has a finely detailed linear pattern adjusted, tilted and curved, to follow the rise and fall suggested by the basic light and shade already established on the ground colours. The design

disappears neatly behind folds, but there is no real sign of foreshortening nor appreciable rounding off as it does so. Such procedure also continues on through the Trecento as details in Jacopo di Cione's 1370-71 San Pier Maggiore Altarpiece [Pl.355] can demonstrate.

One particular form of patterning offered some other fruitful areas of adventurous co-operation with light and shade. Rectangular checks and plaids provided a framework of lines to run in geometrically predictable ways over and round garments and drapery. Simone Martini made most effective use of the combination of shading and such regular patterns. Gabriel's cloak lining in *The Annunciation* [Pl.350] is wonderfully animated with an alliance of tartan and careful shading, while in the earlier *Knighting of St Francis* [Pl.342] in the Assisi Lower Church he had bent the arrays of the lines of fabric checks to offer recession and fold and supplemented these with shading in a convincing way. Also in the St.Martin Chapel Simone's *Dream of St.Martin* [Pl.343] shows the contoured surface of a chequered bedcover whose execution relied on different aspects of added light and shade responses combining with linear effects. General shape and the rise and fall of the fabric is reported in adjustments to the lines of checks within the matrix of a parallel recession. Broad shading then confirms the general rise and fall suggested by the undulations plotted by these lines with its deployment arranged to give a strong sense of light from the right. In addition detailed tonal modelling provides more localised variations. But these are not always paralleled by any ripple in the line structure, so that there the linear pattern remains locally flat, even if again shading convinces the eye of some wrinkles. The conventional idea of light tones offering proximity is shown with the distant surface of the bed darker than the nearer one. At the front, the horizontal surfaces are lighter than the front face, confirming light is from above. But the most dramatic and virtuoso

handling, however, occurs on the fall of material on the left, at the foot of the bed. Here shading and soft shadows augment occlusion and curving realignment together with some minimal foreshortening, to give the semblance of real fabric naturally lit.

Pietro Lorenzetti provided a similarly patterned coverlet for his *Birth of the Virgin* [Pl.319]. However, this, in strongly contrasting black and orange/yellow, had no detailed ripples to disturb it. Its main pictorial contribution other than prominent decoration is really more of a linear perspectival aid and the only point of lighting note was that its upper plane was lighter than the front. Ambrogio Lorenzetti, though, uses a simple combination of linear perspective and light to some effect in his little *Maestà* [Pl.333]. Here the complex patterned carpet offers linear recession, and the simple highlighting of the upper surfaces of the two-level dais lifts Mary's throne upwards and deeper into the centre of an interesting circular composition.

These various choices of technique were to be found through the Trecento but the virtuosity displayed by Simone Martini's adventures is not repeated. In general larger scale multicoloured patterns were not used in clothing fabrics but were restricted to hangings. Clothes draped over or tightly wrapped round bodies and limbs presented contortions and foreshortening of the patterns which were difficult to resolve.

Chrysography

One reactionary factor had a noticeable affect on the realistic light and shade treatment of clothing in Italian art from just after the middle of the Duecento until the early years of the 1300s. Chrysography, following precedents in Byzantine works, where it had been a feature of mosaics, panels and enamels for some time, came to be used extensively in painting from around 1260. An early manifestation of the form it took in Italian painting is Coppo di Marcovaldo's *Madonna del Bordone* 1261 [Pl.132]. It is a conspicuous, even a dominant, feature of this panel. The regularly sharp linear folds of the Virgin's robe are highlighted not in a lighter shade, as in the Cennini codè,

but in narrow striations of gold. Cennini made no mention of this particular form of embellishment which was largely obsolete in the 1390's when he wrote.⁵⁵ But then its main function was not to aid illusion but to offer visual dignity and status to the Divine and Holy through scintillating accents on their garments. The intrinsic value of the gold was appropriate for this. Its enduring qualities of intense reflectance also offered a obvious illustration of God's generous material and spiritual illumination displayed in the multiple highlights which as "bright mirrors of the eternal source of light", literally and symbolically, are a token of divine radiance.⁵⁶

Employed for its intrinsic brilliance, gold, used in this non realistic manner, was kept unsullied and free of modelling glazes, though these would later be employed to modify the mordant gilding on representations of patterned and brocaded fabrics (see p.272 -273 below). It did not readily assist naturalistic modelling being strictly speaking just a highlight device. Nonetheless, it was pressed into service in a form of linear modelling. The striations, indicating high points, and hence highlights on the clothing, would be augmented by a series of hatched, fan or comb-like arrangements. These effects, rather too ponderous to serve as crosshatch shading were employed to indicate sloping recessional planes or contours and might be given some curvature to suggest the flow of drapery in folds or round limbs and joints. The linear use of gold in this way clearly helped keep the depiction of drapery in many works tied to line drawing at the expense of light and shade.

But really the technique's essential purpose was decorative and symbolic rather than illusionistic. In this it looked for gold's brilliant reflections. These, though, are sharply specular, so that this brightness was dependant on angles of view and incident light. The viewer's movement and the fluttering of candle or lamp light was needed to demonstrate the full richness of the effect. The lively sparkle arising in the capricious transients of candle or lamp light of chapels brought a sense of rich vibrancy to these images. Consequently the image had to be experienced and appreciated as much as a richly ornamented three dimensional artefact as any naturalistic illusion. In this it suited those formal devotional works made for altars and consequently had some

continuing general currency in this area until the start of the Trecento. An item of beauty, satisfying the aesthetics of its time, and with the intrinsic value of costly elements, it was an intellectual and material votive offering. Such aspirations compromised the nascent attempts at realism now obvious in other aspects of painting. A balance and tension are then evident in such works between early leanings towards illusion and the needs of appropriate respect to tradition and divinity. In this, these panels are not at all inappropriate as indications of their time, mirroring the transitional nature of religious thought in Duecento society. The symbolic and the mundanely descriptive sit together here to bridge this world and the next in an anagogic manner accessible to late Duecento viewers. At the same time the technique's transience, lasting only about 50 years, is illustrative of the transitional nature of the art, and the society this reflects, as it moves towards a new understanding of itself and the Christian religion which is still a central part of its fabric.

While this particularly mannered use of gold in images was adopted by Italian painters in the middle of the 13th century and then became central to much of the late Duecento production of devotional painting, the signs of it had been available earlier in Byzantine inspired or executed works. Demus considers that its importance and usage arose ultimately from the use of gold backgrounds, suggesting pertinently that, against a gold ground, the dark silhouetted figures needed a similar bright treatment for their internal highlights.⁵⁷ Its detailed deployment possibly arose from the example of cloisonné enamels in the late 10th or early 11th centuries. The particular linear stylisation which corresponds to that webbing and comb-like hatching which was used in painting has been termed the "cloisonné" style and appears from around 1000.⁵⁸ It features in the Menologion of Basil II [Pl.107] of the late 10th or early 11th century and was then found in manuscripts across both eastern and western empires. Importantly it was copied in Montecassino manuscripts in the late 11th century and so had some *entrée* into European image making.⁵⁹ In mosaic we know of the stratagem from c.1040-50 in the Nea Moni, Chios, *Anastasis*, or from c.1100 when it appears in *The Incredulity of Thomas* at Daphni. [Pl.76]. It seems likely that some painted forms

similar to the mid to late 12th century *Enthroned Virgin and Child* panels [Pl.117] now in the Washington National Gallery provided models of chrysography for Italian painters; however no survivals can confirm this.⁶⁰ But if that is conjecture, mosaics in Italy provided illustrations of linear gold highlights from the late 1100s onwards in Venice's San Marco and Torcello's Sta.Maria Assunta. [Pl.91], while in Florence, before 1226, emphatic gold accents were used for the Christ Child's robes in the Baptistery apse mosaic [Pl.94]. Florence then saw continuity of the use of the technique throughout the 13th century and on into the early years of the 14th, in the provision of the Baptistery dome mosaics, and a late, but quite spectacular, example of chrysography appeared in the *Christ* [Pl.98] provided for San Miniato's apse in 1297.

Used as an attractive indication of status for holy individuals, this non-naturalistic adornment became a regular feature, in late Duecento painting. Apart from Coppo's *Madonna del Bordone* [Pl.132], it appeared in the 1262 San Bernardino *Madonna and Child Enthroned*, and Coppo used it again for his *Madonna and Child* in Sta.Maria dei Servi at Orvieto 1265-70. Such gold-embellished Madonnas found a general following in Sienese panels. Duccio's, *Crevoles Madonna* [Pl.268] can illustrate this. Cimabue made full use of it for his *Sta.Trinita Madonna* [Pl.160]. He also employed it on his earlier Crucifixes [Pl.159], though not in his later S Croce one [Pl.162].

Essentially non-naturalistic and not compatible with illusionistic light and shade, chrysography was often in conflict with painters' attempts to provide any sense of realism in images. Thus it did not feature quite so much in narrative works, though in these its selective use allowed the helpful discrimination of the relative spiritual importance, or status, of characters. Its usage in the late Duecento was more noticeable in devotional works where anagogic aims, needs for reverence and an appropriately prestigious aesthetic effect could outweigh any aspirations towards a more naturalistic representation. Even at that, a measure of painting's evolution towards realistic illusion can be seen in its relatively short general currency, that is

until the end of the Duecento. The late Duecento's and early Trecento's continuing trend towards a more realistic and immediate depiction of Mary and Christ might be seen to prompt a rejection of this contrived code while still accepting the prestigious connotations of gold in a more naturalistic way. A progression in this direction is apparent in Duccio's work. The device was certainly a feature of the *maniera greca* and in this the Byzantine heritage evident in his earlier Madonnas is moderated in later altarpieces and he becomes more selective in its use. While the Virgin's mantle is grandly gilded in the *Crevoles Madonna* [Pl.268] the *Rucellai Madonna* [Pl.270] has her mantle simply modelled in ultramarine with gold reserved for a trimming braid around its edges. Noticeably the Infant Christ has a fine web of gold articulating his vermilion robe. Indications of the particular status being accorded the individuals involved in different works are clearly also a complicating factor here. Later in his *Maestà* of 1308-11 [Pl.277] Duccio elects to provide the Virgin with a mantle naturalistically modelled and merely braided with gold. He restricts formal chrysographic effects to her tunic which is only partially visible beneath the robe. As far as the Infant is concerned his clothing, too, avoids any artificial and geometric highlights. His fine drapery has, in its place, the realistic representation of gold embroidery and fine edging with well executed modelling to tell of its delicate fabric.

Chrysography occurred in Duecento and early Trecento narrative works, or the narrative sub-panels of altar pieces, but was given a specific and carefully observed role to play. In the late 13th early 14th century *St. Francis Cycle* of the Assisi Upper Church the nature of supernatural appearances was underlined by gold striations. Christ and angels where they appear were given linear gold highlights, though these have largely been lost along with many *a secco* final touches.⁶¹ In the first decade of the 14th century Duccio makes similar differential use of the device in the narrative panels of the *Maestà*. The distinction is drawn here between the mortal Christ who has gold braid on his robe and the resurrected Christ who is given full chrysographic treatment with emphatic striations on robe and tunic. There are two exceptions to this general selectivity, but these, each in their own way, serve to emphasise the point.

The one episode, before Christ's death, when his garments are gilded in this manner is *The Transfiguration* [Pl.299] when his Divinity is prefigured. Then on the *Road to Emmaus* panel, after the Crucifixion, the incognito Christ is shown disguised as a mortal pilgrim and no divine gold coding is used. There is, too, for Mary an exceptional use of chrysography on her robe in a narrative scene. This occurs in the *Maestà Pentecost* panel [Pl.295] when she is touched by the Holy Spirit.

The fantastic effects of chrysography were avoided by Giotto in the Arena Cycle. He resorted to white garments with gold trim as a more realisable label of divinity consistent with representational work. Subsequently many painters of the early Trecento moved towards avoiding the arbitrary use of these gold highlights in altarpieces and frescoes. Gold, though, was still highly valued. It is prominent as a material of embellishment in the Trecento, but is given more realistic roles to play as border, trim or the indications of woven or embroidered gold fabrics. Some transitions towards the changing role can be seen in Pietro Lorenzetti's Assisi Lower Church Passion Cycle. Gold highlights are found on Christ's garments [Pl.307] and though these largely correspond to embroidered decoration a few are clearly contrived as affectations of chrysography. Simone Martini's paintings also offers examples of changing approaches. Two early works, c.1308-11, a *Madonna and Child*, Siena Pinacoteca No.583 [Pl.337], the earliest work attributed to him and one showing clear Duccio influence, and the Vertine *Madonna of Mercy* (though this is of doubtful attribution) both have overt chrysography. All his later paintings make sumptuous use of gold, but this is given expression in the illustration of rich fabrics and jewelled adornments so that it might be seen to help — in Trecento eyes — rather than hinder naturalistic depiction.

Later in the Trecento the use of gold in a "realistic" rather than arbitrary or symbolic way subsequently became general in both narrative and devotional works, though occasional recourse to chrysography might be seen to occur. For example, the c.1370 S.Pier Maggiore altarpiece by Jacopo di Cione has drapery finely high-lit with gold in the *Nativity* and *Adoration of the Magi* panels [Pls.357 & 358]. The effect is

perhaps not intentional and could be gratuitous on the rich clothes of one of the Kings and an attendant, but seems quite consciously employed for the *Nativity's* angels and the Christ Child's garment in the *Adoration*. A few other practitioners, Barnaba da Modena and Marco di Paolo Veneziano for example, however, intentionally employ the technique in traditional manner for conservative altarpieces well into the 14th century.

Gold and Silver

Chrysography was one particular, if noticeably non-naturalistic, element in Duecento and Trecento painting. Metals appear more widely in otherways : to represent themselves and as sumptuous decorative factors. Their use continues on and beyond the mid Quattrocento when Alberti would plead for the illusionistic depiction of gold's effects and offered "more admiration and praise for the painter who imitates the rays of gold with colours" while many of his contemporaries, like many earlier painters, used gold for its intrinsic worth claiming that "it gives majesty".⁶² The attractive ornate display of precious metal, as felt appropriate to the status of the figures with which it was associated and also as a token of patrons' prestige, was a continuing factor in 13th and 14th century painting. While it became particularly so in the late Trecento and early Quattrocento with the advent of the courtly International Gothic it had always been an important element. One of the most enduring manifestations of the use of gold was as the symbolic form of the gilded halo which continues on through the Trecento and Quattrocento. This, while it is so obviously a non-naturalistic device, does sit constantly in attendance on divine saintly figures and intrudes into any attempts at the realistic display of lighting effects. Its quite ubiquitous nature means that it is effectively discounted as an element in light and shade terms even when it is punched and inscribed or raised in

pastiglio. Constant usage has rendered it virtually invisible, or perhaps transparent, in illusionistic terms, even to twentieth-century eyes. It only becomes obvious when its standard form is modified, as later artists like Masaccio foreshorten it in the pursuit of linear perspective [Pls. 407 & 409], or when, in a way more germane to this study, the cheaper substitute materials which were sometimes used deteriorated and left the normally bright disc as a black intrusion. Some of the lower frescoes of Giotto's Arena Chapel, *The Washing of Feet* and *The Last Supper* [Pl.226], show such darkened haloes and the intrusive effect these now have on our appreciation of the picture in terms of light and shade.⁶³

There were few signs of a painted illusionistic depiction of gold's effects in 13th and 14th century painting. Gold, or a substitute, was used to represent itself. In this it was accepted in the main as another pigment amongst many. This is consistent with the period's conception of pigments. These were not so much colouring elements with accidental chromatic value, although this and their mixture offering different hues and tones was clearly appreciated, rather they were seen as materials, substances in their own right, with colour as an inherent constituent. Apart from any avoidance of attempts at shading on the thin strands of chrysography, as discussed above, gold used as pigment did require some treatments to offer some semblance of the play of light and shade. The different techniques are to be seen in Trecento painting and are also covered in Cennini's *Il Libro dell'Arte*.

In Chapters CXLI and CXLII he describes in detail the representation of cloth of gold or brocade. Here the item to be shown is laid out in gold and then suitable colour is painted all over.⁶⁴ The required shading and highlights for the object are then applied to this layer. The brocade, pattern or background effect is then provided by scraping the paint away to reveal the underlying gold. The disclosed gold might then

have further patterned detail imposed by stamping with punches, but other than this no alteration is made to the gold. The semblance of any lighting effect is provided by the modelling in the overpainted colours.⁶⁵

Chapter CXLIII lists different ways of presenting gold, or silver, fabrics.⁶⁶ Apart from repeating some of the procedures already covered in the preceding Chapters CXLI and CXLII others are outlined. The gold can be selectively over-painted with a pattern leaving areas of gold clear, avoiding scraping here, and then either pattern or gold is stamped with punch designs. Alternatively the basic gold ground can be overpainted with several oil glazes to indicate first pattern and then the shading of folds. Silver similarly can be glazed over. Further Cennini suggests that in these the colour of different upper glazes can be varied to offer *cangiante* shot effects (see above pp.250-252). He also, in this short but fairly intensive chapter, indicated another quite different means of providing the representation of golden fabrics. Here rather than working on a burnished, gold or silver, ground the background fabric is fully painted and modelled as for normal working. Only then is gold decoration is added locally by mordant gilding. In this the gold patterning, often detailed, is attached via a mordant, effectively an adhesive, which is brushed on to the background only where the gold is required.⁶⁷ No further shading is mentioned at this point and the ground's shading might be taken to suffice for folds. Later, describing a further brocade effect in Chapter CXL, Cennini suggests a final addition of both shading and highlights could be applied overall to a mordant gilded fabric.⁶⁸ St. Stephen in the San Pier Altarpiece illustrates this [Pl.355].

A system of directly modelling gold, with no painting employed at all, is also mentioned but described in detail in another passage. This is modelling by stamping : “*granare a rilievo*”. The modulation of light and shade, is achieved by selective

punch work with the instruction “in the folds and in the shadows do not do any stamping; not much in the half tones; in the reliefs, a great deal; because stamping amounts to making the gold lighter; because by itself it is dark wherever it is burnished”.⁶⁹ This repeats a point he had made still earlier that, if one looks at smoothly burnished gold, but from an angle which avoids any direct specular reflection dazzling the eye, then the gold appears “almost dark from its own brilliance.”⁷⁰ In this situation the punch marks would locally distort the surface and present the viewer with multiple highlights, more punching offering more highlights. A similar selective use of punch-work on gold, not for modelling but as a suggestion of depth, was pointed out by P.Hills. He notes that, in Simone Martini’s *Annunciation* [Pl.350], Gabriel’s stole carries some sophisticated suggestions of local linear perspective, “achieved by the use of two sizes of punch with identical pattern, the larger stamped in the nearer border, the smaller in the one further away.”⁷¹

As with gold the bright white metals were not generally depicted in any illusionistic way with paint. Silver was used widely to represent itself and to provide the metallic appearance of armour helmets and swords. It, and its substitute burnished and varnished tin, deteriorates quickly and though Cennini around 1400 did warn of its transitory nature it was universally employed before then.⁷² With widespread provision of Passion scenes, including *the Arrest of Christ* and *Crucifixions*, many Trecento pictures showed soldiers with military accoutrements. The helmets swords and armour were generally depicted in silver or tin. All of these have deteriorated and all we now have is a variety of dark shapes which deny the bright metallic nature of the pristine works. This is true throughout the 14th century, from Giotto’s versions [Pl.228] to those of Altichiero [Pl.368] near the end of the century, and even into the Quattrocento with Masaccio’s works [Pl.410]. The corruption has also destroyed any surface

treatment the white metals might have had. It seems reasonable to assume that tin and silver, treated to similar techniques as employ a variety of dark shapes which deny the bright metallic nature of the pristine works ed for gold, would have had some surface modification using differential glazing and overpainting to offer shading and modelling. But this can only be conjecture. We do not have any proof. There is, however, in this sorry history at least one interesting and important early Trecento exception to this dependence on silver. Surprisingly we find this in Duccio's *Maestà* [Pl.291] where gold and sumptuous display are otherwise in evidence and certainly the cost of any relatively small amount of silver would not have been a factor. In the twelve panels showing soldiers the illusionistic depiction of the bright military equipment is noticeable and adroitly executed. Swords, spears, halberds, helmets and chain mail are presented as painted elements. The detailing of spear tips and the halberd is very credible. The largest and most noticeable items, the helmets are treated quite convincingly, but have a rather matt appearance since they are modelled close to the standard way. There are no sharp highlights nor, more pertinently, any segments of darkness which would tell of burnished metal where, repeating Cennini's words, it would be "dark by its own brilliance." It could be that there was some continuing experimentation over the twelve panels carrying bright metal elements. Two or three different palettes are employed, as different essays in the representation of metallic items by paint. A very light range of white and grey, almost luminescent in effect, is employed in the *Arrest of Christ* [Pl.291]. Perhaps this lightness was an attempt to approach the brightness of polished metal. Others have more grey with this a little darker, while still others might have a touch of bronze, though this could be more a matter of the effects of age and deterioration or grime. The darkening grey also moves towards blue and this is noticeable in two panels, *Christ Accused by the*

Pharisees and particularly so in *Pilate's first Interrogation of Christ* [Pl.292]. The latter indeed with its darker blues comes closest, with its contrast, to a semblance of metal, albeit still somewhat matt rather than shiny. Perhaps, though, this would be making too much of what could well be simply the result of a spread of practices with the many workers involved. Nonetheless, the clear consistency of colouring of most other elements from one panel to the next, a feature of this extensive work, would tend to point to some consciously careful and continuing control of pigments and their application over each and every panel. But even if we could see this as a precocious piece of experimentation by Duccio, more than a century before Alberti, the example did not stimulate further development in this direction. Ugolino di Nerio, probably a pupil and assistant of Duccio's, in his 1324-25 altarpiece for Santa Croce, Florence, has some of his Passion scenes, follow the Duccio *Maestà* very closely, but with silver used for armour. The *Arrest of Christ* [Pl.300] and the *Road to Calvary* are cases in point. Intriguingly Ugolino does however avoid using metal for the spears and halberds. He paints these, though hardly as effectively as had Duccio.

Elsewhere, as noted already, other painters used metal rather than offered its effect in paint. In fresco, Giotto's Scrovegni Chapel amidst its early attempts at naturalistic effects of light has metallised armour and once more the *Arrest of Christ* [Pl.228] offers ready comparison.⁷³ The now blackened helmets surrounding Christ tell of the bright effects of the original. A survey of later artists confirms the general use of silver or tin in the depiction of bright metallic elements continuing through the Trecento and into the Quattrocento when Alberti made his point in 1435-36. Simone Martini, Pietro and Ambrogio Lorenzetti, all show its employment on into the mid-1300s. Still later Altichiero and Avanzi in the 1370s and 1380s can demonstrate the usage. In the early Quattrocento Massaccio uses silver for the sword of the angel in the

Expulsion of Adam and Eve in the Brancacci Chapel, and for soldiers' armour on the predella panels of the Pisa Polyptych [Pl.410]. At the same time an interesting late Trecento exception to this continuity is provided by Giusto de'Menabuoi. In the Padua Duomo Baptistry he did not use silver but chose to reproduced metallic effects in paint. The *Arrest of Christ* [Pl.383] is once more an example of this, showing clearly his quite effective depiction of armour in paint.

With limited exceptions the use of metals themselves then was a common, near universal way, of presenting their effects in painting. Their particular bright presence was an attractive factor in picture-making, but they were treated largely as another set of pigments. Noticeably Cennini did not complain of their use as simulating themselves but only warned of the impermanence of silver.⁷⁴ The rather capricious reflections of metal work do not allow the artist full control of his image. Nonetheless, the conventions and aesthetic demands of the time were difficult to reconcile with any whole hearted pursuit of pictorial illusion and, apart from some isolated adventures, convention and fashionable comeliness took precedence here.

Chapter 5 Notes

- 1: Hills, *op.cit.* p.107.
- 2: D.C Winfield, 'Middle and Late Byzantine Wall Painting Methods', *Dumbarton Oaks Papers*, 22, 1968, p.128, notes the blending of flesh tones in careful modelling. "Faces and flesh made in this way are, in fact, the only parts of Byzantine wall painting where there is no sign that the painter was in a hurry; on the contrary, there is evidence that for these he exercised much care and expertise....The rounded effect of blended flesh colours often makes Byzantine faces and flesh the least linear and the most realistic part of a composition in that they appear to have depth and to approximate an imitation of nature."
- 3: *Ibid.*, pp.125-6. Byzantine painters did not mix paints on the wall, but on the bench. Winfield suggests "shading" and "blending" is misleading as applied to Byzantine works and the resulting separation of tones and colours is argued to suit flat linear patterning, and explains the predominantly linear appearance of Byzantine painting.
- 4: Vasari,(de Vere) *op.cit.*, Vol.I, p.50.
- 5: Cennini, (Thompson), *op.cit.*, Ch.I, p.2, outlines his following of Giotto practices via Taddeo and Agnolo Gaddi. Ch. LXXI-LXXXIII, pp.49-51, covers the basic procedures in depicting drapery in fresco, together with *a secco* additions, for mural working, while Ch.CXLV-CXLVI, pp.91-93, describes those variations which are required for tempera on panel.
- 6: Old St Peter's Apse was destroyed in 1592 during rebuilding, only fragments survive. The Sta.Pudenziana Apse, somewhat cut down and heavily restored, is still extant.
- 7: See Introduction Chapter p.47, note 15.
- 8: Dodwell, *op.cit.*, (*Pictorial Arts*) p.44.
- 9: Demus, *op. cit.* (*Byzantine Art*), provides convincing arguments of the dependence of Romanesque art on Byzantine images. In pp.30-43, on discussing the dissemination of Byzantine images in Europe via pattern books he draws attention to the linear translations of Byzantine originals into Romanesque stylisation. The first iconoclastic controversy dates from c.725 to 786. The Emperor Leo III declared all images to be idols in 726. The Seventh General Council at Nicaea decreed the restoration of icons in 787. Under Leo V, in 814, icons were again condemned and their final restoration did not occur until 843. (*Oxford Dictionary of the Christian Church*, 2nd ed., Oxford, 1977, pp.687-688).
- 10: Dodwell, *Pictorial Arts*, *op.cit.*, p.56, & Demus, *op.cit.* (*Byzantine Art*),, pp.60-65. The *Coronation Gospels* provided for the Carolingian court at Aachen are considered to be the work of a few artists called to the court from Constantinople or Byzantine Italy. With regard to dates, Demus *ibid.*, pp.61-62, points out that though originally considered as later works, Koehler proved textually that they were coincidental with the Palace School works c.800.
- 11: A.Martindale, *op. cit.* (*Gothic Art*), p.69: "This damp-fold style is so called on account of the clinging, damp appearance of the drapery. It provides a method of distinguishing the substance of the body beneath the material without losing the decorative character of the surface, and the finished effect is one of smooth areas of surface surrounded by decorative lines".
- 12: A.Grabar, *Byzantine Painting*, Geneva,1953, p.141, writes that an "inscription tells us, besides the date, that they were commissioned by a member of the Comneni

- family”, and Rice, *op.cit.*, p.127, notes that “it was done for a member of the Commene family, in all probability by artists from the capital”.
- 13: Zanardi, in *Sancta Sanctorum*, *op.cit.*, p.236, found at least four distinctive basic approaches by the different ateliers involved.
 - 14: Romanini, *op.cit.*, p.283.
 - 15: White, *op.cit.(Birth and Rebirth)*, p.48. “A series of inscriptions dates the frescoes of ‘*The Life of St. Paul*’, formerly on the left of nave on entry, to the years 1278-9. The Old Testament scenes, once on the opposite wall, can similarly be placed, with a high degree of probability, but without the same certainty, in the period between 1282 and 1290.” The now lost frescoes have been recorded and accepted as by Cavallini since the 15th century when Ghiberti wrote that, among the painter’s Roman works, “In santo Pagolo era di musayco la faccia dinanzi ; dentro nella chiesa tutte le parieti delle nave di mezo erano dipinte storie del testamento vecchio”. Lorenzo Ghiberti, *I Commentarii*, ed. L.Bartoli, Florence, 1998, p 87. See also White, *op.cit.(Lost Frescoes)*, pp.84ff.
 - 16: The Vatican Library Cod. Barb. Lat. 4406 copies were commissioned by Cardinal Francesco Barberini in 1634.
 - 17: The discussion on Cavallini’s late Duecento chronology is involved and not resolved. P.Hetherington, *Pietro Cavallini*, London, 1979, p.129-134, particularly p.133 and n.13 pp.135-6, illustrates the complexity of the discourse. J.Gardner ‘Pope Nicholas IV and the Decoration of Sta Maria Maggiore’ in *ZeitSchrift für Kunstgeschichte*, 1973, pp. 8-9 supports the “the priority of the mosaics in Sta. Maria in Trastevere over the frescoes in S.Cecilia” on a matter of gothic influence. P.Toesca *Pietro Cavallini*, London, 1960, p.12, for stylistic reasons feels the “mosaics are probably somewhat earlier than the frescoes of Santa Cecilia.” White *op.cit.(Birth and Rebirth)*, p.51 & p.56 note 51, initially favoured the opposite, citing others including G.Matthiae, *Pietro Cavallini* Rome, 1972, of similar persuasion, but then later in *op.cit.(Art and Architecture)*, p.155, he is more circumspect, “The frescoes are not documented. Even their date is less secure than is frequently assumed to be.” Comparisons are then drawn between the two cycles with no priority indicated.
 - 18: White, *op.cit.(Art and Architecture)*, p.149.
 - 19: Lunghi, *op.cit.*, p.20, notes that the iconography of “St.Francis receiving the Stigmata” conforms to Thomas of Celano’s *Vita Secunda* of 1247 and therefore is not consistent with St.Bonaventura’s *Legenda Maior*, recognised as the official version in 1265 and so confirms a pre-1265 date for this Lower Church cycle by the Master of St Francis. The time table, approx 1280s to 1305, for the decoration of the Upper Church is subject to some debate, see pp.136-141 above. The Lower Church transepts, crossing and the adjacent chapels are most likely to have been painted from late in the first decade and through the second decade, see Maginnis, *op.cit.*, p.515. The St.Martin chapel was frescoed c.1317. Puccio Capanna c.1337-40 painted the *cantiere* and the apse (over-painted in the 17th century). The St.Catherine Chapel painted by Andrea de’Bartoli in 1368 was the last major Trecento project.
 - 20: Morello & Kanter, *op.cit.*, pp.70-79, brings the various panels together, and D. Gordon, ‘A Perugian Provenance for the Franciscan Double-sided Altarpiece by the Maestro di S.Francesco,’ *Burlington Magazine*, 124, 1982, pp.70-77, argues for their original combination in a 1272 altarpiece for S.Francesco al Prato in Perugia.
 - 21: See Chapter 3, p.203. note 74 for Theophilus, *De Diversis Artibus*, also Viñas, *op.cit.*, p.115-116, outlines the various early manuscripts and their likely dates. He

- says of the Lucca Manuscript "It is an unsystematic collection of recipes, written in Italy in the latter part of the eighth century or at the beginning of the ninth century." But that it derives from a Spanish text from 725, and this in turn derives from a still earlier one around 650, which was probably a translation of even earlier Greek texts. Of the *De coloribus et artibus romanorum*, attributed to Eraclius, he writes that the first two books were written in Italy in the tenth century while the third book was probably written in French in the thirteenth century. His information on the *Mappae clavicula* tells that the original text "was written in northern Europe in the ninth or tenth century and was expanded by several additions in the twelfth century." and that "it has strong links with the 'Lucca Manuscript', incorporating many of the same recipes." M.P.Merrifield, *Original Treatises on the Arts of Painting*, Vol. I & II, London, 1891, includes in Vol.I, pp.182-257, the Eraclius, *De coloribus et artibus romanorum*.
- 22: Winfield, *op.cit.*, p.123, suggests similarities in Theophilus, Cennini and the later Dionysios of Fourna all derive from a common source and also that the common source, or sources, is likely to be Byzantine since Theophilus' *De Diversis Artibus* prologue tells that he offers "quicquid in diuersorum colorum generibus et mixturis habet Graecia . . . whatever kinds and blends of various colours Greece possesses." Theophilus (Dodwell) *op.cit.* p.4.
 - 23: Cennini (Thompson), *op.cit.*, Ch. LXXI, p.49.
 - 24: *Ibid.*, Ch.LXXI, p.50.
 - 25: *Ibid.*, Ch.CXLV, p.92.
 - 26: Theophilus (Dodwell), *op.cit.*, Ch.VI, p.7, has ". . . cum aqua lavabis" which Dodwell interprets as "blend in with water". Alternatively Hawthorne and Smith, Theophilus (Hawthorne and Smith) *op.cit.*, Ch. VI. p.18, provide a quite literal translation, "and wash with water", but expand, in a footnote, their understanding that a blended transition is meant for, "The intent is to soften the contrast between the white and *veneda* by working over the junction with a wet brush."
 - 27: *Ibid.*, Ch.VIII, p.7: "et fac subtiles tractus super rosam in facie, in collo et in fronte," and Ch.IX, p.8: ". . . et super priorem linies subtiles tractus per omnia".
 - 28: *Ibid.*, Ch.XIV, p.10. "Post haec misce parum albi cum lazur et fac subtiles et raros tractus"
 - 29: Winfield, *op.cit.*, p.125. Byzantine wall painting technique did not mix paint in the picture surface. Colours were "mixed and blended only in their respective pots, never on the wall." and this he suggests leads to "the predominantly linear appearance of Byzantine paintings."
 - 30: Hall, *op.cit.*, p.47 "Alberti recommended to painters a method of down-modelling that approximates more closely to the way we see colors. In place of Cennini's pure color shadows and up modeling in graduations of white, he advises the addition of black to create the shadows."
 - 31: Colour printing and colour television conveniently take advantage of the relatively lower colour acuity, or sharpness, of our sight. In printing we find the primary colours, in this case, cyan, yellow and magenta, are printed to modest levels of sharpness and a further printing of black provides the sharp detail and edges. In television a similar reduction in the detail transmitted for colour, with sharper detailing carried in the black and white signal, allows for more efficient use of the frequencies employed.
 - 32: Hall, *op.cit.*, p.15-16.
 - 33: Shearman, *op. cit.*, p.4.

- 34: *Ibid.*, p.2 “Absolute colour...a coherent and self sufficient system created in the early centuries of Christian Art and wide spread in its use until the end of the Middle Ages.” In this “Each colour plane, thus separated, is perfectly consistent in chromatic value...a silhouette flooded with a single colour.”
- 35: Cennini,(Thompson), *op.cit.*, Ch.LXXVII-LXXX, pp.53-54, Ch.CXLIII, p.89 and Ch.CLX, p.102. Of the eight mentions of shot effects not one indicates any interest in the tonal variations or modelling potentials.
- 36: *Ibid.*, Ch.LXXVII, p.53: “If you want to make a shot drapery for an angel in fresco, . . .”
- 37: Kemp, *op.cit.*, pp. 265-6, points to the sophisticated employment of *cangiante* effects by many later artists, citing among examples Mantegna, Pontormo, Vasari, and Raphael, and noting the effects were still exploited “for their inherent beauty, independently of primarily naturalistic considerations.”
- 38: Hall, *op.cit.*, p.21, suggests it is Giotto’s invention. Demus, *op. cit (Byzantine Art)*, p.237, cites 12th century Balkan examples and sees it as signs of continuity of Hellenistic heritage in Byzantine working.
- 39: Hills, *op.cit.*, p.19-20.
- 40: Cennini (Thompson), *op.cit.*, Ch.LXXI, p.49.
- 41: *Ibid.*, Ch.LXXII, p.51.
- 42: *Ibid.*, Ch.LXXVII, p.53.
- 43: *Ibid.*, Ch.CXLV, p. 92. Here the rather free Thompson translation seems misleading even though it might still imply the sense of being on the dark side. It gives, “around toward the light part of the figure”. Cennini (Tempesti) *op.cit.*, p.115, gives the Italian as “*inverso il lume della figura*”.
- 44: Cennini (Thompson), *op.cit.*, Ch.VIII, p.6 : “always follow the dominant lighting; and make it your careful duty to analyse it , and follow it through.”
- 45: Maginnis, *op.cit.*, p.515, The various Giotto workshop projects are likely to have been executed after the Arena chapel and completed before c.1316-17 when Pietro Lorenzetti’s work in the south transept commenced.
- 46: *Ibid.*, p.515.
- 47: Cennini (Thompson) *op.cit.*, Ch.I, p.2. In tracing his own contact with Giotto, Cennini tells of the master - pupil relationship between Giotto and Taddeo Gaddi and then between Taddeo and his son Agnolo.
- 48: *Ibid.*, Ch.LXXI, p.50.
- 49: See note 44 above.
- 50: S.M.Newton, *Fashion in the Age of the Black Prince : A Study of the Years 1340-1365*, Woodbridge, 1980, pp.2-3, describes the early 14th century clothing of Italy, and pp.6-13 the nature of the styles which superseded them.
- 51: Cennini (Thompson), *op.cit.*, Ch.LXXI, p.50. and Ch.LXXII, p.52.
- 52: Grabar, *op.cit.*, 1953, p.151, sees in post 1300 Byzantine painting “a reversion to academicism , either mannered or baroque, and more in line with the traditional procedures of Byzantine art”. K.Weitzmann, *The Icon*, New York, 1982, p.9. Considers this as the Palaeologan era’s reaction to Western influences after the “mutual interpenetration” of the period of Crusader states and the Latin Empire.
- 53: Bomford, *op.cit.*, p.29.
- 54: Morello & Kanter, *op.cit.*, pp.70-74.
- 55: Cennini (Thompson) *op.cit.*, *passim*. There is no sign of chrysography being offered as a form of highlighting. The nearest to such working is perhaps in Chapter CXLVI, p.93. with talks of adding pattern or brocading, and this is then shaded over to indicate shadowed folds leaving the gold as bright pattern in places.

- 56: Hills, *op.cit.*, p.25.
- 57: Demus, *op.cit.* (*Byzantine Art*), pp. 233 & 236.
- 58: *Ibid.*, p.103.
- 59: *Ibid.*, p.103.
- 60: The date of the Washington *Enthroned Virgin and Child* is debated. Demus, *op.cit.*, (*Byzantine Art*), pp.216-218, discusses this, deciding on a mid-1200s date himself, but indicating that others suggest a late 12th century date.
- 61: L.Tintori & M.Meiss, *The Painting of the Life of St.Francis in Assisi, With Notes on the Arena Chapel*, New York , 1962, p. 88.
- 62: Alberti (Spencer), *op.cit.*, p.85.
- 63: Tintori & Meiss, *op.cit.*, p.178. The darkened haloes on analysis were found to be “composed of lead, copper, silver, and a little gold; a false gold, in other words that has oxidized.”
- 64: Cennini (Thompson), *op.cit.*, Ch.CXLI & CXLII, pp.86-88.
- 65: Bomford, *op.cit.*, pp.130-134, describes and illustrates this *sgraffito* and punching technique reproducing the process which was employed in this way for Nardo di Cione’s 1365 *St.John the Baptist with St.John the Evangelist and St.James* in the National Gallery London. There is also informative description and illustration of gilding in general on pp.21-24.
- 66: Cennini (Thompson), *op.cit.*, Ch. CXLIII, pp.88-89.
- 67: Bomford, *op.cit.*, pp.43-47, informatively discusses and amply illustrates the technique of mordant gilding with direct reference to actual Trecento works in the National Gallery in London.
- 68: Cennini (Thompson), *op.cit.*, Ch.CXLVI, p.93.
- 69: *Ibid.*, Ch.CXL, p.86, and the Italian is: “. . . granare a rilievo . . . nelle pieghe e nelli scuri non granare niente; ne’ mezzi un poco, ne’ rilievo assai; perché il granare, tanto viene a dire, chiareggiare l’oro; perché per se medismo è scuro dove è brunito.” Cennini (Tempesti), *op.cit.*, Ch.CXL, p.110.
- 70: Cennini (Thompson), *op.cit.*, Ch. CXXXVIII, p.84, the Italian being “squasi bruno per la sua chiarezza.” Cennini (Tempesti), *op.cit.*, p.109.
- 71: Hills, *op.cit.*, p.109.
- 72: Cennini (Thompson), *op.cit.*, Ch.LXXXXV, p.60.
- 73: L.Tintori, ‘ “Golden Tin” in Sienese Murals of the Early Trecento’, trans, E. Borsook, *Burlington Magazine*, 124, (1982) pp.94-95, reports, p.95, that the now darkened armour in the Arena Chapel was of tin, *stagno bianco*.
- 74: Cennini (Thompson), *op.cit.*, Ch. LXXXXV, p.60.

CHAPTER 6

ARCHITECTURAL BACKGROUNDS

Light and shade can give a suggestion of solid volume for faces, figures and their robes and offer some appearance of three dimensional reality, but the effects are purely local and isolated. Before they can contribute to a broader sense of space these individual items need to be seen in wider contexts which themselves have extended schemes of illusion. The developing architectural backgrounds seen in the last decades of the Duecento as painters reached out intuitively for systems of linear perspective offered such pictorial contexts. The rectilinear nature, or generally regular shapes, of buildings, interior or exterior, together with their associated furniture, provided experimenters in linear perspective with an easier task to represent them than the more organic forms of the face and body did. The same might be seen as true in matters of techniques in light and shade which are required to work hand in hand with these geometric ones. Predictable arrangements following accepted rules and conventions will, in this inorganic side of the world, allow of some mechanical certainty or geometric simplification. For here we are considering planes and flat or regular surfaces, and “theories” or rules of thumb should offer consistent and predictable results with such straight forward subjects. Such obvious results and these regular building structures let us see these rules in action in step with linear perspective.

At this point it is worth outlining the different perspective configurations to be found at this period of development and innovation in European painting and with which any light and shade measures would have to work. The basic definitions and terminology here follow that defined by J. White in *The Birth and Rebirth of Pictorial Space*.¹ The simplest form of presentation, *frontal* [Fig.39 facing page 284], has a

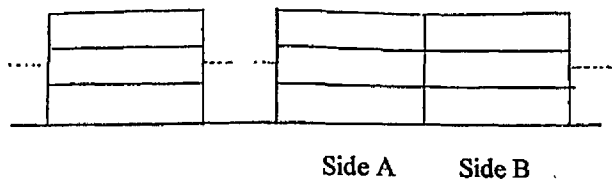


Fig 39 : Frontal

Fig. 40 : Complex Frontal

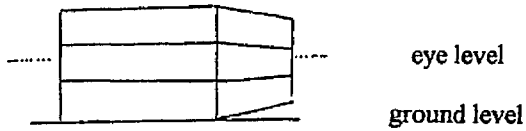


Fig. 41 : Foreshortened Frontal Normal View

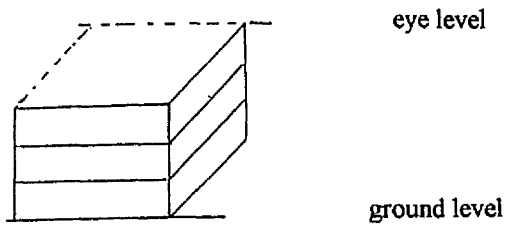


Fig. 42 : Foreshortened Frontal High/Birds Eye View

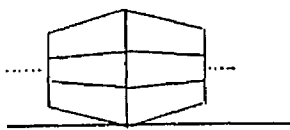


Fig. 43 : Oblique - Extreme



Fig. 44 : Oblique - Softened

building's characteristic front face presented as a plane parallel to the picture surface. If a second, or third, side is offered, this can be shown in a similar way, again frontally presented, and effectively rotated through 90^0 — a rectangular structure is assumed — to be seen alongside the first face giving the *complex frontal* setting [Fig.40]. Alternatively, a second side can be added with its upper and lower outlines at an angle, initially parallel or, in later developments, apparently converging, to give us the *foreshortened frontal* arrangement [Fig.41]. Importantly, but not explicitly covered by White, *foreshortened frontal* settings could appear with different *viewpoints* or *eye-levels* implied. A high view point saw the receding side's outlines rise on the picture plane [Fig.42]. This "bird's eye view" was a feature of early depiction offering more general and wider geographic information, akin to a map or plan. A lower *viewpoint* with implied sighting levels, say, just mid way up a building's walls, required the top of a foreshortened wall to decline on the picture plane and its base to rise, a point specifically, but no more accurately, put by Cennini, when he writes, "And put in the buildings by this uniform system : that the moldings which you make at the top of the building should slant downward from the edge next to the roof ; the molding in the middle of the building, halfway up the face, must be quite level and even ; the molding at the base of the building underneath must slant upward, in the opposite sense to the upper molding, which slants downward."² For the *oblique* arrangement the building is presented at an angle with each of two visible sides receding into the picture space and neither taking up a position parallel to the picture plane. A further modification to this allows for the differentiation between a forced perspective with sharp recession and a more subtle, less insistent one, the first being designated *extreme oblique* [Fig.43], and the second *softened oblique* [Fig.44].

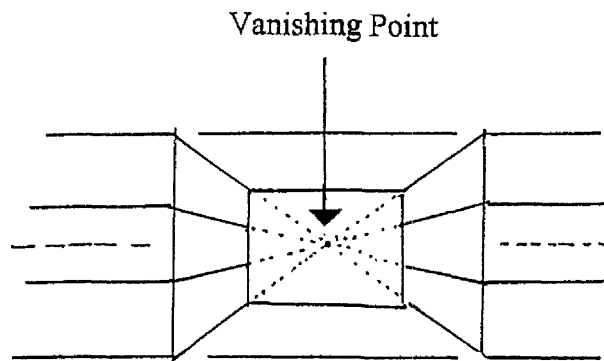


Fig. 45 : Central Perspective

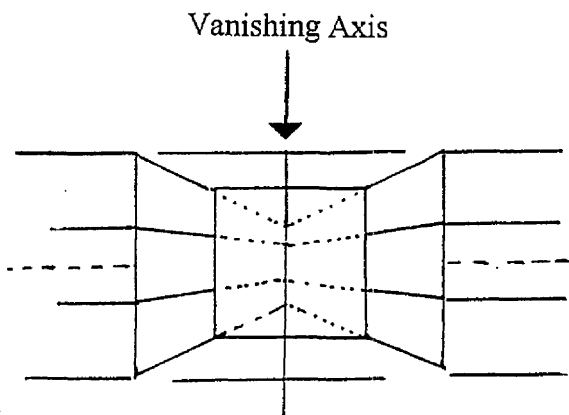


Fig. 46 : Axial Perspective

Further variations in perspective configurations arise in considering depiction of interiors. Earlier use of the frontal arrangement generally avoided interior depiction, placing any architecture at the rear of the main figures, as a token of the location with no attempt being made to suggest enclosure. Relative scale, that is building compared to figures, was also limited, allowing the full characteristics of any structures to be portrayed. Innovations, or developments, looking for a convincing interior context for figures and a sense of enclosure, occurring during the late Duecento and early years of the Trecento, made use of foreshortened frontal working, but with a lower view point allowing ceilings to be involved. Though selections of the various approaches, both for interiors and exteriors, continue on into the Trecento — for example the full range is tried in Giotto's Arena Chapel — the various stages in this evolution are well illustrated in the Upper Church of S.Francesco, Assisi. Using the device of ignoring the front wall the resulting skeletal room, or loggia, of the Isaac Master's *Isaac Blessing Jacob* [Pl.189] illustrates the foreshortened frontal form while the slightly later *St.Francis before the Crucifix* [Pl.192], with its walls also dissolved, illustrates the softened oblique one. Further contemporary development brought the foreshortened frontal setting into a symmetrical arrangement. The wholly, or partly dissolved, front wall is brought, still parallel to the picture plane, close to, or coincidental with the image surface and the receding walls, now both within view, are shown foreshortened left and right. *The Confirmation of the Rule* [Pl.197], again in S.Francesco's nave, shows this. This last development, with symmetrical recession of walls, ceiling and floor, shows late 13th century workers reaching out empirically for a centrally organised linear perspective, *centralised* or *one point perspective*, [Fig.45] as eventually developed by Brunelleschi and Alberti in the Quattrocento. Here the horizontal outlines of the side walls, as orthogonals, nominally perpendicular to the

picture plane, all recede to a single *vanishing point* in the centre of the composition. However, Trecento painters had not quite reached such a resolution and their best attempts at it provided *axial perspective*, where the orthogonals converge on a central vertical axis [Fig.46 facing p.285].

It should be noted, of course, that these graphic developments are revivals, or re-adoptions, of *foreshortened frontal* and *oblique* settings and *centralised perspective*, rather than any *de novo* invention of them. These configurations had been in use in antiquity and developed forms appeared in Greek and Graeco-Roman art [Pl.33 & 35].³ As art developed within the early Christian Church towards an art of spiritual reflection, rather than one of natural representation, more stress was placed on the picture surface as an essentially symbolic message was refined. Progressively images avoided the oblique forms, whose apparent diagonal planes did not sit comfortably on a simple surface, then the foreshortened frontal presentations appeared less frequently, and even these were often used as formal patterns rather than with any appreciation of their three-dimensional effects.⁴ The first significant re-emergence of these procedures in the mid to late Duecento might be seen in the renovations carried out by Cavallini in S. Paolo fuori le Mura, [Pl.171] now unfortunately known only through 17th century sketches.⁵

Exteriors

In looking for early uses of light and shade it becomes clear that the effects of the rule discussed earlier (see above Chapter 1, pp.67 ff.), that lighter tones signal advance while darker ones indicate recession, play a large part in many early Duecento representations of architecture. In these two very noticeable interpretations of this axiom are employed in the then standard depiction of buildings. These follow

procedures, codified in Theophilus' late 12th century compilation of craft techniques, *De Diversis Artibus*,⁶ and are well illustrated in some of the works of Guido da Siena's workshop [Pl.141]. In the first procedure, with rectangular buildings presented frontally, and their walls fully parallel to the picture plane, an arbitrary hint of projection and recession is provided by highlighting a notionally near edge and shading a further one. The device is used as a standard code rather than any attempt to report lighting actuality. No sense of any directional fall of light is suggested, and indeed the gradations tend to be organised for pictorial balance or with recession to the sides of the panel. The second, related, stratagem is also shown here. Round towers are depicted with their convex forms implied by central strips of light tone to accent projection forward in the fictive space.⁷ Such procedures were in general use until the mid to late Duecento, but disappeared later in the century.

Signs of such usage, still appear in the 1277-80 Sancta Sanctorum frescoes alongside indications of transitional changes. Here there is a mix of treatments to tell of the obsolescence of the Theophilus schema and the advent of newer approaches. With changes occurring in geometric perspective techniques the building surfaces are no longer presented in the *simple* or *complex frontal* form, flat and parallel with the picture plane. They are now shown in a *foreshortened frontal* arrangement so that, while the main surface is offered as before, side walls recede at an angle. The linear foreshortening construct proved effective in suggesting depth and there was then less need for the forcefully coded tonal hints of recession. The *Martyrdom of St Peter* [Pl.151], shows a number of buildings with foreshortened aspects. In some the front faces still effect the lighter touch of suggested projection down one side. However the receding sides are unmodulated in tone. Their different orientation with respect to the front faces of buildings, now indicated by geometry, is adequately expressed by

simple flat tones. Two other structures there, the pyramid and the column, in the centre of the representation of Hadrian's Mausoleum, have no modulation on their frontal aspects or sides. Elsewhere in the same fresco further hints of change appear. Two circular towers in the background still carry the prescribed emphatic central accents of light colour, but the large circular mausoleum is much more gently modelled with a softer brightening in the centre. This modelling, though, is still symmetrically placed, in this case conforming to the "light tones project" orthodoxy.

An idea that receding flat planes can be adequately expressed with uniform tone while tonal variations within planes are reserved for signs of a concave or convex nature might be seen to be emerging. However, this concept and procedure, to be seen in the bulk of late Duecento and Trecento architectural depictions, is not matched by any theoretical statement or text until Alberti states in 1435-36, "Remember that on a flat plane the colour remains uniform in every place; in the concave and spherical planes the colour takes variations."⁸ It is worth noting that this idea is valid when applied to *exterior* natural light where the great distance from the sun, or even from an overcast sky, means there is no significant measurable difference in light intensity incident along the length of a building's wall. Indoors, however, the distribution of light, artificial or via limited windows, can give different results (see Chapter 1, p.71). A further fresco in the Sancta Sanctorum provides an early illustration of this new approach, and one clear of the combinations of treatment seen in the transitional *Martyrdom of St. Peter*. The small replica of the chapel being presented by Pope Nicholas III to Christ [Pls. 145 & 149], is shown in a *foreshortened frontal* alignment. Significantly there is no tonal gradation within each plane, as Theophilus might have required. The front face is lighter than the receding side. This could correspond to the notion that the forward plane ought to be brighter but, at the same time, it also is

consistent with an appreciation of the general fall of light, left to right, in the rest of the mural. The detailed shading of the recesses supports this and helps confirm the notion expressed earlier of the growing conscious awareness of directional effects of light.

In seeking compatible integration of lighting effects within these revived and developing geometrically perspectival forms painters had to address the oblique as well as the foreshortened frontal construction. Combinations of the two forms are used in works from the late Duecento onwards, the Assisi Upper Church, for example, showing such mixtures. The more sophisticated oblique arrangement might be seen as an advancement, satisfying aspirations towards a sense of depth, with its very positive insistence on projection and withdrawal. But even if it was obviously re-established by the end of the 13th century, as Assisi shows, the alternative foreshortened frontal setting, continues on through the Trecento. While the subtle softened oblique form, if expertly controlled, could fit into pictorial schemes, adding illusion without drawing too much attention to its technique, a more aggressive extreme setting could intrude as a self-conscious presentation of technical expertise. The Taddeo Gaddi *Presentation of the Virgin* [Pl.261], is perhaps an example here. It is a virtuoso performance of oblique working, and is celebrated as a fairly successful early attempt at linear perspective. But the overt use of extreme oblique technique dominates the picture and punctures rather than fits into the picture space. On the other hand the foreshortened frontal presentation has no such conflict, with its main element sitting comfortably in parallel with the picture surface. In this its co-planar arrangement was more compatible with the wall or panel surface than the more intrusive or aggressive statement of the oblique setting. Additionally, when the details of windows, doors, recesses etc. are added, the positioning of what are in the main, further rectangular, or

at least regular geometric, architectural elements within normally rectangular panels or frescoes has a purposeful sense of appropriate pattern.

The factor of compatibility between picture surface and flatly shown architecture was perhaps critically influential in this continued use of the frontal foreshortened setting. It is generally considered that there was a “slackening, and even reversal of the acceleration towards realism, which is characteristic of the painting of the last half of the fourteenth century”,⁹ and, even if this is perhaps to be seen as more true of Tuscan painting than more generally, there was unquestionably a general turn to pattern and decorative effect in much of mid to late Trecento painting. The picture surface itself then again became more significant, and suggestions of illusion became relatively less important. At the same time, the close identification of this continuing frontal presentation of rectangular buildings with the picture surface and frame could well have prompted later developments. For the concurrence of the two could well have helped the evolution of the central point perspective which developed in the Quattrocento, as here the picture plane and the framing hypothetical “window” of Albertian artificial perspective constructions are the same.¹⁰

The continued effective use of the foreshortened frontal settings depended very much on the help of some surface detail enlivened by light and shade. While the overall frontal outline of a building, almost as an architectural elevation, is retained with no convergence, details, like window recesses arch mouldings, or projecting pilasters are foreshortened, and then are articulated with darker and lighter tones. Pietro Lorenzetti's *Flagellation* [Pl.311] in the Lower Church in Assisi has an open fronted loggia with a series of planes all parallel to the pictorial surface. Some tonal selection pushes the darker interior walls further back into the fictive space, but then both the interior wall and the outer face of the building carry decoration. Pillars or

pilasters, dentils or mouldings, together with small sculptural pieces are offered locally as frontally foreshortened components. All of these items are modelled directionally, from left to right, to provide local variations in depth which contribute to the composite sense of depth. In a broader treatment Ambrogio Lorenzetti's *City of Good Government*, [Fig.323] provides further illustration. Here, though some compositionally central buildings, to the left and above the dancing group, are shown in softened oblique form, as are some diminutive, distant and higher, structures, the great extension to the right which gave a panoramic townscape, necessitated a travelling point of view and a resort to foreshortened frontal presentation, and much of the architecture is presented in this way.¹¹ This wide array of flat frontal building elevations is enlivened by the many door and window recesses, with foreshortened jambs and arches, being modelled directionally in very emphatic contrast [Fig.325].

The quite pronounced contrast of Ambrogio's architectural detailing points to differences between the oblique and foreshortened configurations which can have an important bearing on their response to light and shade. These are most apparent where strong light and shade articulation of architectural elements is attempted. An appreciation of the effects of light on these two perspective devices, and attendant pitfalls, adds to the armoury of painter's skills, allowing further sophisticated choice and control in the mutual employment of geometric perspective and tonal rendering. Such control was only obtainable through experimentation and practice. The variables involved are readily seen if one examines the different approaches of Giotto, in the Arena Chapel, and Duccio, in the *Maestà*.

By the first decade of the Trecento both Giotto and Duccio are obviously intent on a fair measure of consistency in overall lighting direction within a scene, even if details within this are given some flexibility. Giotto in the Arena chapel has his

frescoes generally follow the light from the large west window, while Duccio's *Maestà* shows a consistent left to right incidence of illumination throughout.

For exteriors Duccio uses foreshortened frontal structures and these are modelled, as are their inhabitants, to offer consistency with his left to right sense of the incidence of light. Another part of his overall strategy has nearly all architectural exteriors in his panels viewed from the left so that the receding walls are the ones offered to the incoming light.¹² The consequences here are quite different from those arising when Giotto reaches for similar broad integration, but in the context of the softened oblique presentations which he elects to use in many of his paintings of exteriors or combined interior-exteriors.

Two points should be made before looking any further. Firstly, a reasonable assumption is made that there would be broad diffuse reflection from those wall surfaces usually depicted in pictures of the period. The materials involved would be matt, stone or brick, perhaps white washed. Polished materials, metal or marble would not feature to any extent on exteriors surfaces. Secondly the brightness perceived in viewing a matt reflecting flat surface, approximating a Lambertian Reflector, given even illumination, *is constant, independent of viewing angle* (see Chapter 1 p.53-54).

Light on foreshortened frontal buildings

In painting architectural elements for the *Maestà* Duccio's combination of foreshortened frontal setting, as viewed from the left, together with his distinct modelling of these through a consistent fall of light from the left, implies that the light incident on his buildings is considerably more than 45° away from normal to the picture plane, even while the light on foreground figures in the same scene might be

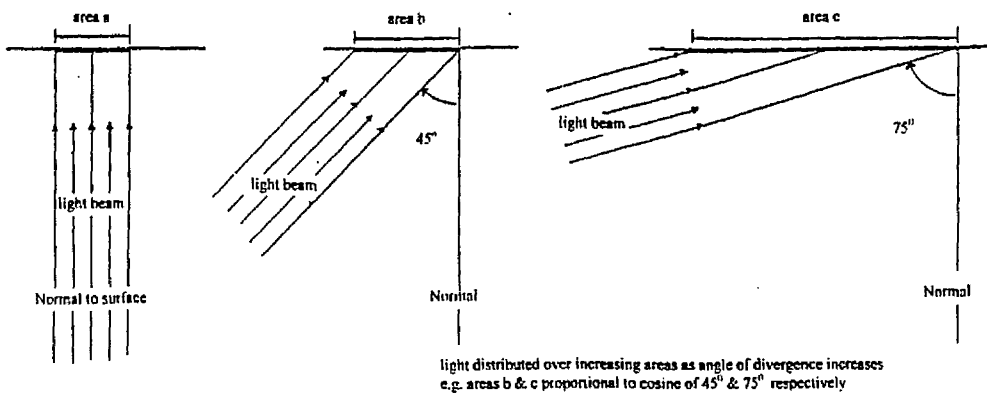


Fig. 47 : Cosine Law reduction of effectiveness of light resulting from increasingly oblique angle of illumination. (as Fig. 4)

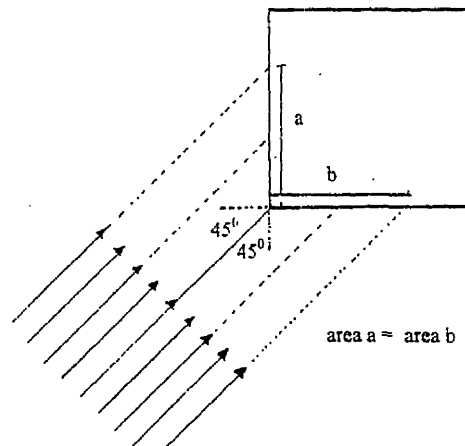


Fig. 48 : Equal light on faces of a rectangular object, light arriving at 45°.

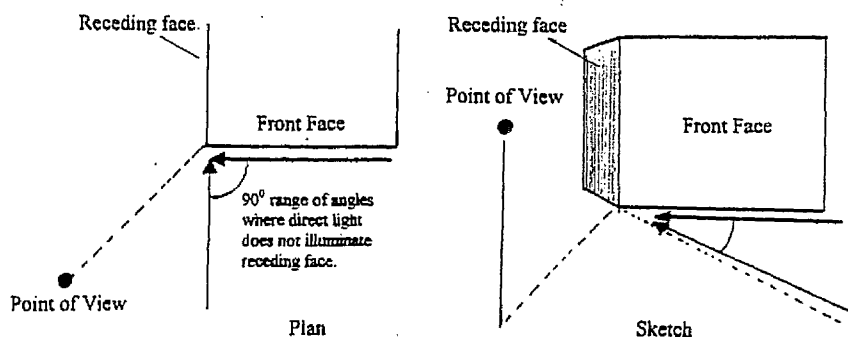


Fig 49 : Light arriving at front face of foreshortened frontal building, with sources from opposing direction relative to point of view.

assessed as relatively frontal. We can see that this very oblique angle is implied if we look, for example, at the walls of houses in the *Healing of the Blind Man*, [Pl.298]. The front faces of the buildings are shown to be darker than the receding walls. The front surfaces are accepted as parallel to the picture plane. The receding walls are then, for rectangular buildings, to be understood as being at right angles to the picture plane. The local colour and textures of the walls, if accepted as consistent in material, and with matt masonry or whitewash rather than polished surfaces, then provide a brightness level responding to *incident* light in step with a cosine law. This provides for the maximum reflected brightness of an object when light falls at right angles, that is normal, to its surface. This steadily reduces as the angle of light moves away from the normal since the diminishing area of the surface presented to the source intercepts progressively less of the light flux [Fig.47]. When the angle is such that the light arrives parallel to the surface itself, i.e. 90° to normal, the incident light then obviously becomes ineffective in providing any energy for reflection. Thus the receding walls, if brighter than those frontally offered, must have their illumination arriving at an angle closer to the normal to *their* surfaces than do the latter. The light is closer to being parallel to the picture plane than normal to it, for if it were at 45° then the walls would each receive the same amount of light and appear equally bright [Fig.48]. A much brighter receding wall then is clearly lit from a more propitious angle and the light must be incident somewhere between 45° and 90° .

Note that these circumstances arise when the incident light and point of view are on the same side and are particularly noticeable when strong contrasts of tone are involved. Conversely, where the main modelling light is to arrive from a direction on the opposite side of the subject from the point of view [Fig.49] then this illumination will not impinge on the visible receding plane over the whole 90° range of angles,

from extreme oblique to frontal. The receding plane remains in shadow and its brightness is then dependent, not on this incident light, but on the level of general ambient illumination, or *secondary* illumination in 13th & 14th century terms (see chapter 1 pp. 63-65). The distinctions here are apparent in two foreshortened frontal scenes which appear in Giotto's Arena Chapel. The house of St. Anne is depicted twice [Pls.218& 219] Both representations are identically drawn, with the foreshortened wall on the left, but, being on opposite sides of the chapel, accept their light from opposite directions. The *Birth of the Virgin*, is lit, as Duccio's, with light arriving on the receding faces, while for *The Annunciation to St Anne* it falls on the front surfaces of the building. The second picture can be read as quite frontally lit, even with the high contrast between wall surfaces tones, while the former is definitely obliquely illuminated, but with very limited separation between its tonal values. The differences in contrast between the two scenes are clear and must have been consciously controlled. The lower differentiation of tones between the two surfaces in *The Birth the Virgin* avoids any sense of too aggressively insistent orientation, whereas the higher contrast in Duccio's *Healing of the Blind Man* [Pl.298] is emphatic enough to draw attention to itself.

A difference of iconographic choice worth noting here is that Gabriel appears on the left in the *Maestà* and on the right in the Arena. So illumination and message arrive together in each case. A timely warning to remember that other factors than the mechanics of light, sight and geometry are also in play.

Light on obliquely set buildings.

While Duccio in the *Maestà* largely used frontal foreshortened presentation, or its symmetrical centralised equivalent for interiors, Giotto made much more use of the

softened oblique approach. This made it easier to offer a modelling scheme for his buildings and architectural items which could substantially indicate their solidity while appearing more compatible, in evident lighting direction, with the figures located within or in front of them. The *Presentation of The Virgin* [Pl.220] from the Arena Chapel illustrates this effectively. The rectangular temple structures, stairs pulpit, ciborium etc are presented with no surface parallel to the picture plane. Junctions of surfaces point into or out of the picture. Adjacent planes each recede to left and right allowing one or the other to be presented to a relatively frontal rather than an extremely oblique light. The angle at which an incident light can provide differential illumination on two adjacent surfaces is now much more frontal and falls closer to that which is seen to light the features of the figures involved. In consequence the figures here are seen to populate the area defined by the architectural items rather than being seen as separate items in front of an uncomfortable, if solid, structure. Even the often quite small artificial, almost stage-set, structures which are used by Giotto in the Arena chapel, for example the pulpit in *Presentation of The Virgin* [Pl.220] are given a natural solidity, and are integrated with the figures involved in a way that the larger structure in Duccio's *Healing of the Blind Man* [Pl.298] is denied.

The exploration of the combinations of directional tonal modelling with softened oblique settings continued in Giotto's circle. An appreciation of the relative contributions of directional light and shade and the geometric perspective arrangements built up with intuitive experimentation to provide useful areas of expertise. A good understanding of the effect of light's interaction on fictive structures allowed of a convincing level of illusion in paintings in S.Croce, Florence. For instance, the background to *The Resurrection of Drusiana* [Pl.251] in the Peruzzi Chapel is particularly effective, while being entirely consistent with the directional modelling

of the figures in the foreground. Maso di Banco similarly makes judicious use of tones in *St. Sylvester and the Dragon* [Pl.256] in the adjoining chapel. He superbly, if simply, gives depth to the almost understated diagonal recessions of the ruined forum. But Taddeo Gaddi in the Baroncelli Chapel perhaps relies even more on the use of light and shade to give credence to his more extravagant, and more forcefully obliquely set, *Presentation of the Virgin* [Pl.261]. Here the ambitiously complex linear exercise, which could hardly have worked in frontal foreshortened guise, would have been harder to decipher without the controlled use of tone. The modelling of the basic planes helps the scheme towards overall believable space, volume and height, even accepting the severely limited scale of the skeletal temple. The tonal articulation of the decorative details, mouldings, reliefs and architectural ornaments, adds textural depth and brings out each element's local contributions to the fictive space.

For all its advantages for effective illusion the oblique form was not adopted to any great extent, at least during the mid to late Trecento. While both geometric configurations continue through the century and on into the Quattrocento, and although distant, and smaller, background structures were reported in oblique form, it was the foreshortened frontal setting which was generally favoured for larger foreground structures.¹³ Noticeably the problem of picking the “awkward” side for lighting was generally avoided, the exposed receding face is to be found on the shadowed side of the structures as viewed.¹⁴ This in itself might not be surprising since, if we return to consider the “dark tones recede lighter ones advance” concept, then the receding walls would happily be darker than the more forward front face. In this the coincidence of the two routine procedures, foreshortened frontal presentation and recessionary light, would sit comfortably together.

While little subsequent Trecento innovation is found in Tuscan works, some quickening of interest in the empirical development of linear perspective occurred in the North East during the 1370's and 80's in the Paduan works of Avanzi, Altichiero and Giusto de'Menabuoi, the last a Florentine trained painter working in the North.¹⁵ Following a slightly earlier native Paduan painter, Guariento, they exhibit some moves towards more realistic scale, though the effects are still somewhat limited. All provided mainly frontal foreshortened arrangements for large foreground buildings, though some soft oblique structures do appear in the middle or far distance, and some very delicate touches of diagonal recession occurs in otherwise frontally presented buildings by Altichiero, as in *The Presentation in the Temple* [Pl.369]. There are, however, interesting differences in their use of light and shade, to show a continuing "visual discourse" in matters of appropriate modelling to be used in concert with linear work. Altichiero's buildings are given depth and characterised by a very precise observation and control of linear recession, particularly in the depiction of architectural detail [Pl.369]. The added shading is restrained, quite at variance with the fuller modelling he lavishes on the features or garments of his figures. Gentle pastel "washes" only lightly modulate his precisely drawn walls, leaving the drawing to provide much of any semblance of architectural depth or structural volume within his pictures. But such lower contrast for more distant architectural backgrounds [Pl.364] could be seen to provide an early sense of aerial perspective. This might gratuitously result from a wish to concentrate on the foreground figures but the effect, if not actively sought, could well have been appreciated as atmospheric distance. The Avanzi sections of the Capella di S.Giacomo murals [Pl.374] show a different priority with considerable reliance put on a full range of tones, *chiaroscuro* in fact. More convincing structural depth and volume results from the strong modelling and tonal

control of planes. Here the level of building modelling matches that of the human figures so that, though there is less focus on the latter, they are comfortably integrated into their environment. Giusto de'Menabuoi's approach is quite different. He reverts to the older code of differential shading, using it consistently to offer recession for exteriors as well as interiors. In the *Calling of St Matthew* [Pl.379] he has both foreshortened frontal and oblique buildings. These each have receding wall planes which gently darken with perceived recession. The concept of light tones advancing and dark ones retreating was clearly a practical proposition for Giusto.

Localised use of darker tones denoting recession

There are other manifestations of the idea that darker tones denoted recession. It led to some localised techniques in late 13th and 14th century painting of architecture and ones which are particularly noticeable in some complicated exteriors. If the same unmodified tone could be acceptable for the one flat wall, receding or not, there was still the need to differentiate between near and distant buildings in a complex townscape, or separate overlapping elements of a complex building. One stratagem adopted was to provide local shading for a more distant building, wall or projection just at the point where it appeared behind a nearer one. Examples of this appear in Cavallini's Sta.Maria Maggiore mosaics. In the *Annunciation* [Pl.173] the deep recesses of Mary's throne, majestically scaled as an exterior piece of architecture, are pushed back by shading, even though this contradicts the directional fall of light otherwise depicted. Another most striking example is to be found at Assisi in *St.Francis Casting out the Devils of Arezzo* [Pl.199]. The many walls of the city's buildings are piled up one behind the other in a variety of colours and tones. To suggest separation each receding wall or surface is darkened just at the point where it

emerges from behind its nearer neighbour. The adjustment is accentuated at the junction and then graded gently to leave the main surface of the further wall cleanly in its own local colour and tone. This technique is an obvious accommodation of two thoughts in conflict; the standard concept of darker tones receding and the evident contradiction of this in daylight observation. The artifice, if somewhat obvious in this instance is, in some measure, successful. It had, however, a mixed acceptance into Trecento painters' practices. The overt use of the device appears in some, but by no means all, of the paintings through the century, and carries on into the 15th century. It still appears in the works of Agnolo Gaddi and Spinello Aretino, while Gentile da Fabriano's painting can show early Quattrocento examples. Indeed, a look at Gentile's *Presentation in the Temple* [Pl.402], on the predella of the *Adoration of the Magi* altarpiece, shows it as very noticeably employed in 1423 alongside other, illusionistic, effects which clearly derived from observation. Here there is carefully realistic interior lighting for the temple while outside the shaded recessionary coding is used for spatial differentiation of its upper balustrade and also adjacent buildings. Nevertheless, this tactic was not universally used in such an overt way through the preceding 14th century. In Giotto's circle it hardly appears. It is not apparent in the Arena Chapel nor the S. Croce Chapels, though the north transept of the Lower Church in Assisi shows it employed, if in a just perceptible way. Nor do Pietro Lorenzetti or Simone Martini resort to it in any noticeable manner. In the Duccio *Maestà*, although used in a very restrained way for some interiors, this localised arbitrary shading appears on exterior architecture in only two upper panels, *The Road to Emmaus* and *The Funeral of the Virgin* [Pl.282], where the latter in effect has dark haloes round the city walls' crenellations. Significantly, the lower *Entry to Jerusalem* [Pl.288], with its complex of buildings makes no real use of it for architectural differentiation. The working

sequence suggested by J.White, where these upper panels were executed early in the process, might indicate that, in a developing practice, any overt and intrusive use of the technique was later seen as unnecessary.¹⁶ The judicious selection of colours and tones and a sophisticated appreciation of directional lighting effects were seen to provide adequate suggestions of depth.

As an illustration of such choices being made, one interesting example of the use, and non use, of this shading device is Ambrogio Lorenzetti's *Well Governed Town* [Pl.323]. The original part of the work, that generally to the right of, and including the piazza and the *jongleurs*, and painted between 1337 and 1340, is largely free of the subterfuge [Pl. 325]. The separation of the serried ranks of buildings relies more on judicious selection of tone and colour, together with linear perspective contributions involving both the subtle control of progressive diminution of scale and the disciplined employment of a mix of oblique and foreshortened frontal settings of buildings. Following some damage to the north-west corner of the room, the extreme left of the cityscape [Pl.326], and also the right-hand section of the north wall with its allegories of *Magnanimitas*, *Temperantia* and *Iusticia*, were completely repainted a few decades later.¹⁷ The techniques employed here in the repaint included the overt use of this recessional shading ploy. Its quite heavy-handed application around the details of the buildings' crenellations [Pl.327] not only copies, but exaggerates the effects seen in the Duccio *Maestà Funeral of the Virgin* [Pl.282] to give aggressively prominent silhouetting. Elsewhere efforts to separate the piled-up building elements by this device and its tapering out result in rather obvious spreading stains, both on some of the buildings and around some architectural detail. Thus even if this stratagem was avoided, or used almost imperceptibly, by major workshops in the first half of the century it was still available as an acceptable tool for some artists later in the Trecento.

Further indications of its later currency in Siena might be read into other Palazzo Pubblico paintings. *Guidoriccio da Fogliano* [Pl.349], does have touches of the ploy on background structures. Here Simone Martini's authorship was for long accepted, but this, with a c.1330 date, is now subject to debate and, as noted earlier, such shading does not appear in any other work by him.¹⁸ Different sections were subject to repainting in the 15th or 16th centuries, and in more recent 19th century restoration. The effects then could readily be a late 14th or 15th century intervention. Yet again, in the the adjacent Sala di Balia Spinello Aretino and his son Parri provided, in 1407-08, frescoes of the *Life of Alexander III* [Pl.396], where broad silhouette shadows of castellations feature.

An unhappy side-effect of the intrusive use of the foregoing ploy is seen in its conflict with another accepted concept. The local recessional shading can be interpreted as a shadow of the nearer object on the farther one. Where the forward object is a projecting roof, stair or balcony the downward shading results are compatible with the expectation that the natural incidence of light should be from above and some gratuitous soft cast shadows could be accepted. However, other shaded transitions arising from a depicted overlap do not sit so comfortably and seem to offer unnatural, upward cast, shadows. In the repainted section of the *City of Good Government* [Pl.327] a small wooden balcony carries both credible shading below its roof and less convincing effects *above* the handrail and *around* the uprights. Later examples of such mixed effectiveness appear in Gentile's *Presentation in the Temple*, on the *Adoration of the Magi* predella [Pl.402]. The shading in the loggia is readily acceptable and, indeed, if one looks closer, some depiction of shadow was clearly intended, for there are very precise cast shadows of the arch tie-bars on the wall. But, to the right, buildings apparently cast heavy shadows *upward* onto their slightly more

distant neighbours. A mixture of conventional “workshop-theory” and observation is in evidence. In the second decade of the Quattrocento, when obvious interest in illusionistic painting revived after the quiescence of the mid to late Trecento, the continuing influence of the “light advances, dark recedes” rule could still prompt arbitrary effects, even alongside the careful, and growing, attention being paid to actual lighting effects.

Elsewhere the idea that light is expected to come from above made itself felt in other ways. Straightforward manifestations appear quite widely, from the late Duecento onwards, in the representation of rusticated masonry or recessed panelling. The walls of Arezzo in the Assisi *St Francis Casting out the Devils of Arezzo* [Pl.200] display the former clearly. The straight forward rectangular blocks lend themselves to easy observation and a ready appreciation of light catching an upper edge and an illuminated side, in contrast to the darker lower edge and side. At the same time, once established the simple pattern would lend itself to easy semi-skilled reproduction by workshop juniors and would readily become a standard way of articulating a flat wall. In just the same way, the reverse form, the panelled recess, also offered a ready model to give interest to otherwise plain wall surfaces, with both its horizontal and vertical facets freely available to indicate light and shade. The *Maestà's Entry to Jerusalem* [Pl.288], or *Entombment* [Pl.293], or the *Arena Chapel Presentation of the Virgin at the Temple* [Pl.220] show its effective employment. What is entirely consistent in this, throughout the period, is that while the sides of the recesses might be given tonal treatment to indicate left or right incidence of light, or are balanced for a central illumination, upper facets are always dark and lower ones light. In this the detailed light and shade makes a contribution to the sense of vertical orientation, working with other factors, as in facial shading below eye brows and noses, or upright

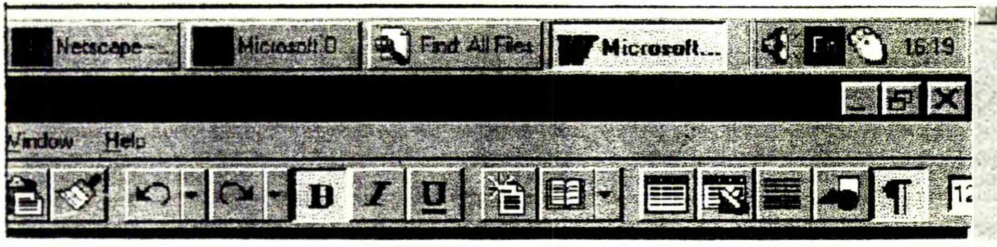


Fig. 50 : Microsoft Computer Display, Toolbar Switch Indication.



**Fig. 51 : Fictive Masonry, late 1st century B.C.
Rome, Capitoline, House of Augustus.**

poses and the vertical fall of drapery to help confirm the weight and solidity of the scene and its components.

The consistent appearance of such examples and of the universal acceptance of the idea of light from above can readily be tracked through the 14th century and on to the present day. A very mundane example of modern day usage is now found in many homes and virtually all educational establishments. The Microsoft token tool bar switches [Fig.50] on most computer screens follow the same pattern. A non-selected, and hence protruding button, is given a light toned upper and left hand edge and a darker lower and right hand edge. On key selection the tonal coding reverses, the upper and left hand edges being darker and the lower and right hand ones lighter. The intention is to suggest, first, a prominence, just like a piece of rusticated masonry, and then a depression like a Trecento recess. But if the device has 20th century currency it also has a very ancient history. It was an essential element in many of the decorative schemes of Roman wall painting. There are early hints of it in Hellenistic and Graeco-Roman painting and the illusionistic depiction of masonry blocks was a regular feature, from the early first century B.C. onwards, in the Second Pompeian Style [Fig.51].¹⁹ Precisely the same light and shade indications of projection were used for rusticated stone work as for *St. Francis Casting out the Devils of Arezzo* [Pl.200] or for Microsoft computer buttons. The upper edge and one side of the masonry block is given a highlight while the other two edges are darkened. Similarly the depiction of a recess follows the reverse procedure. With such a consistency in application at these widely different times one would expect that there would be signs of continuity from antiquity through to late medieval times. However there is little surviving sign of such regular depiction of projections or depressions in any works likely to have been available as models for artists in the late Duecento. The frescoes in S.Sylvester's

Oratory at SS.Quattro Coronati do not offer anything other than a hesitant touch of shading below a ledge, and the Sancta Sanctorum offered early signs of horizontal, but not vertical, direction in the recesses of Pope Nicholas III's chapel model [Pl.149]. The mosaics of the more recent periods offered no direct examples, but then those, certainly in Rome in the immediate preceding centuries, concentrating more on personalities, carried only limited and token architectural items. The 12th century mosaics in the Sta.Francesca Romana apse [Pl.82] show an articulation of masonry, but one adopting a different approach. The stylised indications of rustication in these are simply made by diagonals dividing the blocks into two different areas of tone, a device well used in manuscript illustration and one also found in the 12th century narrative mosaics in Sicily [Pl.88].

Among the early signs we have of re emergence of the Microsoft-like convention are the mosaics in Sta.Maria in Trastevere. It might be that their appearance results from a simple re-invention by someone, like Cavallini, interested in observing the play of light, but it is also possible that he learned of the technique from the earlier, fifth century, frescoes, some of which he repainted in S. Paolo fuori le Mura.²⁰ The 17th century watercolour copies of the fifth century and, or Cavallini frescoes, lost in a fire in 1823, show a positive interest in architectural detail. The sketch showing *Joseph and Potiphar's Wife* [Pl.171] gives a linear indication that there was panelling depicted there, and, while there are no signs of any detailed light and shade in this, the broad treatment of light and shade recorded in the copy suggests a positive awareness of lighting direction was implied and some explicitly realistic local effects would have been likely. In any event, as far as the Cavallini mosaics are concerned the decorative recesses on his architecture are all given differential shading and lighting responses,

including a sense of distinct “light from above”. The depiction of the corbels on the aedicule behind Mary in the *Adoration of the Magi* [Pls.175 &176] is a particularly involved attempt at this. The oblique setting of the linear perspective and a low angle of view offers three faces. The directional sense of light, from left to right, is shown to differentiate the two vertical surfaces in tone, while the under-surface is darker still, though somewhat broken up by its curved profile and scroll decoration. Within the flat vertical planes the recesses recorded follow the pattern of darker facets on the left and to the top, and with the right hand and lower ones darker. In this, the reaching for pattern, and the lighting logic behind it, gets too much priority and the lower lips of the recesses, particularly the curved one on the right face, are shown, when, in step with linear perspective geometry they would not be visible from the low point of view. The under-surface, with its more irregular nature in scroll decoration, clearly benefited from more direct observation in convincingly following shape and lighting response. The overall result was effective, and commendably so, within a very limited range of colours and tones of tesserae.

While artists’ sensitivity to light from above are evident in most renderings of architecture from the late Duecento onwards, there are noticeably different individual interpretations. A fine appreciation of the relationship between horizontal and vertical directional aspects of light is noticeable in Duccio’s work. In the *Entry to Jerusalem* [Pl.288] he shows darker tones rising to the crowns of his multiple arch from the shadow side and then provides a subtle gradation, downwards on the opposite curves, to gently meet and blend with the lighter lit jambs. The subtle transitions and their positioning greatly aid the sense of solid reality reached for, but not quite met, by the intuitive attempts at linear perspective and foreshortening. Ambrogio Lorenzetti takes a more simplistic approach in this particular area. In articulating window and door

recesses for *The City of Good Government*, [Pl.324] he picks out the jambs and facings using strong light tones to contrast these with the even base tone of the exterior wall. For the undersides of the arches, or lintels, above these a darker tone is employed. The transition between the two tones is made sharply at the springing of the arches. This abrupt effect is masked, on a number of more ornate buildings, by capitals but is patently obvious elsewhere. The later repairs and repainting of *The City of Good Government* [Pl.326 & 327] show another painter's, possibly Andrea Vanni's, approach.²¹ Here the repainted section has the jambs and arches as one undifferentiated light tone. There is no transition and no sense of top lighting even if elsewhere there are darker tones under horizontal details like string courses, or other projections.

Cityscapes and The City of Good Government

The foregoing survey has touched on aspects of the perception and reporting of light in the representation of individual parts of buildings. Some were picked from their locations within groups of buildings. Such combinations of buildings illustrate the early development of artists' approaches to the depiction of townscapes. The examples range from the rather arbitrary assembly of items signifying Rome in the background of *The Martyrdom of St Peter* in the Sancta Sanctorum [Pl.151], through the more considered version of this in Cimabue's *Italia St Mark* [Pl.161], the depiction of Arezzo in the *St. Francis Casting out the Devils of Arezzo* [Pl.199] (with its contrived shading differentiating the multiple layers of buildings), to the *Maestà's Entry to Jerusalem* [Pl.304]. These earlier urban depictions are simply aggregates of individual buildings with perhaps Duccio's *Entry to Jerusalem* approaching the first convincing pictorial suggestion of a city — due allowance being made for the

difference in scale between figures and structures. About three decades later Ambrogio Lorenzetti's frescoes in the Siena Palazzo Pubblico [Pl.323] take this genre an impressive step forward with the depiction of the *City of Good Government*.²² Here for the first time is a picture of a city itself; the human figures are but secondary illustrations. It offers the various buildings as an interrelated group with believable spatial relationships. An overall linear perspective scheme integrates the geometry of the buildings, each with its own individual oblique or foreshortened frontal depiction, into a composite whole. A common lighting plan completes this integration. The fresco is a successful Trecento attempt to offer a convincing illusionistic picture of a city, or rather some aspects of that city. Nonetheless, the lighting depiction, *as we see it today*, though it provides local semblances of reality does not offer a realistic following of natural arrangements overall. Some additional intent is then inferred.

Ambrogio's strategy in this has given many scholars considerable thought. John White, saw the illumination of the city and its adjacent *contado* as radiating out from an imagined source, centrally located within the city, just where the dancers are depicted, and looks for some conscious underlying purpose.²³ He interprets Ambrogio's presentation as a metaphorical statement of the essence of goodness and rectitude radiating out from the heart of a well governed town and conferring benefits on town and country alike. The linear perspective arrangements are seen in White's reading to offer a point of view to left and to right for a spectator positioned in the middle in the room and just opposite the piazza, which is at the notional centre of this idealised municipality.²⁴ A considered manipulation of light and shade is used to reinforce this and at the same time to describe the outward emanation of illumination and its implied beneficial effects. This light for the north of the city falls from right to left while that to the south of the central piazza falls from left to right.

White's thesis that the light deliberately comes from the centre of the city is accepted by many scholars, but others look for alternative intentions which could have a bearing on Ambrogio's rendering of light and particularly on its direction in the panorama. These look for a figurative source of illumination in the adjacent *Allegory of Good Government* on the nominal north wall.²⁵ The figure of Good Government or that of Wisdom, above the head of Justice,²⁶ have been suggested as suitable metaphorical sources of the light, as has the figure of *Peace* [Pl.330]. Indeed one theory put forward by J.Greenstein offers this figure of *Peace* as the source of both physical and intellectual illumination for the ideal city.²⁷ He offers several strands of justification for this hypothesis. One relies on the oblique lighting of the southern part of the city and the *contado*, pointing to an appropriate angle of light coming from somewhere on the north wall; as in fact do all the other proposals apart from White's. Greenstein also determined that a similarly oblique angle offered *Peace* a singular and significant point of view. Using test photographs in support he claimed to see *Peace's* hypothetical gaze, as offering "the characteristics of a true (by fourteenth century standards) perspectival view" of the frescoes on the east wall.²⁸ More interestingly his argument, which has *Peace's* gaze provide the intellectual enlightenment as well as the physical light for the city, looks to the anachronistic, or at least obsolescent, concept of the extramissive theory of vision for support. This lets him "propose that in accordance with medieval extramissive theories of vision, in which the visual ray emitted by the eye was considered (in the words of Robert Grosseteste) 'a substance shining and radiating like the sun, which, when coupled with the radiation from the exterior shining body, entirely completes vision . . . [lifting it] above nature [ie merely intromissive vision]', the Peaceful City is lit by the light of Peace's sight."²⁹

A later proposal by R. Tarr posits yet another source of light.³⁰ This he argues can be located at the shield held by the central figure in the *Allegory of Good Government* [Pl.330]. A gilded emblem of the city of Siena, with its patroness the Virgin inscribed on it, it is offered to the sunlight arriving through the window directly opposite at the south end of the room. It would then act as a “surrogate sun . . . for it seems to generate its own ‘lumen’, to reveal in the adjacent scene the benefits and amenity a city enjoys under its transcendent, or, indeed, divine, light”.³¹ In this the Virgin Mary is interpreted as the source. “It is through Her light that Siena as a civic idea illuminates the city both spiritually and actually to bring about a vision of peace through divine illumination, and this is the vision that the figure of Peace contemplates.”³² *Peace*’s view still features in this, with her sight making an active contribution, in an optical triangular relationship of city, illumination and vision. Although by the 1300s the extramission theory of vision had been superseded by that of intromission Tarr suggests that there was nonetheless an understanding that sight did have an active role to play in the mechanism of vision. This was Bacon’s theory, still current in the mid 1330’s, “of the inter-relationship between the visible power of the thing seen and the innate power of the sense of sight.”³³

Unfortunately all of these schemes, which seek to consider the illumination, both physical and metaphorical, as being from a position on the north wall are difficult to support, particularly if notice is taken of the play of light depicted in the repainted north end the City of Good Government [Pls.323 & 326]. The painted light there shines *back towards the north* and does not fall left to right, as it ought if originating from any of the hypothetical sources. Tarr noted this problematic repainted area, reflecting that, “The restorer may have taken care to follow what was there under the damage, without perhaps, paying attention to the consistency of the lighting whose

significance may have eluded him.³⁴ This possibility was not pursued any further. I believe a more serious consideration of it has important implications for any true understanding of Ambrogio's painting. But then it is not just the rendering of light and shade that must be questioned when comparing the restorer's work, in the areas clearly defined in Brandi's investigations [Pls.325], with that of Ambrogio's in the original fresco. There are a number of aspects where the restoration appears not to have followed Ambrogio's work.

It has been generally assumed that the restored work repeats the original very closely, though Gibbs has recently disproved this for the reworking on the north wall.³⁵ The assumption proves on even a superficial inspection to be suspect in a number of areas. In terms of linear perspective what Ambrogio painted in ^{the} area of the damaged section clearly was forgotten or disregarded. The quite random rise and fall of the slopes of the orthogonals in the repainted section [Pls.326 & 327] cannot be in any way equated with the consistent regularity of these elements in the original sections to the south [Pls.323 & 324] It is hardly conceivable that the forms drafted for buildings in the northern parts of the city followed work by the same artist, Ambrogio, who set out the consistent linear perspective program for the rest of the fresco scheme. Indeed, the rather chaotic jumble of buildings in the top left hand corner comes close to the earlier arbitrary aggregates of Cimabue's *Italia* or *Iudea* in Assisi. At the same time in matters of light and shade the nature of Ambrogio's execution was largely ignored. Many aspects of the work in the repainted section indicate the very different approach taken by the renovating artist. Brandi pointed to the quite different ways of working which appeared in the later painting as compared with Ambrogio's earlier manner of working.³⁶ Indeed, the more one looks at the restored areas the more obvious become the differences between the later work and the original Ambrogio treatments.

The later painter's handling of local detail is more closely pursued than in the broader rendering of the original. The handling of architectural elements is almost fussy alongside the broad restraint of the earlier work. As example, see the picking out of highlights on the roofing tiles [Pl.327]. At the same time faces are quite different. The later renderings do not match Ambrogio's depictions which are in this case more closely worked with deliberate and full tonal modelling and well placed highlights. Then there are obvious signs of awkward discontinuity when later working was clearly confused at points where it occurred alongside existing areas of fresco. An almost *cubist* melange of forms above the right end of the polygonal building might confirm such indecision, though this would take the boundary of original work and repaint further right and beyond Brandi's division, which runs with the obvious sutures in the plaster.[Pls.325 & 326]

Differences where lighting effects are involved are particularly apparent. The articulation of the window recesses is quite dissimilar. In the repaint the single light tone for the lit jambs is carried through right to the point of the arches [Pl.327], whereas the original items show an *abrupt* change, to a darker note, at the springing point of each arch [Pl.324], and the intrados is then given a noticeable shadow tone as indication of a sense of daylight coming from above. The one or two windows in the restored fresco, which exhibit the shaded side of the window recess, those on the right of the polygonal structure [Pl.326], have continuous shading rising to the tops of their arches.

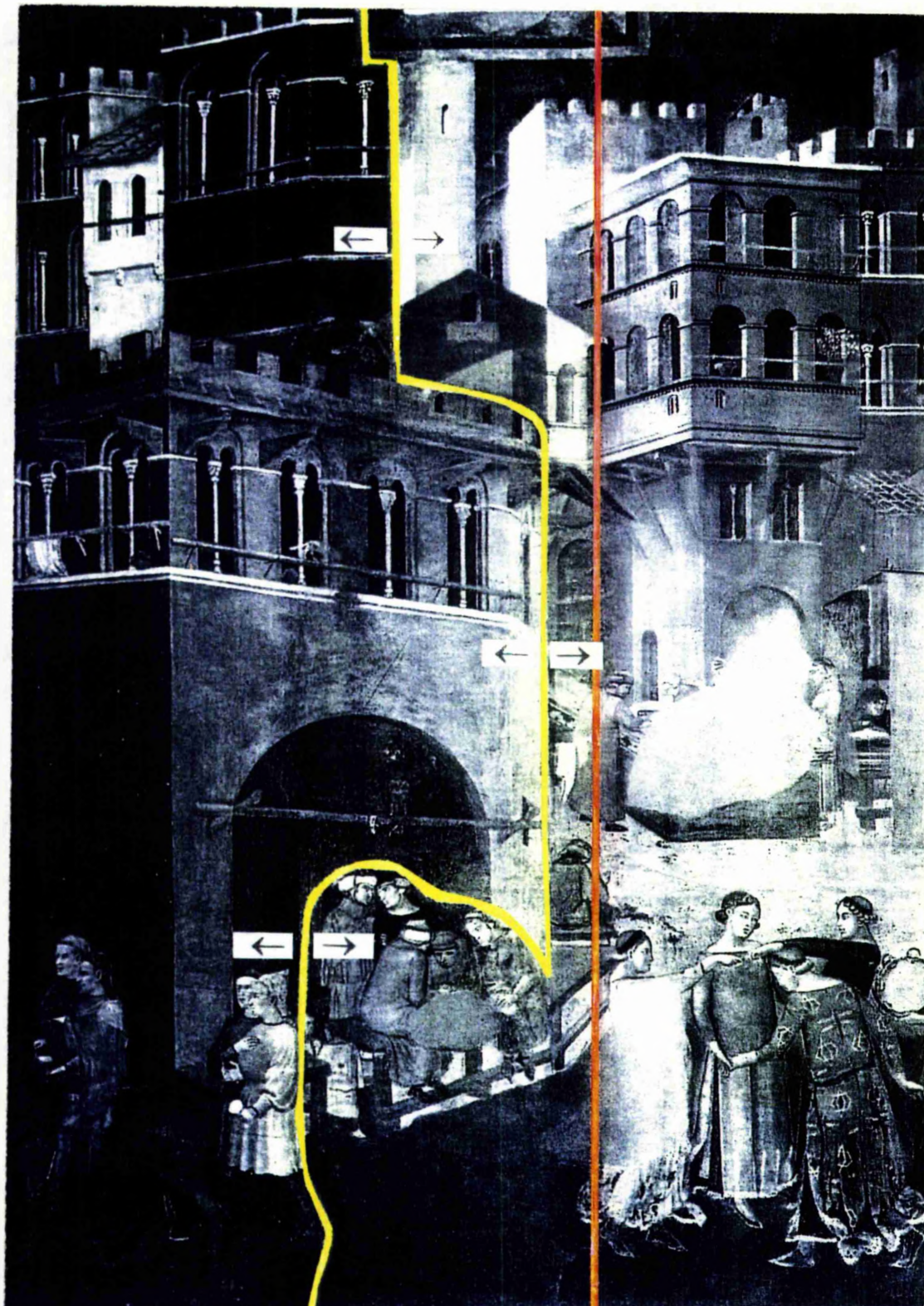
One technique to be seen prominently in the repainted areas, but never employed by Ambrogio, is the arbitrary use of localised shading to accentuate the boundaries and distance between building planes — this was discussed above (pp.298-299) with earlier examples in the Assisi *Expulsion of Devils from Arezzo* [Pl.200], and the *Maestà*

Burial of the Virgin [Pl.282 & 283]. The effects are most pronounced in the local shading round the crenellations on buildings in the repainted north of the city. This was overtly added to accentuate edges and shapes [Pl.326 & 327]. Some positive suggestion of their standing forward of the plane behind was clearly intended. Such a device is not consistent with Ambrogio's method of working. It does not appear anywhere else, and he clearly preferred to rely on judicious selection of tones and linear perspective to indicate the local spatial relationships. His painting has no prominent and arbitrary silhouettes and none of the all too obvious "spreading stains" that occur on some of the buildings in the north corner of the city and around some of the architectural detail there.

Other examples of major alterations to the nature of Ambrogio's working appear elsewhere in the Sala della Pace. The adjacent section of the north wall was also renewed [Pls.330 & 331]. Here the repainted figures of *Magnanimitas*, *Temperantia* and *Iusticia* [Pl.332] and the assembled prisoners and troops below them are depicted to a different scale from that found in the original figures further to the left. Gibbs assesses the change as making the allegoric figures 12% larger, with the others 10% larger.³⁷ The change is in some ways masked by the original having the magisterial personification of the Sienese Commune — *Ben Comun* or Good Government — as a deliberately larger, more imposing, figure for the centre piece of the tableau [Pl.330]. But once noticed this change of scale for the attendant virtues appears as an obvious and arbitrary intrusion. Besides, as Gibbs pointed out, the change of scale must imply a substantial change in the composition and its overall balance.³⁸ Further, to return to matters of light, there are other noticeable changes here in the tableaux as repainted. The modelling light for *Ben Comun*, and all characters on the left of him, comes most

emphatically from the left while that for the repainted virtues, *Magnanimitas*, *Temperantia* and *Iusticia*, is close to frontal with only the minimum of bias to the left.

More obvious signs of directional inconsistency, coinciding with restoration, are apparent in the city and *contado* on the east wall. At the extreme south end, close to the outer wall, a large repaired section sits beside the window on the right of a very obvious suture, which rises diagonally from the bottom right hand corner to the first ceiling beam [Pl.328]. A later artist in repainting followed the natural light rather than copy Ambrogio's direction, and the light falls right to left. On the other side of the visible dividing crack, the light comes from the left and the direction of the city. The change is noted and dismissed by White as "the result of damage and of restoration, as are other minor contradictions."³⁹ Further to the north, in the central area around the piazza, directional change is to be expected from the hypothesis of radiation from the heart of the city. But a detailed scrutiny of the areas of changeover shows no neat transitional pattern that might correspond with any axis of this imagined central illumination. White suggests a critical turning point for the illumination. "It shines . . . to left and right out of the city's centre. As in the case of the perspective, it is the road leading inwards from the wide space behind the dancers that forms the demarcation line." [Pl.323]⁴⁰ The background architecture does not conform to this. The polygonal building is lit from viewers' right, while above it, but still further to the left, two towers are lit from the left. The axis of any change cannot be centred at the rear corner of the piazza. Neither does directional painting of people and faces mirror itself on each side of this proposed axis. Within the open archway at the front of the polygonal building, the group of characters who are decidedly to the north of the piazza, are lit from the north, while above them and to the right the building is lit from the south [Pl.326]. These figures are clearly part of Ambrogio's original scheme. They are to



Brandi's division of
Repainted & Original Work

White's suggested turning point
of radiant light

Fig. 52: Direction of painted light in vicinity of the junction of original and repainted work in *City of Good Government*.

the right of Brandi's division separating the repaint from the earlier work [Pl.325 & Fig. 52], and, if we compare their features with those of adjacent figures, they are obviously by Ambrogio and not by the later artist.

Clearly the changeover of lighting is not to be seen turning on any hypothetical fulcrum. The transitions occur precisely at the division of original and repaired work determined by Brandi [Fig. 52]. Given this, the obvious changes to the north wall and other instances of departures from, or local denials of, Ambrogio's practices, even where surviving pieces of his work were sitting cheek by jowl with the restorer's painting as he worked, it has to be considered *that the orientation of depicted light was reversed* by the later worker. It is also highly likely that Ambrogio's original work had light falling continuously from left to right throughout the entire cycle. This would be consistent with other works by him and indeed it is worth noting here the preponderance of left to right lighting in Sienese painting. There is, for instance, Duccio's *Maestà*, Ugolino di Nerio's *Santa Croce Altarpiece*, then Pietro Lorenzetti's *Nativity of the Virgin*, all Pietro's other panel paintings, and importantly his Assisi Lower Church frescoes, where despite the geography of walls and ceiling a consistent left to right sense was maintained (see Chapter 3, p. 181) Then in Ambrogio's own works virtually all that still survive follow this pattern. For example, there is the Massa Marittima *Maestà*, the little *Maestà*, his *Presentation in the Temple*, his late *Annunciation*, or the *Allegory of Redemption*. Then there are the two landscapes, *City by the Sea* and *Castle on the Shores of a Lake*, in the Siena Pinacoteca which some attribute to Ambrogio.⁴¹ Exceptionally, the only two of Ambrogio's works which are lit right to left are his Franciscan frescoes in S.Francesco Siena. These, though, were moved from an original position originally in the Chapter House, and a following of natural light may have been intended for this initial location.

The radial use of light with a coincidental central perspectival viewpoint are not then any sophisticated compositional strategy of Ambrogio, but an accident of Trecento restoration. Before the repainting there would have been a more forthright depiction of buildings in a simple linear perspectival scheme and a more straightforward lighting programme rather than an esoteric one. The supposition that the later painters carefully followed the earlier work produced by Ambrogio in a metaphorical exercise is demonstrably implausible as are any attempts to analyse the linear perspective or the treatment of light and shade based on this assumption.

The idea that *all* of the *City of Good Government* was lit from the left, and so the north, might be seen as being compatible with the various suggestions of illumination from figures on the north wall's *Allegory of Good Government*. But the right angle separating the two walls makes this difficult to accommodate and further, as Greenstein pointed out, "neither Wisdom or any other figure in the allegorical scene glows with radiated light or illumines those near her."⁴² The signs of a light source are not in evidence. The burnished shield could have shone out, but no effects on figures around it give immediate support to this. *Ben Comun* takes his modelling light from nearly 90° to his right and not from the shield or the window which might have illuminated it. At the same time there is every reason to believe that *Magnanimitas*, *Temperantia* and *Iusticia*, now frontally illuminated, would have originally been lit obliquely from the left, as are all the other figures here and in the rest of the frescoes. The current, repainted, local direction might offer help to the shield hypothesis, but the most likely lighting arrangement would surely have had these three virtues treated just like their counterparts on *Ben Comun*'s right hand. Their illumination was from the same direction as the rest of the many objects and figures depicted on the frescoes. A

consistent left to right pattern was followed by Ambrogio and no special theory is now needed to interpret this.

Interiors

As noted earlier, from the late Duecento onwards painting practice had been moving to abandon the small token piece of architectural background and, for interiors, was looking for a semblance of enclosed space. Commonly, by the early years of the Trecento, foreshortened frontal arrangements with the expedient of the dissolved front wall, provided interior images comprising : three walls, or perhaps just two, dependent on how frontal or oblique was the point of view, a floor and now a ceiling, presented courtesy of a lower viewpoint. The *Maestà's Washing of Feet* [Pl.289] or Giotto's *Christ before Caiaphas* [Pl.230] are examples of the enclosed room effect being realised. A modification, where a view of a wider church interior was involved, as for *Jesus Disputing with the Doctors* [Pl.242], painted between 1310-17, would perhaps dispense with the side walls to offer continuing space left and right, but even here, marked by columns and vaulting, a receding, if punctured, wall is still implied. While each of the floor, wall or ceiling planes might require separate indications of decoration, texture or material these had to be accommodated in an overall scheme suggestive of depth. To offer such a semblance of space these four or five planes required handling in shading terms to positively position them relative to each other and the picture plane. In this, directional light, horizontal and vertical, and the ideas of recessionary tones all play their part. The following examples can show some approaches tried, accepted and assimilated into Trecento practice, together with some tensions arising from different ideas.

One important factor is common to most of these 14th century depictions of interiors. The idea that receding flat planes can be adequately expressed with uniform tone, as was commonly used for exteriors in Trecento and late Duecento practice (see Chapter 1 p. 70-71), was also adopted for the depiction of interior walls. This proved somewhat arbitrary for, as discussed earlier, the rule that dark tones are perceived to recede while lighter ones advance does have some justification when used in interiors (see Chapter 1 p.71-72). Dark or darker tones might be employed simply to push back anonymous or less important recesses and are seen where glimpses of interiors are secondary parts of exterior backgrounds. However, when a room or chamber was to be fully portrayed a different strategy was used to provide a sense of depth. For example, in Duccio's interiors for the *Maestà*, the distribution of wall tones is employed to offer a receding space and contained volume through directional information, rather than straightforwardly pushing the far wall back by darkening it or by providing differentials of tone along the retreating sides of the room. The arrangements here follow the left to right continuity in the chosen lighting direction for the whole *Maestà* and are executed in a disciplined three toned system. The *Washing of the Feet* panel [Pl.289] has the left wall dark green, the far wall mid-green and the third, presented to the imagined source of light from the left, is much paler still, a pale cream. Further light and shade articulation of the main background surface, the mid-green wall, with here standard Microsoft recessed panelling (see p.302 above), consistently follows the overall tonal logic. It is carried out in the same dark green and cream of the wall scheme and the panelling appears lit from a light on the upper left. The panel also carries further embellishment to add more substance to the wall. This, a complex motif, has a flower pattern within a quatrefoil and lozenge framing. It appears vertically top lit, with no sense of the overall left to right directional theme. In

this it displays an arbitrary following of the habitual expectation of light from above. The complex ceiling carving is similarly modelled, symmetrically, and as from above. But in this the execution is related to the picture surface. The associated foreshortening and low angle of view end by presenting it as lit from a relatively low frontal position. The adventurous complexity of the carvings depicted here perhaps confused matters, leading to the simplified lighting approach, for in other panels, with less complicated ceilings [Pl.280], the rafters are lit confidently left to right. Nonetheless, alongside the carved ceiling its supporting corbels have their various facets locally modelled, left to right, in concert with the walls. In all of this none of the various planes here show signs of overall recessionary shading *across* their surfaces. This is true for ceilings and walls in all *Maestà* panels. One or two show traces of graded shading on floors but only one, *The Wedding at Cana* [Pl.297], displays it to any noticeable effect. The “light tones advance dark ones retreat” rule was not, then, one followed by Duccio for interiors. It took second place to directional effects in his description of an enclosed chamber. The suggestion of top lighting appearing on the wall decoration in this example is not an isolated one. Such effects appear generally, as might be illustrated in all six scenes set in Pilate’s Palace [Pl.292]. The frieze and decorative roundels there, presumably turned out in a repetitive volume production workshop way, are all modelled with a sense of their illumination being directly overhead, despite their very obvious position under an enclosed ceiling which must preclude such a light.

A first glance at Giotto’s paintings in the Arena Chapel, might suggest that here we do find recessionary shadings. But a closer inspection, shows the walls have no gradation of tone to imply recession as such. Most of the modulations of tone are seen to be more consistent with soft penumbral ceiling or roof shadows, rather than any

incremental reduction with perceived distance. This is apparent in *The Annunciation to St. Anne* [Pl.21⁹§] where even the tapering shadows in the entrance porch can be seen to follow from the over-hanging balcony and the diagonal of the staircase.

Note that if we wish to compare the interior and exterior, here, in matters of observed reality the shadow below the stair might be justified as resulting from natural light from the sky above, but the general interior shadows, or lighting pattern shown would not result from actual interior circumstances. The light spreading up from a table-lamp, or a low window or door would not provide the penumbral pattern we see here or in other Arena interiors like the temple in *Prayer for the Flowering of the Branches* [Pl.222]. The upper shadow distributions are more in keeping with a situation where the fiction of the removed front wall has been accepted as real and in effect an external light is illuminating an open fronted shed.

Another obvious example of graded shading appears in three different Arena fresco sections, but here it is used consciously and effectively to produce an impression, not of a receding wall but of a curved one. This device appears in the three Temple scenes concerning the Virgin's Marriage and preceding events [Pl.222]. It serves to describe the shape of the apse wall behind the Temple's altar. But noticeably it does not do so by offering the deepest part of the recess as the darkest tone, for here, too, a directional plan is followed. The tonal distribution reports what is an attached shadow, generated by the fall of light from the left, and, with carefully graded shading, credibly follows it round the concave profile. The degree of control is evident if one compares the profiled variation of tone with the slow linear tapering of the soft penumbra effect on the flat wall above the apse's arch. The graded tones of the soft ceiling speak of a plane surface, while the apse wall is positively curving away from us. In this it complements the linear perspective statement of a foreshortened

curve of string course at the base of the semi-dome. What is also clear is that originally this effective modulation of tones extended up into the dome, to work with the linear definition of stylised coffering in describing the complex inner curvature there.

Unfortunately the dome was blue and, along with the other *a secco* blues of the Arena frescoes, it has suffered over the years and there now just a hint of this piece of exceptional craftsmanship.

There is a fresco in the Arena chapel where some recessional shading appears and in the process provides the artist with unresolved complications. *The Wedding at Cana* [Pl.224] generally follows the cycle's directional scheme. The left wall is a little darker than the centre one while the right is correspondingly lighter. Each is essentially flatly painted at a lower level and variations are reserved for the upper stretches where the gently deepening tones describe the soft shadow of the fretted wood-work canopy above. It is on this wooden canopy decoration that a hint of shaded recession does occur and present some problems. The two side panels of this, which lead into the room and are aligned with the side walls, each have a common discernible lightening at their outer edges, while the distant corners are dropped in tone to match that of the panel above the back wall. Perhaps the strong pattern of the fretwork could support the gradation where the plainer walls could not, and in some ways it does mask the inconsistencies which arise. However, to follow the pattern of light employed for the walls below, the right hand receding panel should have been depicted in a lighter tone than the one across the back of the room and both still lighter than the left hand one. Inconsistencies continue in the treatment of the two short outer end panels. These are presented as equal in tone. They are on the same level, in a picture plane sense, at the front face of the image and seen as coincident with the real wall. So, with their having become almost part of the framing of the picture, rather

than a part of its fictive content, such tonal symmetry is understandable. But, if a suitably bright panel, fitting the directional plan of the lower walls, was then to adjoin a similarly light toned end panel on the top right, it would have flattened out the implied angle and reduced the sense of recession at this point. Thus the darkening of the receding panel here provides a local solution, but in the process contradicts the overall strategy. The compromise leaves us with a hybrid, having directional treatment of the main lower part of the scene and above this a more centralised lighting pattern with tones gently darkening symmetrically as the side panels retreat into the image. It also produces an inconsistency where the right side of the canopy is now incongruously lit from the right, totally at variance with the general logic, not only of this scene, but also with the overall established strategy following light from the west window. One further maverick piece of lighting detail occurs in this scene. Intriguingly, the brackets, in particular the nearest pair, which support the canopy are highlighted to suggest some illumination from low within the room. Perhaps this is just poetic license, but it could have been an interesting experiment which had relevance for the adventurous interior lighting in the lower, and presumably later, *Christ before Caiaphas* fresco [Pl.230],⁴³ which will be discussed separately (see chapter 8 pp.387-390).

A common directional approach is then seen in the works of both Giotto and Duccio with the former also employing the ceiling penumbra to add some vertical orientation to his interiors. These soft ceiling shadows continue in the work of Giotto's circle and followers, as in the north transept frescoes of S. Francesco Lower Church, [Pl.242] or in Taddeo Gaddi's work. Some painters like Pietro Lorenzetti appear not to have made any use of them while other painters did pick up the stratagem but with somewhat less emphasis. Ambrogio Lorenzetti provides an interior in his 1342

Presentation in the Temple. [Pl.334] where the soft penumbrae appear but are only very delicately observed. In this panel a satisfying effect of interior depth is achieved, helped, in part, by strategically using the idea of darkening tonal recession, though again gradations along each particular wall element are avoided. In alliance with the sophisticated geometry of his experimental linear perspective, a central recession to a vanishing axis, zones, or layers, of deepening tone push back the interior of the temple to tell of an interior depth which had not been realised in painting before. Within this overall scheme of recession the tonal values of planes in both the middle-ground and the deeper background also conform broadly to a directional plan, consistent with the lighting established for the foreground tableaux of figures. To follow the left to right lighting configuration the corresponding vertical surfaces on each side of, and across, the various building bays are distinctly differentiated. This is as for Duccio's interiors above, but here more detailed provision of rebates and mouldings, with their local light and shade carefully and consistently picked out, helps to enliven the effect. A sense of light from above is also carried through here. While, as already noted, Giotto-like penumbrae are barely acknowledged the undersides of arches and recesses carry distinct shading. This is flatly applied and, just as for Ambrogio's exterior working (see p.305-306 above), no subtle adjustment blending shades occurs on the intrados or jambs of arches. However the harsh transitions which must result are largely avoided since all but two arches spring from capitals. As a result the underside of each arch is an isolated form and is painted in flat unmodulated colour. The only direct contact between an arch and its lighter, more illuminated support is found on the right aisle arch, above the Prophetess Anna. The abrupt transition is very obvious here. Such detailed clashes serve to draw attention to the way that part of the illusion of depth in the background of this work is achieved using flat planes of colour. Tonal variations

do not take place within each plain architectural unit. There are only one or two exceptions to this. The local details of capitals and bases and the round pillars are fully modelled. Then the floor, with its tile pattern converging to a point behind the altar, is judiciously shaded to enhance distance in a strict adherence to the recessionary tonal rule of thumb and an internal perspective. Unfortunately, while this shading is nicely judged, the over zealous linear convergence hinders the illusion, making giants of the figures behind the altar, particularly that of the priest.

Some hints of interest in graduated shading of receding walls appear in Guariento's work later in the century. Besides following Giotto's example in, first, soft upper ceiling shadows, and, second, a skilfully modelled apsidal recess, his *St. Augustine Receiving the Habit and His Baptism* [Pl.360] has gentle but obvious progressive reductions in tonal value along a receding wall. The tones of associated pilasters, which punctuate the wall, confirm the controlled reduction. Subsequently Giusto De'Menabuoi, in the 1370s, pursued this idea a bit further for his interiors. But his rather mechanical and doctrinaire use of it also for his exteriors (see p.298 above) suggests it is more likely he was dutifully following the "light tones advance, dark tones retreat" rule of thumb rather than any strict observation. Nevertheless, he did make very purposeful use of tonally graded walls for both exteriors and interiors. His interior effects, as in the Padua Duomo Baptistery *Annunciation* [Pl.380] were to some extent convincing. But were somewhat marred by an artificial, neutral grey and clinical appearance making them more like an exercise than any attempt at reality. . . . Certainly such endeavours, in this respect, were not followed or reflected to any noticeable extent in the paintings of Altichiero or Avanzi, his contemporaries in Padua, nor further afield in works of, say, Agnolo Gaddi, or Spinello Aretino.

Furniture

An essential element in interiors is furniture. Beds, chairs stools and cabinets can all add realistic interest to rooms in narratives, while the throne is an often necessary part of devotional works. In the main they can be seen as small scale items of architecture. Oblique and soft oblique configurations do occur, but the bulk of depictions are foreshortened frontal. Their execution in light and shade follows the procedures already examined for exterior buildings.

There is, though, one aspect where furnishings differ from the larger interior structures. The low eye level which lets us see ceilings and loses roof tops is still high enough to disclose the top surfaces of items like tables, chests, chairs, benches, or plinths. Such top surfaces are invariably treated as considerably brighter in tone than the sides. This can be justified in observation as it can arise in different ways. It can occur for full daylight exteriors with the high angle of light incident from the sky and sun providing brighter top planes. But for interiors the normally low vertical angle of incidence of light implied in the reporting of other main elements of a picture, faces and clothing, would show these horizontal surfaces to be darker than the illuminated sides, a relatively high angle, 45° being required to have them equal, and a still higher one, 60° or more, needed to change the balance sufficiently to effect any noticeable difference.⁴⁴ Stretching the point in this case, the very lowest planes in a typical Trecento interior — the upper surfaces of a plinth, footstool or lower steps of a stair way — might just be argued to appear a little brighter, or as bright as, the forward facing surfaces. But anything higher, table tops or the upper surfaces of chair arms can not be justifiably brighter. At the same time, the assumption of a relatively high interior light can, of course, alter these assessments. However, any required lamp has to be above table height, but only marginally above eye level to provide the modelling

to be seen on faces. As will be examined in chapter 8 (see p.382 ff.), any attempts at sophisticated reporting of interior lighting arrangements are found perhaps only in one or two isolated adventures in the Trecento and otherwise separate depiction of interior lighting is avoided. But, in any case, the invariable bright highlighting of the upper surfaces of the seat or arms of a throne, as illustrated in numerous enthroned Madonnas or Coronations [Pls.391 & 395] is not consistent with the angle of light reported for the figures sitting on it. The Trecento's habitual depiction of bright tops to tables and other horizontal surfaces within interiors is then most likely to be a convention borrowed from or reflecting external daylight experience. The normality of light being from above is patently incorporated into a universally observed convention, and, it must be noted, one which modern eyes have little difficulty in accepting.

The artificial or exaggerated highlighting here is, in effect, a complement to the ceiling shadowing, noted above. Both effects provide a distinct sign of vertical orientation. This visual clue, a token of gravity, helps give weight and substance, both to the object itself, and to the scene around it. The lighter top of the table in *The Wedding at Cana* [Pl.224] or the bed cover and chest in *The Nativity of the Virgin* [Pl.319] provide typical indications of Trecento usage.

One particular piece of furniture, the throne, appears frequently in 13th and 14th century devotional works. In the Duecento many of these are shown in foreshortened frontal settings. Guido da Siena's Palazzo Pubblico *Madonna and Child* or Duccio's *Rucellai Madonna* [Pl.270~~1~~], are cases in point. But in the Trecento the depiction of an enthroned Virgin and/or Christ invariably had the throne presented symmetrically and frontally. Two basically different approaches to modelling these arrangements occur.

In one, more in evidence early in the century and mainly in Sienese works, thrones were painted in quite the same positively directional, three-tone, manner we

saw being employed in Duccio's interiors (see p.317 above). Duccio's *Maestà* throne is one instance of this, and it appears in both Ambrogio and Pietro Lorenzetti Madonnas. The latter's 1340 *Madonna and Child with Angels* [Pl.317], with its exaggerated linear perspective, shows the procedure very clearly with three basic tones distributed as if for a small scale version of Duccio's three walled rooms.

An alternative approach, which more generally applied throughout the Trecento, provided a balanced, symmetrical, arrangement of tones on a throne's surfaces. This matched the typically balanced compositions involved in the many devotional works depicting an enthroned Madonna and Child with attendant saints placed evenly to each side, or the symmetrical arrangement of Christ and Mary in a Coronation of the Virgin. Late Trecento century examples by Spinello Aretino [Pl.395], Agnolo Gaddi's National Gallery *Coronation of the Virgin* [Pl.391] clearly show the nature of mirrored consistency in tonal arrangements, while Cavallini's throne for Christ in the Sta.Cecilia *Last Judgement* [Pl.180] shows an example of symmetry from the last years of the Duecento, as does the S.Cecilia Master [Pl.253] at the start of the 14th century. There is no one-sided directional distribution in these. The inner planes of the sides each have tones equally dark relative to the front surfaces. The back, though, is not given any suggestion of still darker tone, as a simple adherence to the "light tones advance, dark ones recede" coding would require. On the contrary, it takes up the same tonal value as the front surfaces. The tonal pattern corresponds basically to a realistic lighting arrangement with frontal and central illumination. The two sides are each sharply, but equally, angled away and so reflect lower, but similar amounts of light, while the forward facing planes, their incremental distances from the light being only minimally different, and both normally lit, each return virtually the same amount of light.

For later Trecento paintings a continued recourse to a balanced form might be no surprise since the inclination towards pattern and adornment rather than strict illusion and natural effect, a noticeable feature in mid to late Trecento works particularly in Tuscan painting, meant the elegantly balanced treatment was an appropriate means to such decorative ends. Indeed such appeal was clearly in evidence right into the 15th century when a symmetrically lit throne is painted in the early Masaccio 1422 San Giovenale Triptych. [Pl.403]. Conversely, the incidence of the directional schema is more in keeping with earlier 14th century trends where a naturalistic sense of light was being sought and the subject of some to experimentation. The Giotto *Ognissanti Madonna* [Pl.214] is interesting in this respect. It has a strong sense of direction even while expressed in subtly reporting a marginally off centre arrangement, with light arriving from the right, if at a shallow angle. There is some variation in tones, right to left, on the throne's planes. This appears on the insides of the armrests and their superstructures, and also for the sides of the canopy recess. But then these are, together, darker than the forward facing planes of the canopy and armrests, and these, the front surfaces of the arms and the fascia of the canopy, are shown as equally bright. In addition the darkening of the interior of the canopy recess carries a traditional suggestion of depth through lower tone, and it also has a gentle penumbral shadow to tell of the aedicule's overhang. Thus elements of different strategies appear in this serious attempt at realistic illusion. Nevertheless, the lack of influence of this sophisticated exercise in illusion is quite remarkable. Such neglect is readily seen in Taddeo Gaddi's very close copy in the c.1320-25 Castelfiorentino *Madonna* [Pl.257]. The latter is today severely cut down, but retains enough of the throne to make the comparison obvious. Taddeo ignores much of Giotto's careful exercise in the directional fall of light across the throne structure. He elects to follow the standard and

simple pattern of symmetrical shading on the throne, which happily complements a sense of frontality in his main figures, a tendency noted by Ladis.⁴⁵ In fact, all paintings of enthroned Madonnas by Taddeo Gaddi, or attributed to him, follow this balanced tones pattern.⁴⁶ But then such straightforward symmetrical renderings occur throughout Giotto's, or his followers' works. For instance, the *God Eternal* [Pl.236] on the triumphal arch of the Arena Chapel, the Stefaneschi Altarpiece [Pl.246] for St. Peter's, and the Bologna Polyptych [Pl.249] have such treatment, while Daddi's enthroned Madonnas, as that for the Orsanmichele Tabernacle [Pl.252], all offer balanced non-directional thrones.

Some later instances of directional treatments can be found in the North corresponding to some quickening, or perhaps continuing interest, in the development of realistic perspective and lighting effects. Guariento and then Altichiero show signs of such interest before Masaccio dramatically explores it in the Pisa Altarpiece of 1426 [Pl.409].

Guariento's *Coronation* [Pl.361], c.1351, for the tomb of Jacopo II da Carrara in Sant'Agostino, but now on the side wall of the Eremitani Choir,⁴⁷ has continuity of lighting direction from right to left across Christ and Mary and the ornate architectural throne. Presumably this continuity matched the natural lighting in the original setting. Such a configuration and a similarly elaborate throne was repeated by Altichiero, around 1380, when two interesting examples of his work point to the possible considerations involved in his choice of lighting tactics. He painted a *Coronation of the Virgin* in the Eremitani [Pl.362] and a similar one in the Oratorio di San Giorgio [Pl.370] at around the same time.⁴⁸ The former followed careful left to right incidence of light throughout, with the modelling for Mary, Christ and the ornate throne, including all its detailing, consistent with this. It was painted for a tomb on the side

wall of a chapel and normal natural light offered a particular lighting orientation which was followed in the painting. With donor portraits involved, members of the Dotto family being presented to the Virgin, some compromise giving a sense of actuality in this world rather than the next could well have been desired and integration with existing light helped serve this purpose. The S.Giorgio situation is different. The painting is located centrally and high above a *Crucifixion*, itself centred over an altar on the east wall of this fair sized Oratory. In this high position hosts of angels and no mortals attend Mary and Christ. Heaven is unambiguously implied and no earthly connection is needed. Besides this, normal illumination is from a round window, immediately above the fresco, and from lancet windows to each side, but lower down, so no particular directional sense is dictated by natural lighting. Free from the accidents of this world a serene balance could be depicted with bilateral symmetry providing suggestions of divine order. To do this the two figures, turning inward as compositional convention dictated, are lit from different directions, Mary from the left and Christ from the right. Such balanced individual modelling is a common arrangement in *Coronations* (see Chapter 3 pp.193 ff.), and normally the detailed modelling of each side of the picture then follows this selection of lighting for its main figure, in local continuity, as in Agnolo Gaddi's *Coronation* [Pl.391]. But Altichiero, in this instance, looks for still more sophistication in his modelling patterns, or perhaps for some feeling of light, grace and order radiating from the Holy pair. Christ's half of the throne is lit from the left and that of Mary from the right. This is very evident in the execution of the panelling and finely picked out ornamentation. Each element is executed locally in a highly illusionistic way, every bit as accurately as the Eremitani picture, but with locally implied lighting which provides the ensemble with a satisfying symmetry of shapes, tones and colours. The S.Giorgio fresco content

is very positively integrated, but not as a coherently and naturally lit scene. Just as in most other *Coronations* symmetrical balance is the over-riding aim, presumably as a token of divine planning and certainty.

A standard 14th century set of conventions in the lighting treatment of architectural elements can be recognised. With only slight variations the procedures developed by the late Duecento and early Trecento continued on through the century. Central to this was an acceptance of a directional pattern of solid unmodulated walls for both exteriors and interiors and with any graduated shading generally reserved for receding floors or, selectively, as notional soft vertical shadowing. Beyond examples of this last phenomenon few cast shadows appear. However, self shadowing was a general feature, in doors, lintels, arches etc., as token of a sensitivity to lighting being habitually expected to be from above. The same expectation meant detailed decoration was articulated as for light from above. The idea of darker tones offering distance and lighter ones proximity, was in evidence, but, with the standard use of flat tonal planes in architectural modelling, it was mainly used strategically for overall effects or very locally and arbitrarily to differentiate separate planes.

Chapter 6 Notes

- 1: White, *op.cit. (Birth and Rebirth)*, pp.26-28.
- 2: Cennini (Thompson), *op. cit.*, Ch.LXXXVII, p.57.
- 3: This is covered in a number of works particularly Richter, *Perspective in Greek Art*, London, 1970. and J.White, *Perspective in Ancient Drawing and Painting*, London, 1956. Some debate, unresolved and still continuing, centres on how close the ancient painters actually came to a coherent central point perspective procedure.
- 4: White, *op.cit. (Birth and Rebirth)*, p.28. "The emphasis on spiritual values, and the re-assertion of the plane surface ... are accompanied by the virtual disappearance of the oblique setting. ... By the mid fifth- century, whether in S. Maria Maggiore, S. Paolo fuori le Mura, or the Orthodox Baptistery at Ravenna, the foreshortened frontal setting alone is used, except in minor detail, or where the even flatter complex frontal and frontal and frontal patterns are introduced. ... Throughout the period separating the Early Christian epoch from the proto-renaissance of the late thirteenth century, there is either a complete return to frontal and complex frontal patterns, or a partial return with an intermixture of foreshortened frontal constructions."
- 5: *Ibid.*, pp.47-50, and White, *op.cit. (Lost Frescoes of S.Paolo)*, pp. 84-95. The sketches are in Cod. Barb. 4406, Vatican Library, Rome.
- 6: Theophilus (Dodwell) *op. cit.*, Ch.XVI, p.15. Having described a process of making up a range colours and tones running from dark to light it is suggested these can employed so that "round and rectangular thrones are painted, drawings/ round borders, the trunks of trees with their branches, columns, round towers, seats and whatever you want to appear round. Arches on columns in houses are also portrayed in the same way — but in one colour range so that white is on the inside and black is on the outside."
- 7: *Ibid.*, p.15, "Round towers are painted in yellow ochre in such a way that there is a white brush stroke in the middle."
- 8: Alberti (Spencer), *op.cit.*, p. 82.
- 9: White, *op.cit. (Birth and Rebirth)*, p.104.
- 10: Alberti (Spencer), *op.cit.*, p. 56, has Alberti's starting point for his central point perspective system as "a quadrangle of right angles . . . which is considered to be an open window through which I see what I want to paint."
- 11: White, *op.cit. (Art and Architecture)*, p 391 has them all as softened oblique, but this is so soft as to be non-existent. The only measurable inclination, that of the long tiled roof in the centre of the picture does not convince as being any more than a minor drawing error.
- 12: Of the *Maestà's* 23 exterior and loggia depictions, 19 have structures presented as viewed from the left, 2 from the right, (with one of these, the building in *Temptation on the Temple*, perhaps a special polygonal case), and another 2, *The Road to Emmaus* and *The Funeral of the Virgin* are somewhat random in their selection of different buildings in townscapes.
- 13: White, *op.cit. (Birth and Rebirth)*, p.104, "The concentration on a single pattern, that of oblique setting, which was seen in the work of Giotto and his most important followers, was never a feature of the minor, provincial , or derivative artists. It is likewise foreign to the majority of painters working in the second half of the fourteenth century. ... All distant towns and buildings, necessarily small in relation to the picture surface, are seen in the sharpest of oblique settings ... On

the other hand, those buildings which fill the frame, particularly in fresco painting, are presented in foreshortened frontal setting .”

- 14: Examples are: P.Lorenzetti, *Beata Umiltà Altarpiece*; Agnolo Gaddi, S.Croce frescoes *Chosroes Worshipped by his Subjects* in the Choir or *Bad Debtor* in the Castellani Chapel; Spinello Aretino, S.Miniato al Monte Sacristy frescoes; Altichiero, Oratorio di S.Giorgio Padua *St.George Drinking the Poison* , and *Presentation in the Temple*; Semitecolo *Entombment of St.Sebastian* Padua Duomo Sacristy; Guariento, *St.Augustine Receives the Habit*, Padua Eremitani Choir.
- 15: White, *op.cit.* (*Birth and Rebirth*), pp. 108-110.
- 16: White, *op.cit.* (*Duccio*), sees the large size of the *Maestà* as being much like a fresco project, requiring work on upper panels first. Subsequent assessments of developing spatial technique fit this understanding with increasingly adventurous and complex arrangements being competently handled lower in the work. Alternative readings of the work, which see separate individual developments by a number of important collaborators, follow from attempts to see the hands of Simone Martini, Pietro and Ambrogio Lorenzetti and others in the various sections of the *Maestà*. Of these J.H.Stubblebine, *Duccio di Buoninsegna and his School*, 2 vols., Princeton, 1979, Vol.I, p.32, lists his suggestions for attributions, and in pp.39-48 discusses in detail his reasons for these.
- 17: C.Brandi, “Chiarimenti sul ‘Buon Governo’ di Ambrogio Lorenzetti” , *Bolletino d’Arte*, XL (1955), p.119-123, reports on an investigation into the *Good Government* frescoes and the 14th century repairs to these. *Ibid*, p.121, he determines that the original work was carried out are between 1377 and 1340. This is documented by a number of payments, conveniently listed, *ibid*. pp.122-123. The dates for the repainting are considered, *ibid*.p.120, as possibly between 1350-60, or perhaps, *ibid*. p.121, sometime later, following possible damage resulting from civil disturbance in 1368. Norman, *op. cit.*, Vol.II, p.272, note 6, reports that further restoration was recorded in 1491 and at several other dates through to 1986-89. See R.Gibbs “In Search of Ambrogio Lorenzetti’s ‘Allegory of Justice in the Good Comune’” *Apollo*, May 1999, pp.11-16, for a recent reappraisal of Ambrogio’s original intentions as a significant work of art rather than as the philosophical and politico-historical *text* it has tended to become. Excellent illustrations are available in E.Castelnuovo,(ed) *Ambrogio Lorenzetti, Il Buon Governo* , Milan, 1995, though it should be noted that the illustration, *ibid*. p.394, purporting to show the division of earlier and later painting in the *City of Good Government* as determined by Brandi, *op cit.*, p.120 , is incorrect. The similar indication of the division in the *Allegory of Good Government* tableau, Castelnuovo, *op.cit.*, p.393, corresponds more exactly to that in Brandi, *op.cit.*, p.120.
- 18 G.Moran, ‘Novità su Simone? An Investigation regarding the Equestrian Portrait of Guidoriccio in the Siena Palazzo Pubblico’, *Paragone*, XXVIII,333 (1977), pp.81-88, questioned the accepted Simone attribution and suggested, *ibid.*, p.84, that the work was likely to have been a funeral portrait painted after Guidoriccio’s death in 1352, and clearly not by Simone, who died in Avignon 1344. Martindale, *Simone Martini*, Oxford, 1988, comments that “a considerable number of miscellaneous arguments have been brought forward ‘against’ *Guidoriccio* being from Simone’s workshop. In detail and aggregate they do not seem to be compelling.” But its technical quality he feels, *ibid.*, p.41, is “unimpressive”, it

being “a brilliant idea no more than competently executed . . . as if virtually the whole fresco has been handed over to someone else.”

- 19: Ling, *op.cit.*, p.23. “The essential characteristic of the Second Style is that it achieves the imitation of architectural forms by purely pictorial means”.
- 20: White, *op.cit. (Birth and Rebirth)*, p.48.
- 21: L.Bellosi, *Buffalmacco e il Trionfo della Morte*, Turin, 1974 pp.53-4, suggests Andrea Vanni as the artist who repainted the damaged sections.
- 22: See note 17 above for dates.
- 23: White, *op.cit. (Birth and Rebirth)*, p.96. “The final seal is set on this total radiation from the heart of the city of Good Government by the way in which the light itself flows from the glowing centre.”
- 24: *Ibid.*, p.97. In discussing the composition of the *Allegory of Bad Government* and the relationship of this with the *City of Good Government* on the opposite wall, the common viewing point is suggested as between these and is “the perspective focus of the entire fresco the spectator’s principal standpoint is the same for either side wall.” However the presentation of the buildings to the right of this point in the *City of Good Government*, and also to the left in the *Ill Governed Town and Country* on the opposite wall, offers all of them to the viewer at approximately the same angle. This is more appropriate to a travelling point of view than a fixed position.
- 25: “Nominal” for in point of fact the room is not exactly aligned north-south but skewed slightly anti-clockwise from such a positioning. For convenience the approximate indications are used.
- 26: C.Frugoni, ‘The Book of Wisdom and Lorenzetti’s frescoes in the Palazzo Pubblico at Siena’, *Journal of the Warburg and Courtauld Institutes*, XLIII, 1980, p.240. “The buildings of the busy city which occupies the right of the allegory of Good Government are illuminated from a source which is not the natural one — the single window of the Chamber — but which has to be imagined as coming from the spot occupied by Wisdom-Divine Justice .”
- 27: J.M. Greenstein, ‘The Vision of Peace : Meaning and Representation in Ambrogio Lorenzetti’s *Sala della Pace* cityscapes’, *Art History*, Vol.11, no.4, December 1988, pp.492-511.
- 28: *Ibid.*, p.497. But the photographs, *ibid.*, p.501, plates 11&12, which purport to show *Peace*’s effective view do not bear out the claims made for them. Their grossly oblique distortions do not correct the view. Indeed they make it hardly decipherable as a perspectival scheme.
- 29: *Ibid.*, p.498. However R.P.Tarr, ‘Correspondence : A Note on the Light in Ambrogio Lorenzetti’s *Peaceful City* Fresco’, *Art History*, Vol.13, no.3, September 1990, pp.387-395, in p.391, points out that the ‘extromission theory’ was no longer accepted by the 1330s and that ‘intromission theory’, with some provisions, was understood as the correct interpretation of our visual processes. Then *ibid.*, pp.392-3, he convincingly argues for the likelihood that Ambrogio would have had sufficient awareness of contemporary thought to reflect current ideas rather than outdated ones.
- 30: *Ibid.*, pp.389-390.
- 31: *Ibid.*, pp.390.
- 32: *Ibid.*, pp.391.
- 33: *Ibid.*, pp. 391-392. “According to his (Bacon’s) view, the major or minor role that it (sight) played depended on the comparative strength of the ‘species’ of the eye and the ‘species’ of the object it beheld. So, if the eye were to look at things baser

than itself, as it were the things of this world according to his view, it would impose itself upon them; if on the other hand, the eye were to look at things nobler than itself, say the things of Heaven, then they in their turn would impose themselves on it. . . . With the Sala della Pace frescoes, it might be said that the perfect gaze of Peace adds nobility to the pleasant scene taking place in the painted city, and that the nobility of that perfection of Peace, being superior to the imperfect human eye, is transmitted from the painted scene to onlooker. From what is quite clear from the fact that the Peaceful City is illuminated not by natural light but, but by the figurative light of the Virgin as patroness of the city, is that we are looking at a scene which exists as a reflection of a concept rather than as a representation of actuality.” Bacon’s bridging of the ideas of intromission and extromission to accommodated a sense that sight had an active role to play in the visual process is fully discussed in Lindberg, *op.cit.* (*Theories of Vision*), pp.114-116.

- 34: Tarr. *op.cit.*, p.394, note 3.
- 35: White, *op.cit.* (*Birth and Rebirth*), pp.93-101, discusses the *Good Government* frescoes accepting that work in the repainted sections were sufficiently close to Ambrogio’s original painting to allow his thesis of the radiation of both linear perspectival schemes and lighting effects to be observed. In *ibid.*, p.101, note 1, with respect of the reworking’s fidelity to the original painting, he feels confident that, “All the evidence seems to point to there having been no changes of a kind which would substantially affect the analyses which follow in the present study.” However Gibbs, *op.cit.* (*Allegory of Justice*), pp.11-13, demonstrated that major departures from original approaches occurred when the damaged section of north wall was restored.
- 36: Brandi, *op.cit.*, p.120, remarks on the “caratteristiche tecniche assolutamente diverse da quelle riscontrabili nelle altre parti della decorazione delle pareti.” Also, *ibid.*, p.120, the reworking was, he believed done “senza pedissequa imitazione” and was a matter of “l’approssimazione più che la fedeltà.”
- 37: Gibbs, *op.cit.* (*Allegory of Justice*), p.13.
- 38: *Ibid.*, p.12.
- 39: White, *op.cit.* (*Birth and Rebirth*), p.96.
- 40: *Ibid.*, p.96.
- 41: C.Frugoni, *Pietro and Ambrogio Lorenzetti*, Florence, 1988, pp.57-58, considers them as by Ambrogio, while noting there are others who see them as painted in the Quattrocento, with Zeri, for instance, believing them to be by Sassetta.. G.Rowley, *Ambrogio Lorenzetti*, 2 Vol., Princeton, 1958, pp.73-75 also argued for a 1400s dating.
- 42: Greenstein, *op.cit.*, p.498.
- 43: The normal fresco painting procedure had upper work completed before lower work, and *The Wedding at Cana* was on the middle register of frescoes with *Jesus before Caiaphas* on the lowest one. Tintori & Miess, *op. cit.*, p.160, found “The overlapping of the patches of intonaco prove beyond any question that on both nave walls as well as on the triumphal arch Giotto worked in the normal, and practical sequence, from above down.” However, p.184 note5 reports, as regards horizontal sequence of work in each tier, this could not be determined since borders were painted before the scenes and plaster for each the latter was cut in separately.

- 44: The situation is somewhat different and more complex for exterior scenes where the ubiquitous sky provides all-round illumination from above, in addition to, or as an alternative to, the sun.
- 45: Ladis, *op.cit.*, p.82., remarks on “a tendency ... toward frontality”, but misses the essential difference in this respect between the directional lighting of the *Ognissanti Madonna* exemplar and Gaddi’s version.
- 46: *Ibid.*, in all paintings of enthroned Madonnas in this *Catalogue Raisonné* the thrones are given symmetrical shading.
- 47: Norman, *op.cit.*, pp.158-9. Sant’Agostino was destroyed in 1819 but the Carrara tombs, and the *Coronation of the Virgin* mural associated with Jacopo II’s were transferred to the Church of the Augustinian Hermits, the Eremitani.
- 48: Richards, *op.cit.*, p.212, suggests : “A date for the Dotto frescoes which places them in the same period as S.Giorgio, no earlier than 1380, seems the most plausible.”

CHAPTER 7

LANDSCAPE

Architecture, interior or exterior, offered a chance to experiment with the representation of lighting effects in step with the lines and planes of geometric perspective. The natural landscape was not so accommodating and the organic and random nature of hills, woods and associated foliage and plants, together with the variability of natural lighting conditions presented problems in illusionistic representation. As an expedient the late 13th and early 14th century saw the establishment of a standard approach, derived from earlier stylistic patterns, which, while it was hardly illusionistic, synthesised a compromise between realistic hillsides and a symbol for rugged nature. This common approach, determined the nature of landscape depiction in the Trecento.

Historical Background

The provision of natural exteriors in painting was not a new departure in the 13th and 14th centuries, merely a partial recovery of techniques developed long before. Depiction of landscape was an established skill in ancient art. Besides featuring as background to figures in narratives it also became a genre pursued for itself at the close of the 1st century B.C. and the start of the 1st A.D., an achievement of Roman rather than of Greek painting, suggests R.Ling.¹ Examples of such activity are the mid 1st century B.C. frescoes, *Travels of Odysseus* [Pl.25], from a Villa on Rome's Esquiline, or the many murals [Pl.32], turned out, with various levels of expertise, for the walls of Pompeii. There were, too, topographical works, pictorial maps, which included landscape vignettes with local realistic intent. A surviving example is the late 2nd

century B.C. *Nile Mosaic* at Praeneste (Palestrina) [Pl.30]. But, in common with other aspects of backgrounds in image making, landscape depiction became neglected in late antiquity. The nature of the essentially religious art of succeeding periods made progressively less demands on the provision of backgrounds, particularly earthly ones, for the divine and holy characters required in its images. They largely disappear in the more formal hieratic icons or apsidal mosaics. With a concentration on succinct messages even the narratives of monumental works focused on figures. Aspects of landscape became very limited and simplified, mere tokens indicating context rather than representing it. Abbreviated stylisations of the older examples were, in the end, felt sufficient to provide any necessary contextual clues. The Sta.Maria Maggiore nave mosaics [Pl.48], 5th century A.D., have early indications of moves in this direction, showing notional plain ground lines or hills minimally stated through simple undulations. But the various mosaics of Ravenna from c.430 through to c.550, display a range of moves to schematic and condensed forms. Here the anticipation of further later simplifications is evident. No timetable of relationships is implied here, merely an indication of the spread of approaches over that century in the ebb and flow of manners of execution. The c.430-50 *Good Shepherd* [Pl.49], has both elements of realistic treatment and also signs of schematic simplification. The contrived rocky plinth, a non-natural affectation in itself, has formalised clefts giving a pattern of prismatic shapes, while the background rocks above follow more natural forms. Then the shrubs in the background display the random shapes of nature, while grassy tussocks regularly dotting the foreground are stiffly formal. For the wall mosaics of the S. Vitale Presbytery [Pl.56] c.550, in an extensive earthly background, rocky features as well as vegetation are given more generalised forms. The adjacent the apse mosaic [Pl.57], with a gold background suggesting paradise, retains the serrated pattern, seen

in *The Good Shepherd* foreground, as an edge to a flat ground plane. Some distributed tokens of neat flowers are positive indicators, labels, of nature, and four stylised streams confirm the location as paradise where “a river went out of Eden to water the garden, and from thence it was parted, and became into four heads”.² In S.Apollinare Nuovo the c.500-525 mosaics [Pl.51], showing 26 scenes in the life and passion of Christ, have 17 depicted as natural exteriors. These employ simple ground lines, and of these 14 display abbreviated indications of shrubs and knolls or undulations. There is, though, a noticeable variety in stylisation and modelling of even these few hillocks. Some are shown as lit from above, others roundly lit from the side while still others have some emphatic, in places sharply defined, highlighting on the leading edges of rugged projections. The Apollinare in Classe apse [Pl.61], just slightly later, has a plain, but extensive, green ground, as a notional meadow or forest, with a regimented array of stylised trees, plants and a regular repetition of diminutive rocky outcrops.

In subsequent centuries surviving mosaics show mainly a preference for golden backgrounds and its heavenly implication, though some occasional recourse to blue is made, particularly early in the ninth century. In these, saints and divine figures, requiring a surrounding ambience of the next world, had little or no associated contextual tokens which would speak of the natural world. Western examples of these are, from the 7th century, Sta.Agnes fuori le Mura with a gold background [Pl.63], and from the 9th century, Sta.Maria in Domnica, c.818, Sta.Prassede [Pl.67], and Sta.Cecilia in Trastevere, c.820, each with blue grounds, while S.Marco [Pl.68], c.830-40, has a gold background. All have shallow and plain green ground planes. In the east, after the end of the periods of Iconoclasm in 843, the return of figures in monumental church images sees them set in plain gold backgrounds. An early

example, now destroyed, was the *Virgin and Child* [Pl.69] in the Church of the Assumption of the Virgin, Nicea.³ From then on into the 12th century such treatment is general in any surviving formal Byzantine images of Christ and the Virgin, either alone or with royal and noble donors.

Continuity of landscape painting in manuscripts

Though monumental works neglected or avoided them depictions of landscape did not disappear. There was considerable continuity in manuscript illumination. Such illustrations tell of a reservoir of craft memory in Constantinople with obvious access to antique, Roman and Hellenistic examples. These give evidence of an availability in Constantinople of different models to aid any later revival of landscape in Byzantine paintings or mosaics. At different times works or copies of works from Constantinople, or by Byzantine trained artists, appeared in the West. This occurred, particularly after 1204 and the fall of the capital to the Franks. In these illustrations, echoes of the forms of the ancient tradition of landscape painting continued, albeit in varying degrees of stylisation, to maintain some knowledge of general forms of landscape painting and expressions of the iconography involved. Good fortune has left a chain of survivals to illustrate this continuity. A pre-Iconoclasm example is the 6th century Vienna Genesis where a picture of *Jacob Blessing the Sons of Joseph* [Pl.99] has an extensive, if crude, depiction of a landscape. The skill and finish are hardly competent in this particular illustration — there are other paintings by more polished workers in the same book — but as a rough copy it tells of the availability of a significant exemplar. A number of books, the Coronation Gospels Group, produced for Charlemagne's court by immigrant artists, either Byzantine or Byzantine trained, in the early ninth century provided further signs of a remembrance of antique skills, and

in these we have proof of first hand examples appearing in Europe.⁴ *The Four Evangelists* from the Aachen Gospels [Pl.102] have classical traits including hints of illusionistic landscape. In the late ninth century The Homilies of St Gregory Nazianzus, gives further evidence of continuing access to, and attentive following of, classical models. Its *Vision of Ezekiel* [Pl.103] displays a well modelled rugged hillside. From the 10th century the Leo Bible of c.930 and the Paris Psalter of c.950-70 show similar scenes with extended natural backgrounds. Indeed the latter shows, particularly in its archaising initial frontispiece, *David with Song* [Pl.105], some decidedly classical content and execution, “probably based on a surviving work of late antiquity.”⁵ Further examples of continuity in manuscript landscapes are seen around the start of the 11th century in the Menologion of Basil II. Here the *Baptism of Christ* [Pl.106], provides a somewhat stylised landscape context for St.John and Christ. Significantly, while it is likely to be a copy of earlier depictions, this shows what proves to be a stereotypical representation of the Baptism, and one which is closely repeated through the 12th, 13th and 14th centuries. Notable examples run, from the Palermo Palatine Chapel mosaics of c.1143-48, through Assisi in the late 1200’s, the Arena Chapel in the early 14th century, to the end of the Trecento with Niccolò di Pietro Gerini’s, 1387, *Baptism of Christ* [Pl.393]. Later in the 11th century an Octateuch of c.1050-70 demonstrates, in *God’s Covenant with Noah* [Pl.109], a still different survival of landscape. Within a framing composition of quite realistic banks of grey clouds and token suggestions of sea and a rainbow, a simple green ground extends upwards, as a meadow with formalised flowers, to rounded and roughly modelled hillocks on a distant horizon.

A mixed tradition of classical landscape being healthily maintained is evident in even these few limited survivals, which themselves can be but a small part of the vast

number of the documents produced by the sophisticated culture of Constantinople over 5 or 6 centuries. This continued maintenance or recovery of examples of landscapes, and also the skills they imply, preserved precious aspects of ancient painting. Through them some access to antique heritage was available to help, when, in due time, a turn to the depiction of the things of this world needed, among other elements in painting, some tangible indications of landscape.

Signs of revival of landscape in monumental Byzantine works.

The few indications, in surviving monumental works, of some reviving interest in landscape appear in provincial Byzantine works, or works in the provinces by Byzantine artists. These, it could be assumed, reflect metropolitan trends in revitalising landscape depiction but this is by no means certain. The continued spoliation and devastation of Constantinople has left little by way of survivals there, and of those a preponderance are of hieratically figured mosaics with plain gold backgrounds.

In Greece the mosaics at Hosios Lukas, c.1000, offer an extended hilly landscape to accommodate a cave for the *Nativity* [Pl.72], and show the shepherds on the nearby mountains. The mouth of the cave has some brightly outlined angular sharpness for the rocks on the left, while the surrounding landscape displays a variety of patterns to tell of varied terrain. Light toned and softly angular abstractions suggest rocky outcrops above Mary. To her left the hillside is articulated, rather cryptically, by multi-toned horizontal bands, perhaps to indicate some cultivated land. Still further out two softly rounded grey-green hills rise above an otherwise flat green ground plain to offer pasture for the shepherds and their flock. These are outlined by wide bands of

darker green, which also serve as crude modelling. A crowning outcrop atop these hills is given a suggestion of a rugged mountain by means of emphatically linear touches. A later, c.1100, example of *The Nativity* in the monastery church at Daphni [Pl.78], sees a more developed version of the same arrangement. It is still stylised, but while there are sharp edges to the cave mouth, elsewhere the linearly generalised shapes of hills and mounds are less arbitrary and follow more natural lines of contours. The tonal variations around these contours are more subtly made, adding a gentler modelling to these softer shapes. Only in the cave mouth are some sharper lighting effects apparent, but with gold tesserae this is not so much a matter of modelling as an indication of divine illumination and symbolic emphasis through chrysography, a device employed to effect in other mosaics at Daphni. [Pl.76].

The mid to late 1100s finds other examples of landscape treatments in the mosaics of Norman Sicily. These were carried out over a period of 50 years by both immigrant Greek artists and Sicilian workers trained by them. At different times new groups of Greek workers were called in, and brought with them, not just fresh skills, but also signs of current Byzantine thinking, if not from Constantinople itself, from other centres of Byzantine influence.⁶ Two versions of *Abraham's Sacrifice of Isaac*, one c.1150-60 from the Capella Palatina [Pl.86] and one from Monreale c.1180-90 [Pl.87], illustrate variations in approach to extended landscapes showing some ebb and flow in the pictorial rendering of nature. In the first, wide but subtly graded bands of shading on the curved shapes of the hillocks effect a broad modelling with some effective local volume implied. In this the central and right hand hillocks are treated in a quite symmetrically way, to correspond to recession, but on the distant central hill the tonal arrangements are also arranged to offer a distinct sense of directional of light. The later presentation turns away from such thoughts of modelling to a more stylised

and linearly patterned rendering, entirely consistent with a similar tendency obvious in the more ornamental, linearly complex, depiction of garments. Here the broad bands are pattern elements rather than modelling, and some regimented lines calligraphically decorate, or give textural articulation to the hillsides. A further manifestation of the leaning towards schematic patterning appears in the indications of broken bare rock. While the earlier mosaic has only a modest and curvilinearly formalised outcrop of rock in the middle distance to suggest a wilder terrain, the later one has extravagantly schematised crags as outcrops and mountain peaks. Mere tokens, these have little semblance of reality and are repeated, in the same form, as labels of mountain tops throughout the different cycles of the Monreale mosaic narrative programmes.

There is strong evidence that some Monreale workers brought their expertise and influence, in the late 12th and early 13th centuries, to mainland Italy, with traces of their work in Salerno, Sant' Angelo in Formis, Anagni, Grottaferrata and Rome.⁷ Unfortunately no monumental pictures with landscapes survive to tell of their, or other, provision of examples of natural exteriors in murals or mosaics in either Rome or the south at this time, though a clear suggestion of Monreale's singular landscape forms does appear around 1246 in SS. Quattro Coronati's Oratorio di S. Silvestro [Pl.129]. In the North, though, extant mosaics from the beginning of the 13th century tell of not just other quite varied approaches in developing Byzantine landscape working, but also offer proof of the availability of examples of these in Italy.⁸

Greek workers between 1208 and 1230 designed and set the *Agony in the Garden* mosaics [Pl.95] on the south wall of S.Marco Venice.⁹ The Garden of Gethsemane is depicted three times in this one panel to cover different narrative points. All three representations show bare rocky hillsides, quite different from the rolling hills which

had been offered in the Sicilian mosaics, but even here there are distinct variations in treatment. The left hand section, the earliest part executed, has linearly defined modelling of its slopes, crisp edges to its rocks and a crystalline treatment of its upper left peak.¹⁰ The other two hillsides offer, in rather hesitant and mixed versions, a slightly softer approach. Sitting on one common, regularly undulating, narrow green ground plane, they are aggregates of softly outlined sloping ridges. The dark internal contouring which separates each ridge is locally softened by immediately adjacent runs of mid tones. Further subtle variation in tones offers rather indeterminate internal modelling, but then each example has different isolated passages of linearly defined modelling. Both display a similar treatment of flat exposed peaks which are decidedly different from those of the first section. Avoiding any sharp rectilinear segmenting, these are indented in a more fluid and organic stylisation. All three hill-scapes have their barren slopes punctuated by stylised exotic trees and shrubs. Clearly these are provided as random tokens of nature even if the smaller plants have a sense of precise accuracy about them. With two alternative procedures offered here it is interesting to see that, about 50 years later, further mosaics, in the north atrium of San Marco [Pl.97], rejected any moves towards softer hills and the harder angular execution of the earlier Gethsemane might be seen as pushed still further into a prismatically crisp form.

Revival of Italian landscape working

Paintings of the first half to mid Duecento show the first serious signs of a re-awakening of interest in natural backgrounds by Italian artists. A number of different representations of landscape appeared then to meet a growing requirement for narrative illustration. These then offer some examples of painters current thoughts on the

depiction of natural landscape. The indications of hills are plain formalised shapes in the Bardi St. Francis Altarpiece [Pl.126] or the 1235 Berlinghieri version in Pescia [Pl.124]. These appear as a series of rounded silhouettes in echelon. There is a suggestion that they are slopes ascending over increasing distance, both through the simple occlusion of the farther and higher knolls by the nearer ones, and by gradations of tone above each junction, which make the base of each rising slope darker than its nearer neighbour. This second device is another manifestation of the concept that dark tones imply recession and brighter ones proximity, employed exactly as for the complex architectural situations discussed earlier, (see Chapter 6 p.298-299). But other considered uses of tone are apparent in these representations of hills. In the Berlinghieri panel the tops of each mound and some terrain details, gullies or the like, are highlighted with a combination of linear emphasis and graduated tone. The Bardi panel is less involved and relies more on linear touches. In this both look for some sense of modelling to add volume to their hillocks and do so not with any lateral directional sense but rather as reflecting illumination from above. Somewhat later Guido da Siena in a c.1275 linen hanging [Pl.139] has similarly shaped hills, but with a little more realistic sense of scale. These he rounds off using soft tonal gradations with little recourse to line. The distribution of the shading for each individual hillock might have implied a lateral direction for any light striking it rather than any top illumination, but the direction is not consistent for all the hills. The employment of graduated shading was simply meant to describe volume and bulk and not to report any lighting orientation. Still other works of the mid Duecento show different approaches to landscape. The c.1246 frescoes in SS. Quattro Coronati [Pl.129] have highly stylised hills with strong similarities to those of the 1180 Monreale mosaics [Pl.87]. There is no attempt to register any semblance of light and shade in the landscape elements, and

the “pineapple” topped hill is little more than a flat cipher.¹¹ Quite differently in the later c.1277-80 *Sancta Sanctorum*, *Martyrdom of St Paul* [Pl.155], a selection of hills and hillocks is combined with a mixed set of suggestions of volume and texture. These are, in the main, round topped mounds with a number of these given fissured front faces. The fissures are regular formalised indentations, some taking up a patterned form just like the stylised rocks in the *Galla Placidia Good Shepherd* [Pl.49] and offering the same local highlighting above their sharp steps. Apart from these sharper edges the shading treatments for most of the various hill elements are organised conventionally to give brightness to any prominence. So most of the individual mounds have darkened outlines to tell of their protrusion towards the viewer. Consequently it is not just the sides which are darker, for the tops, they being further into the picture, are similarly shaded lower in tone. No suggestion of top or laterally directional lighting arises from this. Elsewhere some ambivalent signs of a reporting of directional lighting might be read. On the left, an isolated crag has shading on its front surface graded as lit right to left, but with a right hand facet apparently in dark self shadow. Further there are some sharp highlights on the rock’s sloping upper surface, which seem to complement the dark shadowing. But just in front of this spur two bare rocky bluffs have darkly shaded indentations with their intervening projections seemingly modelled as lit right to left. Then, as already noted, the flat tops of these bluffs’ rocky projections are graded as lighter at the sharp front edge and as darkening with distance. A directional logic is clearly not pursued here and the unresolved directional shadings should not be read as such. Perhaps if the facets of the bluffs’ serrations, which were stylistically forced into flat planes, are seen and treated as walls then the Theophilus graded shading for buildings (see Chapter 6 p.287) could be seen to be invoked and these spurious results resulted. Apart from such arbitrary

shading the general pattern of working would seem to rely on observation of the rule that distance is to be seen in darkened tones and projection and proximity requires lighter ones.

Emergence of a standard approach to landscape

There were, then, in the 13th century a number of modes in Italian depiction of the uncultivated landscape. These followed various early precedents of stylised handling and offered in places only imprecise suggestions of volume and rudimentary depth. Towards the end of the century these gave way to the general adoption of a form of representation which must derive ultimately from some of the angular stylisations which had been recurrent, in different degrees, in Byzantine manuscript illustration over the centuries [Pl.103 & 106]. There were examples of such illustrations by Greek artists in Italy in the late Duecento. In Bologna the Gerona Master's c.1260-80 illustrations [Pl.111] displayed sharply stepped mountain sides with emphatic highlighting. Other intermediate examples may, however, have been instrumental in the form's introduction to Italy. There was the sharp angularity of the hills in mosaics [Pl.97] set c.1280 in the north atrium of S.Marco by Greek workers. But then other versions of this type of stylisation were also appearing in Byzantine paintings of the time. The 1295 wall paintings in St.Clement Ochrid [Pl.114] display a crisp prismatic rendering of hillsides : a reflection of contemporary Constantinopolitan stylisation, although no similar metropolitan examples survive from any earlier than a decade or so into the 14th century. Subsequently Eastern painting, Byzantine and its derivatives, Russian etc., conservatively followed this convention even to the present time in their icons.¹²

While the abrupt transitions of the geometric affectation suited the discrete nature of tesserae, and also the linear treatments this favoured in mosaics, they also patently appealed to painters intent on giving three-dimensional presence to natural backgrounds. The sharp angular formalisation of mountain sides, which effectively transformed the random inclines and organic curves of natural slopes into a controllable geometry, was advantageous in bringing them closer to the architectural forms which the artists were beginning to address successfully. The certainty of laying down a crisp line rather than the chasing of unpredictability in the fleeting accidents and subtle transitions of light and shade would have been a likely attraction. It allowed *disegno* to confidently underline the control of any three dimensional aspects of these elements. But it also offered some advantage to artists reaching out for representations of volume and space through simulated lighting variations, since the conversion to a more rectilinear geometry presented discrete areas for any broad tonal control, helping simplify the application of light and shade.

In the late Duecento these standard craggy hills appear in S.Francesco Assisi Upper Church nave, both in upper and lower registers. *The Arrest of Christ* [Pl.185] or the *Stigmatisation of St Francis* [Pl.207] are examples, though the now ruined Cimabue murals in the transepts and crossing show remains of still earlier instances from the 1280s. In Rome in the last years of the century Cavallini and Torriti's mosaics for Sta.Maria in Trastevere and Sta.Maria Maggiore have angularly defined hill-scapes. Cavallini interestingly shows some deliberation in his choice of approach. His *Adoration of the Magi* [Pl.175] has a rounded hill but with some sharp linear articulation of its internal contours. The *Annunciation* [Pl.173] has a very accurate copy of the indented rocky foreground noted in the 5th and 6th century mosaics in Ravenna. But his *Nativity* [Pl.174], following the now common iconography of a cave

set within a rocky hill, just as in Hosios Lukas or Daphni [Pl.79], has this hillock ruggedly defined by sharply-faceted rocks. Torriti similarly has a version of the craggy hill context for the *Nativity* cave [Pl.168], but with some added curvilinear affectation. The Assisi Upper Church has a late Duecento fresco version [Pl.186].

In their emphasising of raw nature all these offerings of rugged landscape have brutally abrupt leading edges for their rocky projections and upper plateaux. These transitions are given a stock treatment with the front corners of upper surfaces carrying a distinct highlight which tapers off along the surface as the flat surface is seen to recede into picture space. A contrived formula in modern eyes this is, as discussed in Chapter 1 pp. 75-80, in effect a conflation of two ideas; one, that distance requires darker tones and two, that light is to be seen as normally from above.

Early Trecento Developments

The sharply defined hill forms representing open landscape were a well established part of painting by the opening decades of the Trecento as Giotto's Arena chapel frescoes and Duccio's *Maestà* can demonstrate. Both exhibit hard outlines and abrupt edges, though Duccio's hills, in the main, have more finely indented rocks which, with a similarly fine observation of the standard crisp edge treatment noted above, presents a icily brittle landscape. In this, it is closer to the crisp Byzantine models which set the pattern. Indeed it is noticeable that the *Nativity* [Pl.285] and the *Adoration of the Magi* have backgrounds which exactly reproduce Byzantine forms. A direct connection between Tuscany and Byzantine pictures is evident here in Duccio's work and, indeed, there are arguments for possible Eastern travels by Duccio which would have given him close contact with Byzantine models.¹³ But, even if such landscapes are derivative, elsewhere there are signs of variation, perhaps

experimentation, in the Duccio workshop. A few scenes in the *Maestà*, *The Temptation on the Mount* for one, [Pl.296] have a softening of contour transitions, softer, that is, in a smoother run of contour line and reduced highlight emphasis.

In the Arena Chapel, while Giotto offers the same general stylisation for hilly backgrounds, this is more broadly stated, quite in step with his rounded volumetric description of figures. He presents a more robust landscape rather than the neat crispness of the *Maestà*. The hills are of a little larger scale than Duccio's and the contour steps, though still sharply drawn, are more extended. There are some signs of development, or maybe selection, in the degree of harshness pursued. It might be technical development, if one sees all of the crisper edges as appearing in upper register, and hence earlier, frescoes like *Joachim's Dream* [Pl.217], and any softening in some lower ones like *Noli Me Tangere* [Pl.235]. Alternatively, the differential could be seen as a matter of selection. We might detect in a number scenes that there is a positive focusing on the foreground figures together with a measured reduction in distracting sharp stridency in the background. Such control could, for example, be read into the *Noli Me Tangere*, [Pl.235], or *The Lamentation*, [Pl.234].

As suggested earlier the schematic nature of the stylised mountains, in offering discrete planes, or the scribing of clean lines for contour changes, could facilitate the sure application of light and shade. This is apparent in the simulation of volume in the *Maestà* and the Arena Chapel. The limited scale of painted hills, even in Giotto's frescoes, could have left these somewhat puny rocky elements as little more than nominal symbols, just flat labels. But consciously employed light and shade gave them convincing bulk, and though still clearly artificial, they have local existence and a tangible presence, as in Giotto's *Joachim's Dream*, [Pl.217] or Duccio's *Entombment* [Pl.293]. In each case the directional fall of light, which both Duccio and

Giotto report, is obviously stated. This is consistently from left to right throughout the *Maestà*, for both faces of this double sided altarpiece, but alternately, left to right on the north side of the Arena Chapel, and right to left on the south side, following the main natural illumination from a window above the west door. In both paintings the consistency matches the directional sense displayed on other elements, faces clothes and architecture, and is part of a conscious attempt to integrate all components into a coherent representation of reality. This directional depiction, through giving a semblance of bulk to the background rocks, also contributes to a sense of depth. But, unfortunately, this depth still appears quite restricted. The now solid tokens of mountain sides still appear relatively small, no more than very locally placed pieces of stage sets, and tend to generate a shallow theatrical ambience. But small size, or rather scale, would presumably have been seen as sufficient in itself for any Trecento painter thinking of simulating distance. Rudimentary linear perspective was a matter of active, if intuitive, experimentation in the late Duecento and early Trecento. With distance offering diminution, from a simplistic point of view, small scale would directly equate with such distance. But scale does not tell the whole story in pictorial illusion, and other factors, or the lack of them, contribute to the shallow pictorial depth in these early landscapes. A privileged 20th century viewpoint allows us to be aware of them.

Firstly, there is no sign of any atmospheric reduction in contrast to lighten distant dark notes, nor any blue shift, as might now be anticipated from aerial perspective (see p.72-73). Quite the opposite occurs. In looking further at nominally daylight scenes, it is clear that the idea, that light tones equate with proximity and darker ones with distance, controls any attempts to simulate distance in landscapes. If we return to the *Maestà* for an example, *The Temptation on the Mount* [Pl.296] has several ranges

of mountains and hills to indicate, in extended distance, “all the kingdoms of the world”.¹⁴ Each group of hills is individually treated, and, modelled in the standard fashion, is lit consistently from the left, though in a controlled range of tones which allowed progressive darkening of other ranges to indicate continuing distance. This stratagem of darkening the more distant mountains is specifically covered in Cennini’s *Il Libro dell’Arte*, where, in Chapter LXXXV, he advises “and the farther away you have to make the mountains look, the darker you make your colours; and the nearer you are making them seem, the lighter you make the colours.”¹⁵ Cennini claims a form of apostolic succession from Giotto as warranting some technical authority.¹⁶ It is appropriate then to look at Giotto’s own interpretation. The Arena Chapel has an intriguing example in *The Flight into Egypt* [Pl.223]. This is different from the other frescoes in the cycle in that it has two sets of background hills, presumably employed as token of the extent of the journey. They are, though, distinctly differentiated in tone. The nearer hill, as in other scenes, is brightly treated being close in tonal values to other elements of the foreground narrative. Only the *Nativity* and *Adoration of the Magi* frescoes have darker nocturnal tones for the rugged backgrounds, otherwise the general values of exterior background features, architecture or hillside are offered in relatively light tones. The farther hill of *The Flight* is distinctly darker. In the Cennini code this is to be read as distance in daylight. Alternatively, by our modern perceptions, it might offer something other than daylight, and the scene has even been interpreted by J.White as possibly showing signs of “experimenting with the symbolism and the formal possibilities of the observation of time of day”.¹⁷ He sees a symbolically poetic meaning in the atmospheric significance of the painting, considering it could symbolise the passage of the Holy Family from sombre night into hopeful morning. But then, this morning scenario would have them travelling east into

the morning sun, and, if time of day is seen to be depicted, the intention might have been an evening rather than a morning scene. Since it is painted on the south wall of the chapel, the group, as painted, are travelling to the west and towards the large west window. This window Giotto had taken as his main reference for lighting direction throughout the cycle, and, with the passing of the day, it would provide this fresco with a still more insistent evening ambience. In this respect we could fancifully accept the lighting effect as an intentional essay by Giotto, read as an evening progress towards the west, to Egypt and into a setting sun. In practical terms, while no mention of east or west seems to appear in sources likely to guide the iconography of the *Flight*, there were maps of the period to indicate the relative orientations of Bethlehem or Jerusalem and Egypt. For example, Marino Sanuto's with the earth shown as a disc [Pl.376], has Jerusalem in Judea at its centre and other lands displayed with general accuracy of direction, if not of scale, around it. Versions of this type of map were in the hands of artists to provide, for instance, the Ambrogio Lorenzetti 1344 *Mappamundo* for the Palazzo Pubblico in Siena,¹⁸ or later in the century an image of the world in Giusto de'Menabuoi's *Creation of the World* in the Padua Duomo Baptistry [Pl.377]. But really the most likely reading of Giotto's *Flight into Egypt* involves the simple acceptance of Cennini's working. The distant hill is darker than the nearer one and the progression left to right follows the pattern of all other action or movement in the cycle.¹⁹ But that said, Giotto's *Flight into Egypt* might have other claims to be experimental.

A second factor, helpful in suggesting the perception of depth, but, like aerial perspective, also largely unknown to Trecento painting, is the matter of differential sharpness between foreground and more distant background elements. The ability of our eyes and visual system to resolve fine detail, visual acuity, is limited.²⁰

Consequently with increasing distance detail becomes progressively indistinct. A comparison of Giotto's hills in the *Flight into Egypt* suggests that here there might be a precocious attempt to record Giotto's intuitive appreciation of such an effect and his employment of it to enhance pictorial depth. The farther hill is more softly outlined than the foreground one. Then, unlike nearly every other hill depicted in the 14th century, it has soft modulations of tone rather than sharp detailing. This patently deliberate restraining of clarity differentiates the two hills and implies separation in distance with its blurred and curtailed contrasts. It can be noted that such differentiation also parallels a physical feature used to effect in modern photography. Making use of limitations in the focusing of lenses, restricted *depth of field* in an optical system allows selective focusing at different distances. This allows for concentration of sharpness on one plane with respect to others. In this, while Giotto would have arrived at his experimental graded distinction of softness not through theory, but empirically and intuitively through observation, he precociously anticipates consequences in visual perception of phenomena only vaguely appreciated by his contemporary scholars.²¹ But then there might have been at least some knowledge and understanding of such current theories by Giotto. We might see this when the pursuit of reduced clarity and distant contrast was taken too far in one particular respect. The softer overall treatment and modelling of details on the far hill leaves it flatly described. This could point to an awareness and simplistic application, or testing, of yet another aspect of contemporary optical theory. In Pecham's *Perspectiva Communis* a book, available and studied in Padua University at the start of the Trecento, it is pointed out that at considerable distance all objects, rounded or not, are perceived as flat.²²

General and later Trecento usage

Subsequently the depiction of natural landscape in the 14th century does not generally show any departure from the stylised rocky forms employed in the Arena Chapel or the *Maestà*. Developments are, in the main, restricted to no more than a modest softening of edges, as already seen in these paintings. It may be that this moderation can at times be read as an indication of an interest in working closer to reality and illusion, but effectively no radical change results and the essential nature of the bare hillside remains a feature of 14th century working. These forms continued through the Trecento with the broader treatment used by Giotto being that more commonly followed, though at times, and throughout the country, painters were attracted to neat and finely detailed indications of rocks, as in Guariento's *Judith and Holofernes* [Pl.359]. Employed in the main as relatively small scale elements these bare mountain-scapes seem to function more as tokens than representations of reality. But then it is perhaps too easy to consider these treatments as simply a matter of stylisation and dismiss them as such. The schematic, rather than realistic, bare and angular mountains can today appear as symbols of natural exteriors rather than illusionistic representations, but such hills might not have been felt by the artists of the Trecento to have been too far from nature. Though some would have copied other paintings directly, others no doubt, followed the practice advocated by Cennini for the effective depiction of mountains. He advises, "If you want to acquire a good style for mountains, and have them look natural, get some large stones (*pietre grandi*), rugged, and not cleaned up (*non polite*); and copy them from nature, applying the lights and the dark as your system requires."²³ The more sharply splintered stones must have been more dramatically attractive, offered interesting detail, or perhaps gave results closer to the crisp hills inherited from the Byzantine manuscript forms, for no soft

round boulders seem to appear. A continuity of soil-less rocky hillsides signifying, but not quite representing, natural backgrounds, can be tracked through the century and across Italy, as is evident in the paintings of Pietro Lorenzetti or Taddeo Gaddi, Jacopo di Cione or Vitale da Bologna, Guariento or Agnolo Gaddi, Taddeo di Bartoli or Spinello Aretino. Further, their sharp angles still are to be found well into the Quattrocento with Fra Angelico's or Benozzo Gozzoli's painting.²⁴

As noted earlier their size is one factor which helps keep these rocky symbols from being fully convincing as real hills. Only in Padua in the late 1370's and 80's with Altichiero, Avanzi and Giusto de' Menabuoi are there significant signs of any change in scale. However, Giusto's hills [Pl.378] quite mechanically repeat, almost as a regular pattern, simplistic and geometric versions of the prismatic contours with high lit edges. In consequence the artificial texture which is created contradicts any improved semblance of reality that an increase in scale might have conferred. The mechanical and linear approach which was evident, and in some ways successful, in his descriptions of architecture is not compatible with the more organic nature of landscape. Add to this a calculated and laboured darkening of any receding mountains, and the impression of an almost prosaic following of rules is unavoidable. More spirited execution is evident in Altichiero's c.1377-84 frescoes in the Oratorio di S.Giorgio. A conscious step towards convincing scale for figures in an environment, both architectural and natural, is evident and a substantial increase in the size of background hills is apparent. But, as *The Nativity*, *The Adoration of the Magi*, or *The Martyrdom of St. George* [Pl.371] show, change of scale in itself is not enough, and the rugged hillside remains essentially a manifestation of the bare rocky symbol of the past century. That it does so is all the more noticeable alongside the other successful aspects of Altichiero's striving for naturalistic depiction, namely realistic figures in

realistic garments, with buildings, impeccably drawn in an intuitive near approximation to linear perspective. A few trees, of modest size and more naturalistic foliage now punctuate it, but there is no other softening greenery. It is still predominantly bare rock even if there is some softening of its raw angles, in both line and modelling. But the softer modelling is carried out with full contrast and no atmospheric effect pushes the hillside or any parts of it into the distance. Such fully painted contrast, though standard in Trecento pictures, tends to bring the whole hill-scape forward to be just a large hillock, not a mountain, on the same pictorial plane as the foreground figures with their similar contrast ranges. It also leads as in *The Martyrdom of St George* [Pl.371] to some spatial ambiguities in the upper left middle distance, where there is a close juxtaposition of hillside and buildings. Altichiero's precisely drawn architecture, here as elsewhere, carries only modest variations in light tones which might be seen to gratuitously offer atmospheric depth. It meets and overlaps with the strongly contrasted countryside which can offer no matching sense of aerial distance. Such apparent discontinuity serves to show that the conventional rugged landscape still finds its way automatically into Trecento paintings even in the work of an adventurous and perceptive painter like Altichiero.

Plants, Foliage and Trees

The different variants of the standard rocky contexts continue as bare stony hillsides from the late Duecento right through the Trecento and are generally only softened by occasional trees, and isolated plants or flowers. The flowers and plants, are often little more than additional labels or visual footnotes, signifying nature. They make little contribution to even the most modest attempts at illusion or to light and shade effects in a painting, although some were very carefully observed botanical

miniatures [Pl.209].²⁵ Even, when later in the century, a more extensive employment of plant motifs is used, these are repetitively arrayed in patterned carpet arrangements, and the effect is more ornamental than realistic. Spinello Aretino's frescoes in San Miniato al Monte, c 1385-87 or Jacopo di Cione's 1370 San Pier Maggiore altarpiece [Pl.356] show such later effects.

The trees are more significant items, though often just as slightly bigger tokens. Where trees in leaf were pictured the paintings of the late Duecento and the Trecento illustrate that a basic approach to their depiction was universally followed. A black silhouette was laid down as a background. Then the leaves, in varied greens and yellow, and also some branches, were added on top. This procedure was subsequently reported by Cennini.²⁶ While there is still some scope in this to allow for some naturalistic presentation, many Trecento paintings show it used to generate stylised patterns of tree forms, comprising dark rounded silhouettes decorated by elegantly laid out leaves and schematised branches. But the larger scale of these trees, as opposed to the smaller herbs and flowers, makes their place and function in backgrounds somewhat ambiguous. The trees in *The Stigmatisation of St Francis* [Pl.207] in S.Francesco Assisi show some resulting, indeterminate, and so uncomfortable, usage in the late Duecento. The trees are awkwardly inconsistent in scale and seem distributed as tokens for arbitrary effect rather than located in any convincing natural positions. Nevertheless, their individual treatment shows every sign of local realistic depiction with trunks carefully modelled and leaves arranged in natural banks of foliage. Other signs of some ambivalence can be noted in the early Trecento, when trees are, variously, treated as mere symbols in a purely stylised way, or occasionally seen as real and given some realistic attention, including directional modelling of light and shade. For example, the *Maestà* has a number of trees schematically executed,

apparently just as token indicators of nature, as in the *Noli Me Tangere* or the *Arrest of Christ* [Pl.291], while in the *Entry to Jerusalem* [Pl.288], where trees are an important element in an episode, and specifically mentioned in the Gospel texts,²⁷ a more naturalistic depiction occurs. Here trees are shown in reasonable scale, and the main central one has well described branches and foliage. Trunk and branches have some distinct modelling, as does the foliage. The detailing of the leaves is deliberately arranged to provide an aggregate of light tones on the left. All combine to give a distinct directional sense in step with the rest of the picture's left to right lighting. The Arena Chapel, too, shows a higher level of interest in realistic treatment of trees in the *Entry to Jerusalem* [Pl.225] than in other scenes. There is here, though, no obvious attempt to follow the incidence of directional light on the foliage. Only the trunks of trees show directional shading. In the same way, Pietro Lorenzetti, in his S.Francesco *Entry to Jerusalem* [Pl.304], c.1317-20, essays realistic trees. He follows the organic twists and turns of trunks and branches, and arranges his leaves in believable natural groupings. Nevertheless, a sense of simplified pattern still remains for the leaves are all shown in flat characteristic shapes with not one subject to foreshortening. This, together with the contrived placing of an individual tree on the traditional barren rock-scape, leaves an impression of balance between elegant stylisation and realistic depiction. If we look in this fresco for controlled light and shade handling there are signs of a hesitant employment of a directional control of tones. The large central tree, in common with nearly all the others in the fresco cycle, has no obvious directional implications in its distribution of silvery green tones, suggesting a frontal illumination, or simply an acceptance of the convention that the lighter toned foliage would be the most prominent. But then the smaller tree on the right reflects a distinct left to right fall of light consistent with the rest of the painting. Interestingly a few years later, the

predella for Pietro's Carmine Altarpiece, c.1327-8, [Pl.316] has quite deliberate signs of directional light shown in the distribution of lighter tones in a foliage offered in a fine stippling. The fine stippling technique clearly accepts that scale makes leaf shape indeterminate. Significantly it is used also for the supporting dark background, and, in breaking up the outline of the otherwise regular shapes of the trees' greenery, moves away from the stylised rounded forms.

Apart from these signs of some earlier experimentation, and one singular departure by Ambrogio Lorenzetti to be discussed separately, the forms of trees which appear throughout the Trecento generally follow, with little variation, the more stylised patterns of the *Maestà* and the Arena Chapel. As instances, they are typically repeated in Jacopo di Cione's [Pl.356], Agnolo Gaddi's [Pl.390] or Spinello Aretino's [Pl.394] paintings later in the century. Occasional signs of directional light occur, but strictly in association with these formal patterned shapes. Taddeo Gaddi's *Annunciation to the Shepherds* [Pl.259] for instance, shows an example of such a combination. The trees have stylised shapes but are subject to highlight and shadow effects to aid a narrative concerned about illumination (see Chapter 8 pp.374 ff.). One later sign of a quite different individualistic approach to trees and foliage is to be found in the Altichiero frescoes in the Oratorio di S. Giorgio. The trees and shrubbery in *The Martyrdom of St George* [Pl.371] are given a realistic role to play in an otherwise conventional rocky landscape. They are shown as more convincingly scaled and with some vague signs of diminution to help hint at pictorial recession. Their shape is determined more naturalistically, not as a disciplined preconceived pattern. The more realistic scale means that, as Pietro Lorenzetti found earlier, individual leaf shapes cannot be discerned, and these are painted as indeterminate light toned spots. In a near pointillist fashion the aggregations of these leaf spots on dark bases, of organically

irregular shape, offer the accidents of natural bulk and form in bush and tree.

However, these variegated distributions of light toned leaves are not organised to suggest any directional fall of light, even though its immediate context, the rugged hillside, or the adjacent city and its walls, clearly obey a noticeable right to left incidence. In this the foliage matches the more frontal illumination implicit in the handling of the foreground figures.

Ambrogio Lorenzetti's *Well Governed Country*

There is one singular ⁶exception to this story of general continuity in stylised landscape depiction through the Trecento. Ambrogio Lorenzetti, as part of his *Allegories of Good and Bad Government*, painted an expansive prospect of the *contado* adjacent to his *City of Good Government* [Pl.328]. This was a radical departure in the presentation of a natural environment, but as it did not prompt any changes in works later in the century it can be looked at as an isolated, if precocious, adventure. It is a realistic interlude in the otherwise conservative continuum of schematic repetition.

That it could be different in large measure results from its basic purpose. The countryside here was not a context for figures in a narrative. Quite the reverse, it was painted for itself and the figures involved are there to add information about the land. They were adjuncts to the countryside not the other way about. In this connection it is then closer to the antique ideas represented by the Praeneste Nilotic Mosaic [Pl.30] than to any more recent works or contemporary works. This also explains some peculiarities in the scale of figures. These have been otherwise explained away by a suggestion of outward radiation of diminution from the centre of the city.²⁸ This though still leaves some contradictory discrepancies in scale, and also the problem of

recognising the different activities of the various figures involved in the healthy operation of the countryside. These figures would be reduced to “mere dots” if there was strict adherence to a diminution in step with the apparent distance required of the presentation of the landscape itself.²⁹ The figures are there as labels in the topography, to indicate rural activities, and scale was not an absolute issue where a message was to be clearly presented. Such a function of the small figures and groups, as vignettes of rural events, is underlined when it is realised that these activities happen at different periods of the year. They are a dispersed set of *Labours of the Month* intended to show a well managed countryside in all seasons.³⁰

With the countryside as the essential subject matter, schematic rendering is not appropriate and conventional rugged bare rocks are not in evidence. It also evident that full-sized nature and not Cennini’s *pietre grandi* (see above p.355) provides the models for the rounded hills, and a naturalistic treatment with a detailed representation of different aspects of the land surrounding Siena is offered. Ingeniously Ambrogio made capital of the position of a hill town. A high vantage point by the city gate allows for a panorama which conveniently spreads out the surrounding lowlands as middle ground, to give Ambrogio a near planar base for his topographical map, or as the “earliest example of extensive flat terrain in Western landscape painting”³¹ Beyond that a series of receding ranges of rolling hills, cultivated and uncultivated, gives way to more distant mountains. A sense of receding distance is carefully generated in a number of ways. There are judicious suggestions of diminution of hills, buildings, shrubs and trees and some occlusion of these to tell of valleys beyond. Then in the background there is an obvious control of proportions in the far mountains, where steeper rising peaks shows these to be taller than the nearer hills and so their smaller scale converts into distance, in effect an effective control of broad geographic texture.

These linear aspects are further augmented by a variety of controlled light and shade effects. Naturalistic modelling, consistently following the left to right directional lighting pattern established for the main part of the city, and possibly for the fresco cycle as a whole, is used to give to each hilly feature local rounded volume and with it give some implied incremental depth. This it must be noted contradicts the natural light from the window on the south wall and only a later restoration at the extreme right attempts to follow the natural window light.³² The resulting shading permits a natural local differentiation of receding hill and valley features. No adherence to conventional working, with dark as recession and light as proximity, appears in its execution. Some more distant hillsides are lighter, and some darker, than nearer neighbours at points of overlapping. Over and above such local working there is a general strategy of separating receding areas by tone, but again not in any conventionally preferred way. The immediate foreground of road and orchards, with attendant figures, is darker and has more contrast than the flat middle ground, while beyond this a still lighter band sits in front of a more conventional range of modulated darker tones. But still further away is a very significant row of hills. Here we might have expected to see the darkest line, but instead these are decidedly lighter than their nearer neighbours. This clearly offers a further departure from convention, anticipating the effects of aerial perspective. The overall result is an effective depiction of broken summer light playing capriciously on distant plains and hills. But, of course, one might also see in such a varied fabrication Ambrogio ingeniously having his cake and eating it, for he can have both some distant darker hills to meet the tenets of a conventional approach to depth and also satisfy a need to match that reality which his eyes clearly observed. But one aspect of earlier stylisation finds unmodified

employment. Here and there, where a rocky outcrop or stony bank is shown [Pl.329], the sharp highlighting of the front upper edges follows standard patterns.

The *Well Governed Countryside* by necessity of its portrayal had a variety of trees and shrubs, all more comfortably sized than the token trees normally presented in Trecento works. They were of suitable dimensions, not just to match foreground figures, but adjusted in a series of approximate scales, stepped rather than in continuous diminution, to help mark the distance of the various zones of recession. Even in the foreground the individual leaves of the trees, as perceived, were hardly large enough to be distinguishable by shape. Accepting this, Ambrogio gave shape and bulk to each tree or shrub, as a whole, while presenting the texture of foliage, by modelling in an impressionistic pointillist manner. This technique is a more developed version of the method used ten years earlier in Pietro Lorenzetti's predella for The Carmine Altarpiece c.1327-28 [Pl.316] (see above p.360). While it might be tempting to see in this some earlier collaboration by Ambrogio in his elder brother's work, the same technique remains undeveloped, to take an identical form, in Pietro's c.1340 Beata Umilità Altarpiece, and the original idea was more likely to have been Pietro's but developed by Ambrogio. Additional development shows up in the use of this textural simulation by pointillist light and shade to allow identification of the general shapes and nature of smaller but close cultivated shrubs. Still further understanding of texture and distance is obvious where, beyond the middle distance, the fine stippling ceases and trees take on a flat appearance. Even deeper into the picture the individual trees merge into unmodulated banks of distant forest or woods. This progression of reducing detail discrimination, of course, essentially follows the considerations of limited visual acuity as proposed for Giotto's distant hill in the *Flight into Egypt* (see above pp.353-354) True the effect might arise from simple careful observation, but

its wide consistent application must point to at least some shrewd appreciation, if not some serious understanding, of the phenomenon.

The Well Governed Country was painted around 1338-39, a good sixty years before *Il Libro dell'Arte* appeared. It exhibits an approach to landscape painting which is distinctly different from both the codified procedures of Cennini's handbook and from the paintings which paralleled them in the standard painted forms which were established around the turn of the Trecento, and which, despite some early experimentation, became common currency throughout the century. Ambrogio, following up earlier Trecento tentative moves towards naturalistic depiction, adventurously relies much more on observation. He turns from a repetition of established past patterns to the intelligent interpretation of visual phenomena. But unfortunately his experiment appears as an isolated excursion into realistic landscape and no further Italian artists adopt such an approach in depicting landscape until the early decades of the Quattrocento. Perhaps Altichiero's technique, in the stippled depiction of trees and shrubs noted in the *Martyrdom of St. George*, [Pl.371] (see above p.360), might have been one possible sign of interested awareness. But while similar to Ambrogio's approach, or Pietro Lorenzetti's for that matter, it is clearly an individual personal adventure. Altichiero's fresco reflects no other particular aspects of the earlier spectacularly novel landscape, and, tellingly, avoids making any directional statement with the pointillist effect. Besides no Altichiero contact direct or indirect is known with Ambrogio's work.³³

Renewed interest in illusionistic landscapes in the 15th Century.

Any sign of a serious turn from the continuity in the conventional rocky landscape forms and the stylised plant life do not become apparent until the 1420s with

Gentile da Fabriano's or Masaccio's works. But even then more conservative contemporaries like Lorenzo Monaco were following the older traditions. Gentile's 1423 *Adoration of the Magi* altarpiece [Pl.399], shows some transitional thinking or perhaps some selective choice of appropriate treatments for devotional main panel and narrative predella. The main panel shows rugged landscape, interspersed with cultivated land, and, allowing for the separate anecdotes of continuous presentation, credibly scaled and accurately detailed trees and shrubbery; the finely worked detailing being consistent with the local realism and genre interests of International Gothic traits. But the predella's *Flight into Egypt* [Pl.401] has much more naturalistic rounded countryside with a sensitive depiction of the play of morning light on it. A major contribution to the overall effect again comes from the careful control of scale, precise detailing and the accurately observed local lighting effects on the trees and shrubs which dress the landscape. Masaccio's *Tribute Money* c.1425 [Pl.406] eschews any sharply contoured rocky outcrops and provides a distant mountainous background in very credible relationship with its foreground figure action. The proportions of the high, but still rounded hills, tell of their precipitous slopes. Their volume is positively described by soft modelling which consistently follows a right to left fall of light. Apart from such subtle modelling implying distance in each case there is a tonal strategy where the progressively receding distance of several ranges of hills is suggested by atmospheric reductions in contrast and saturation. Unfortunately the detailed foliage of plants and trees has been largely lost over the years. Nevertheless, there are still sufficient remnants to give evidence, if not of lighting effects, of a naturalistic shaping of trees' foliage on naturalistic suggestions of trunks and branches, and some traces of more distant shrubs, copses or woods.

Conclusion

The depiction of landscape in the 14th century was, in general, perhaps the most stylised aspect of its painting. Despite a few experimental excursions in the first decades, and Ambrogio Lorenzetti's heroic, late 1330s, adventure in the Palazzo Pubblico, landscapes were very much a matter of a schematic background indicating, generally uncultivated, nature. Effectively ideograms or hieroglyphs writ large, the formalised shapes of bare mountains were bulked out by simulated light and shade to have a solid but artificial presence. Such emblematic form of landscape endured, with just modest variations, until the Quattrocento.

Chapter 7 Notes

- 1: Ling, *op.cit.*, p.142 . “This is one of the achievements that must be credited to the Roman age.” In support he cites Pliny, *op.cit.*, Bk.XXXV, 116-117, who writes that a first century B.C. painter, Spurius Tadius, or Studius or Ludius, the readings are uncertain, “first introduced the most attractive fashion of painting on walls with pictures of country houses and porticoes and landscape gardens, groves, woods , hills, fish-ponds, canals rivers, coasts, and whatever anybody could desire, together with various sketches of people going for a stroll or sailing in a boat or on land going to country houses riding on asses or in carriages, and also people fishing and fowling or hunting or even gathering the vintage”.
- 2: Genesis 2:10. The quotation is from the Authorised Version. The Vulgate, *Biblia Sacra Latina, ex Biblia sacra Vulgatae Editionis Sixti V et Clementis VIII*, London, 1970, is marginally different, with the location a “place of delight” and it is “paradise” being watered : “Et fulvius egrediebatur de loco voluptatis ad irrigandum paradisum, qui inde dividitur in quattuor capita.”
- 3: Rice, *op.cit.*, p.90-93. The mosaic was carried out shortly after the resolution of the iconoclastic controversy, in 843, but was lost with the destruction of the church itself in 1922.
- 4: Dodwell, *op.cit.*, p.56 , sees the classical tradition in these, and considers, “The ultimate source is the illusionistic style of Antiquity which is best known perhaps from the murals of Herculaneum,” Demus, *op.cit. (Byzantine Art)*, p.62-65 discusses the date and likely authorship. He considers them as illustrating a possible, “refreshing Hellenistic renaissance in the gap between bouts of Iconoclasm”. The first controversy ended 787 and the second started 814. The painters were Byzantine or certainly “trained where Hellenistic art was still alive” and in p.65 reaches the conclusion on grounds of, not just style but of unique aspects of painting technique that they were Byzantine.
- 5: J.Lowden, *Early Christian and Byzantine Art*, London,1997,p 207, points out that, “This looks more like an illustration to some Greek legend than to a biblical book, with its idyllic pastoral landscape, its gods and nymphs, and its Orpheus-like musician.”
- 6: See Chapter 3, pp.201-202, note 62.
- 7: Demus, *op.cit. (Mosaics of Norman Sicily)*, p.452-3; and Demus, *op.cit. (Romanesque)*, p.298; Dodwell, *op.cit.*, p.167; Oakeshott, *op. cit.*, p.377, see the work of the designer of the Grottaferrata *Pentecost* and that of Monreale as one and the same.
- 8: O.Demus, *Mosaics of San Marco, in Venice, The Thirteenth Century*, Vol.1, p.6, reports *the Agony in the Garden* is mostly as original and “one of the best preserved parts of the entire mosaic decoration of the church”.
- 9: *Ibid.*, p.14, places work on the *Agony* Panel between 1208 and 1230, and in later detail, p.207, suggests the earliest part of the *Agony* panel dates from 1215, with a second master taking a hand from 1216 until 1218, when a further change of workers takes place to finish the work.
- 10: *Ibid.*, p.7, “progress of execution was undoubtedly left to right ...”
- 11: Romanini, *op.cit.*, p.283, notes the Monreale influence appears at SS.Quattro Coronati as a quite literal copy of the mosaics, “ ne citano quasi letteralmente . . . come le tipiche montagne ondulate che terminano a scaglie di pigna. . . .”.
- 12: Grabar, *op.cit.*, p.151 sees in post 1300 Byzantine painting “a reversion to academicism, either mannered or baroque, and more in line with the traditional

procedures of Byzantine art". K. Weitzmann, *The Icon*, New York, 1982, p.9, considers this as the Palaeologan era's reaction to Western influences after the "mutual inter-penetration" of the period of the Crusader states and the Latin Empire.

- 13 F. Deuchler, *Duccio*, Milan, 1984, p.24, suggests that Duccio could well have travelled in the Eastern Mediterranean, and points to a very close correspondence between a 1300 frescoed Madonna at Asinou, Cyprus, and Duccio's *Madonna of the Franciscans* as supporting this.
- 14: *Authorised Version*, Matthew 4:8, and also Luke 4:5 "and the devil taking him up into a high mountain shewed unto him all the kingdoms of the world in a moment of time."
- 15: Cennino (Thompson), *op.cit.*, p.56., and in Italian, Cennini (Tempesti) *op.cit.*, p.81, "E quando hai a fare le montagne, che paiano più a lungi, più fai scuri i tuoi colori; e quando le fai dimostrare più appresso, fa' i colori più chiari."
- 16 Cennini (Thompson), *op.cit.*, p.2.
- 17: White, *op.cit. (Duccio)*, p.166.
- 18: Rowley, *op.cit.*, p.98, discusses the various historical references to the *Mappamundo*, but suggests Siena, rather than Jerusalem, might have been the centre in this case; Ghiberti, *op.cit.*, p.89, in relating Ambrogio's work tells of "una Cosmogrofia, cioè tutta la terra abitabile."
- 19: See Chapter 4, *Faces*, above pp. 175-176.
- 20: Visual acuity is the relative ability of the eye to resolve detail. It is usually expressed as the reciprocal of the minimum angular separation, in minutes, of two lines which are just resolvable as separate. This angle for the average human eye is accepted as one minute.
- 21: Lindberg, *op.cit. (Perspectiva Communis)*, Book 1, Proposition 63, p.141, in writing of the difficulties of distant perception Pecham states: "Moreover if the distance is immoderate, sight does not achieve full differentiation of the more remote intervening bodies because the visible species are weak on account of the distance, as is taught above in proposition 18." *Ibid.*, Proposition 18, p.95, is, "The light of a single body is stronger at a near point than at a remote point."
- 22: *Ibid.*, Book 1, Proposition 83, p.155: "since convexity and concavity can be discerned only when parts of the visible object are perceived to be unequally distant, sight must fail in the perception of sphericity when the distance is immoderately great." As regards availability of Pecham's *Perspectiva Communis* in the early 1300's, *ibid.* p.29 reports it was the "standard elementary optical text book of the late Middle Ages", and, judging by survivals, one from the 1200s, twenty nine from the 1300s, and twenty six from the 1400s, it was, in terms of the period, a widespread text. Then p.30 finds confirmation of its being a standard requirement for university work in a copy reportedly chained in the Paris Library during the early 1300s.
- 23: Cennini (Thompson), *op.cit.*, Ch.LXXXVIII, p.57. The Italian is, Cennini (Tempesti) *op.cit.*, p.83: "Se vuoi pigliare buona maniera di montagne, e che paino naturali, togli di pietre grandi che sieno scogliose e non polite; e ritra'ne del naturale, dando i lumi e scuro, secondo che la ragione t'acconsente."
- 24: White, *op.cit. (Birth and Rebirth)*, p.111, note 5, sees the "conventional rock landscape formula" as continuing on into the fourteen sixties citing Fra Filippo Lippi as well as Fra Angelico and Benozzo Gozzoli as employing it.

- 25: The isolated miniature depictions of plants and flowers are often exceedingly detailed and realistic. Those in [Pl.209] from *The Stigmatisation of St. Francis* are typical of this form which is seen throughout the Assisi frescoes.
- 26: Cennini(Tempesti) *op.cit.*, Ch.LXXXVI, p.82 writes, “metti prima il *corpo* dell’albero di nero puro, temperato, ch  in fresco mal si possono fare; e poi fa’ in grado di foglie di verde scuro, o pur di verde azzurro, ch  di verdeterra non   buono; e fa’ che le lavori bene e spesse. Poi fa’ un verde con giallorino, che sia pi  chiaro; e fa’ delle foglie meno, cominciando a ridurti a trovare delle cime. Poi tocca i chiarori delle cime pur di giallorino, e vedrai i rilievi degli  lbori e delle verdure”. Cennini (Thompson), Ch.LXXXVI p.56, translating *corpo* as trunk renders the initial step as “first lay in the *trunk* of the tree with pure black”. The subsequent passage clearly indicates that this ought to mean the mass of foliage, and virtually all examples we can find bears this out.
- 27: Apart from Luke all the Gospels note branches of trees being cut down. *Authorised Version*, Matthew 21: 8 “And a very great multitude spread their garments in the way; others cut down branches from the trees and strawed them in the way.” The Vulgate version is “Plurima autem turba straverunt vestimenta sua in via : alii autem caedebant ramos de arboribus, et sternerant in via.”
- 28: White, *op.cit.* (*Birth and Rebirth*), pp.94-95.
- 29 *Ibid.*, p.95, accepts the need for the diminution of figures not to be tied “by laws of photographic naturalism. If it were, the figures would be ants, mere dots, alive only beneath the magnifying glass of analytic scrutiny.”
- 30: Frugoni, *op.cit.* (*Lorenzetti*), p.73, points to the various labours of the month from different seasons, ploughing sowing and harvesting for example, being carried out simultaneously.
- 31: Rowley, *op.cit.*, p.120.
- 32: See Chapter 6, pp. 308-316 for the different theories concerning the orientation of light and the subsequent proposal that the depicted light was intended to fall left to right throughout. The restored area adjacent to the window is distinct and obvious[Pl.328].
- 33: Richards, *op.cit.*, pp.25-31, in discussing the formative influences appearing in Altichiero’s work concludes that these must come from Giotto, via some close followers, Maso di Banco and particularly Puccio Capanna, and, though there is no knowledge of any sojourn in Assisi, close affinities with Puccio and evident knowledge of the Giottesque works in the Lower Church seem to make this likely. Such a visit might have taken Altichiero via Siena, but this would be conjecture on top of conjecture.

CHAPTER 8

NIGHT AND ARTIFICIAL LIGHT

The depiction of night scenes presents a problem for any artist, 13th or 14th century, or 20th for that matter, seeking to give a suggestion of realism. Truth to nature in a night scene could mean a minimalist black image! Then, as now, any meaningful illustration of narrative with recognisable figures involved, required some ingenuity in providing contrived artificial lighting, some coded suggestion of moonlight, or a combination of both. Alternatively, any serious thoughts of realism might readily have been suppressed, for we must always remember another aspect of cultural continuity where strict reality could not be considered, the theatre. The drama of Greece and Rome, and any later naturally lit productions, regularly required some suspension of the audience's critical perception to let a night scene take place.¹ There the provision of nocturnal attributes like torches or lamps would be as much coded information as might be available, beyond allusions in the text, to indicate night. Such plays feature in 13th and 14th century paintings too. The depiction of some torches or candles often provided helpful clues to the time of day, or rather night. But their effects as light sources was not generally reported in any modelling within the pictures. In fact, an examination of Duecento and Trecento works depicting night scenes shows that, in all but one or two notable exceptions, no distinction in light and shade treatments was made between these and daylight scenes. The exceptions are, as in other areas, most informative. They show not just precocious experiment but give some insight into contemporary appreciations of light's effects and, in signs of compromise, the disciplines of current conventions.

Night Exteriors

The problems of depicting exterior scenes at night had to be addressed regularly, for there are several frequently depicted episodes which the written canon required to take place at night. There are, for example, the *Nativity*, the *Annunciation to the Shepherds*, the *Agony in the Garden* or the *Arrest of Christ*. A look at examples of the last by different workers can be quite instructive. Some important interpretations of this are illustrated, on panel, in the Duccio *Maestà*, [Pl.291] or Ugolino di Nerio's version from his c.1325 S.Croce altarpiece [Pl.300], while that of Giotto in the Arena Chapel [Pl.228] and Pietro Lorenzetti in the Assisi Lower Church [Pl.310] show fresco renderings. One difference between panel and fresco is important. The frescoes have a blue sky background giving them a distinct advantage over the gold backing of panel works. The polished gold leaf backgrounds present an arbitrary brighter or darker note dependant on viewing position, which, together with its local colour, might just, at times, equate with an evening sky, but certainly not a night one. Looking beyond that, the Duccio *Maestà Agony in the Garden* and *Arrest of Christ* have almost standard landscape backgrounds with little or no sign of any amendment to the distribution or levels of tonal values as otherwise seen in daylight scenes of similar geography. Their hills carry the same light upper planes as for daytime incidents and only a possible slight darkening of the side slopes of hills in Duccio's pictures might hint at night. The faces and dress of the foreground characters too, have no indication of any attempt at registering darkened circumstances. Their modelling, level of contrast and highlights are consistent with figures in daylight scenes, both exterior and interior, throughout the whole work. Ugolino's *Arrest* is perhaps even less likely to convince as taking place at night for, while his picture follows Duccio's in many ways, his lighter palette leaves his elegantly shaded faces brightly depicted in a delicately high key. Yet another factor is worth noting here. There has to be some further reservation in this reading of Ugolino's picture since the metallised helmets of his soldiers have oxidized, taking away, not just their bright metal effects, but also any possible modifying modelling glazes. We can only guess at their original contribution, but they must have

added additional light notes. Most Trecento works including Pietro Lorenzetti's and Giotto's pictures suffer in the same way (see Chapter 5 p.274-275), but exceptionally Duccio in the *Maestà*, elects to represent armour in paint rather than use real metal, although the generally brighter nature of its rendering does reflect a broader daytime light rather than showing any sign of an attempt to register the sharper spots and localised glint consistent with the more concentrated torch sources.

Frescoes might have fared somewhat better than panels with gold backgrounds, since their conventionally blue skies readily contributed a nocturnal flavour. Giotto's *Arena Arrest* [Pl.228], had this advantage, though the helpful deep blue is somewhat reduced in effect today. The lower part of the sky has lost its *a secco* azurite finish and grey fresco under-painting is exposed. This sky, gratuitously provided by conventional fresco practice, is the only background suggestion of night. Giotto concentrates purely on the human involvement in the drama and provides no building, landscape element, hills or vegetation, which might have offered scope for developing further contextual indications of night. The inclusion of two flaming torches makes the point of night-time, but it is very doubtful whether these can be seen to have any implied lighting effect within the picture. There is generally a sense of the light falling from the right, and the west window, consistent with the general plan of the cycle. The torches are placed at about a quarter and a third in from the right. Thus two thirds of the figures, the centre and left of the tableau, including Christ, Judas, Peter and the arresting soldiers, are happily lit in a direction which corresponds to the torches' position as well as corresponding to the general orientation assumed for all the frescoes. But this looks to be no more than a fortunate coincidence, for figures on the right mainly show effects of light from the right. Perhaps some deeper contrasts, relative to other scenes, might just be read into the modelling, but in truth no special lighting effects can be determined. Night is merely signified by the presence of two torches, for even the blue sky is held in common with adjacent daytime scenes.

Pietro Lorenzetti offered some considered experimentation in his c.1317-20 version [Pl.310]. The blue sky gets some embellishment, a crescent moon, a speckling

of stars and shooting stars, to make it a more effective night sky. The sharp bright gold spots, besides speaking directly of a night sky, in contrasting with the deep blue, push this back in apparent tone, while preserving its lively azure hue. Below this sky effect the hills are light toned. Indeed, the background ones are, contrary to normal landscape practice,² noticeably lighter and less heavily modelled than those in the foreground or in other frescoes. Their trees, too, are rendered in very light tones. Against the dark sky these hills might be accepted as moonlit, even if, in indicating the passage of time from the preceding *Last Supper* scene [Pl.308]; the moon has all but set behind the hills. The partly successful impression of a bright clear night might be provided by the background and the sky but no contribution to nocturnal feeling is made by facial modelling or robes. The tones here are light, with little contrast, and quite similar to those for daylight incidents pictured elsewhere in the Passion cycle. The faces, figures and robes show no indications of any response to lamp or torch which, just as in the Duccio, Ugolino and Giotto versions, then provide iconographic values without taking on any practical role as effective sources of light. These are just tokens of night, theatrical props rather than active elements.

A fresco by Taddeo Gaddi, c.1330,³ exhibits innovative working in a nocturnal scene. In this case no token torches are involved but an imagined divine light source is shown and its effects described. The frescoes on the window wall in the Baroncelli Chapel of S.Croce are built round an imagined Divine Light. In this P.Hills argues very convincingly for the deliberate selection of episodes and their planning into a light centred programme in a group of six frescoes, three on each side of a stained glass window [Pl.258].⁴ The dominant colour of light passing in through the stained glass, also by Taddeo, is yellow and sets a chromatic note which is followed through in the surrounding paintings. The imposing golden hue makes heaven's blessing or illumination manifest, providing "an outward sign of spiritual communion"⁵ and unifies the complex pictorially and symbolically. It also, in the process, draws attention to the other essential element in the strategy, the careful, and evidently observation based, directional nature of the work. It is worth noting at this point that,

while these narrative frescoes all follow a disciplined incidence of light from the central window, outwards left and right, the contemporary altar-piece immediately below, a Giotto workshop tempera panel, has a quite different lighting logic. This, a *Coronation of the Virgin* [Pl.250], demonstrates the convention, adopted in most Coronations and described in an earlier chapter (see Chapter 3, pp.193-194) of a symmetrically inward incidence of light. Christ, and his attendants on the right, are modelled as lit from the right, while Mary and all on her side are lit from the left. In contrast, above this, the outwardly radiant directionality set by the window is evident in all the frescoes, if most obviously in the *Annunciation to the Shepherds* [Pl.259].

The *Annunciation to the Shepherds* has a much darker sky than in the works previously discussed, the blue having been rendered more opaque by dark under painting.⁶ Against this background an imaginary divine light, with its aureate hue, radiates from an angel or the golden cloud behind him, at the top and window side of the picture. The radiant nature of light, expanding spherically, is emphasised by the elegant curvilinear contribution of the sharply lit tree trunks to the composition. Importantly the main light source is patently not on the viewer's side of the pictorial surface which divides fiction and reality. It is well *inside* the picture space. This is confirmed by the apparent incidence of distinctly reported highlights and light and shade on the shepherds, their animals and the hill top. The fictional illumination falls on their far sides not on their visible sides. The nearer sides are largely unlit and upper surfaces, the top of the brow, chin and nose of the wakening shepherd for example, are defined by catching the glancing light from what today, in photography, is called *backlighting*. In the modelling attached shadows and areas of self shadowing all find their appropriate places with respect to these incident rays on those facets of objects and figures presented to the spectator. These effects are given pronounced emphasis through heavy contrast. The range of tones is wide, but the range and saturation of colours employed is strictly limited. The golden notes of the central light are balanced by some complementary violet tinted greys. Even though this did not quite produce a *grisaille*, such curtailment of colour effectively makes the picture an exercise in light

and shade. The natural lighting phenomena which might have prompted the resulting broad blocks of tone and the near monochromatic treatment are suggested as an eclipse or, perhaps a lightning flash.⁷ While either might explain the general effect Taddeo wished to capture, and in considerable measure achieved, it is much more likely he was following his own perceptions of normal nocturnal appearances, the reduced colour in low light level scotopic vision (see Chapter 1 pp.56-57), and the lack of the contrast-reducing ubiquitous light provided by the daytime sky. In any case, neither eclipse nor lightning suggest the novel pattern of light and shade he attempted. In this he took a most adventurous step, and the directional aspects which he chose to follow firmly placed the light source itself beyond the shepherds and deeper within the picture space. The result, for the viewer, means he looks with the shepherds towards the heavenly illumination. The viewer is involved and offered a share in their wonderment.

One area is protected from any extravagances of dramatic lighting contrasts. The depth of the attached shadows and shading is quite pronounced for every object and item painted, except for the face and hands of the awe-struck shepherd. Modelling on his up-turned features is largely dependent on specular reflection, but any expected deep shading is seen to be diluted. A self imposed discipline, perhaps unconscious reservation or habit, locally limits any bold attempt at chiaroscuro here, and the range of shading is restrained. Severe contrast is not allowed to interfere with, or obscure, the recognisable human features and the important expression implied. In that the shepherd's face could not be allowed excessive contrast, there is a suggested touch of frontal illumination. This does not take the level of the face or hand above that of the bright mountain side behind them and there is consequently some sense of a precocious *contre-jour* rendering, though perhaps this is merely the gratuitous outcome of the accommodation of convention in an innovative scheme. It is, however, difficult not to see that in recreating these effects some experimentation occurred in Taddeo's workshop, or serious observations made elsewhere, in checking on the local interaction of pose and lighting position. Some judicious placement of a lamp or a

deliberate *contre-jour* positioning of a suitable subject against a window must have been called for to allow for the truthfulness of the reported modelling for this non-standard arrangement. The close following of the shading and lighting geometry insists on such procedure.

But the careful treatment of the one astonished shepherd is isolated. A clear priority in the treatment of the human face is apparent. The anonymously draped second shepherd is subject to heavier shading and the foreground animals carry still darker, very dense, tones. The latter then rely for the differentiation of their forms mainly on pronounced highlights. Pliny's report concerning the innovations of Pausias, a near contemporary of Apelles, comes to mind.⁸ Pausias painted a foreshortened black ox, and *in confracto*, using broken light or highlights, gave form to the dark shape.

For all the evidence of close attention to actual effects in a painting seeking strong dramatic effect through light, and clearly based on observation, there is a very obvious lack of cast shadows which should fall dramatically towards us. These are avoided, though the celebrated shadow from the water bottle strap [Pl.260] stands as clear proof of some conscious notice taken of such phenomena.

The model set by Taddeo for the *Shepherds' Annunciation* is followed, in part, by a number of painters. For instance, Jacopo di Cione copies it forty years later in two upper panels of the 1370-71 San Pier Maggiore altarpiece, and it is interesting to see what a later artist makes of Taddeo's brave excursion. Jacopo's painting is all the more interesting in that the *Shepherds' Annunciation* is incorporated into a *Nativity* [Pl.357] and placed directly alongside *The Adoration of the Magi* [Pl.358]. The two panels have identical geography and architecture. Foreground figures in each vary to illustrate the stories but are represented, on both panels, in standard daylight tonality and contrast, as is their immediate, identically rendered, context of stable and rustic canopy. Differences appear only in handling of the background scenes. Comparison of these backgrounds shows *The Adoration of the Magi* to offer an essentially daytime landscape, somewhat different from the usual practice of an implied night visit of the

Kings. The guiding star is quite lost as a result. Jacopo's intention must have been to offer, in this, a contrast with the *Nativity* panel which was to carry the essentially nocturnal *Shepherds' Annunciation*. Light tones and contrast for the slopes, both verdant and rocky, and for the trees and distant castle provide a daytime ambience, though still with an aggregate of tones making these slightly darker than foreground rocks and buildings. Interestingly the direction here is left to right, contradicting the orientation in the lower part of the picture. Clearly a continuous reality is not aimed at here, and separation of the two different parts of the narrative may have been looked for. In the *Nativity* panel a positive attempt is made to suggest a night landscape as a context in which to set the localised divine illumination of the shepherds. Jacopo's thoughts on the depiction of night, perhaps indicative of some current notions, produced more broadly applied darker notes and increased contrast, but no change in direction. For the annunciation element itself Taddeo's example [Pl.259] is, at first sight, clearly echoed here. The same golden glow irradiates the shepherds. Their forms and postures, together with those of their animals, their immediate surroundings and the angelic messenger broadly repeat, in a mirrored reversal, the work of Taddeo. The same sharply defined forms are there and, as to be expected, there is no sign of cast shadows on the broad cleanly illuminated mountainside. One obvious difference, the golden sky, dictated by panel working, has to be accepted. While it extends the golden effect it loses the drama and focusing power of the deep toned sky. But other more informative differences emerge if we look further. The shepherds do not look back into the picture. Their gaze is outwards and upwards towards the illuminating angel. Although their garments show some oblique lighting, their facial modelling, with little shading reported, tell of a more frontally placed light, as does the similar high ratio of light to shade on the animals. But the illumination is still suggested as radiating from the angel. The inscribed rays on the golden sky background underline Jacopo's assertion of this. Here the angel and his light are, indeterminately, either a little nearer the spectator than the two shepherds, or perhaps on the same plane as them. The spatial geometry and the lighting arrangement implied are thus quite

different from the Baroncelli fresco. Jacopo's panel, in copying just the formal arrangements has his viewer merely observe a relatively flat tableau arrayed across the surface. The dramatic positive depth, and the opportunity to invite any direct involvement by the spectator, inherent in Taddeo's powerful earlier experiment is lost. Innovative pose, posture and light and shade are all avoided, or rejected, despite the superficial resemblance of the later version to the Baroncelli one. There is, in this process of following an exemplar in form, but not in the spirit of illusionistic effect, an indication of the reactionary trend felt to pervade the mid to late 14th century where a return to an interest in surface, pattern and decorative effect made interest in naturalistic depiction less important. Taddeo's experiments, were not taken up and did not lead to further 14th century technical advancement, and there was no assimilation of this particular novel usage into standard practices. Nor did Pietro Lorenzetti's moonlit background to the *Arrest* prompt copies in night scenes. Indeed in the 1370s we can find Giusto de'Menabuoi [Pl.383] closely repeating the Arena Chapel *Arrest of Christ*. Here fresco blue provides the sky and the only indication of night is again two non-functional torches.

Another subject which was regularly depicted with a source of divine light, or metaphorical illumination, included within the picture, and where we might look for similar effects anticipating or following such practice, was the *Stigmatisation of St.Francis*. There were early versions of this, two important ones being by Bonaventura Berlinghieri 1235 in Pescia, and the Master of S.Francesco, c.1255-65, in the Lower Church at Assisi. But these had just notional indications of lighting and no aspirations to any directional sense.⁹ The work subsequently followed as a prototype for most Trecento versions is that in the nave of S.Francesco Assisi Upper Church [Pls.207-208] from the end of the Duecento or the first years of the Trecento. Like surrounding paintings on the south wall of the nave it shows light falling from left to right, following illumination from the east window. The sense of lighting direction in this fresco is consistently followed throughout for the mountainside, chapels and figures. St.Francis, though turned away from this accepted natural light, on his right,

to face the seraphic apparition of a Crucified Christ on his left, is modelled, face, clothes, hands and upturned right foot, to suit it. There is one interesting and contradicting indication of light from St. Francis' left, that is from the divine vision. A bright highlight appears not on the side of the nose, but down the bridge, as possibly a token of a second divine lighting source. It is noticeably different from observations in adjacent frescoes. The faces in *St Francis Preaching before Honourous III* [Pl.205], painted during the same phase of work,¹⁰ illustrate the lighting distributions normally effected. Later versions of the *Stigmatisation* follow the form of the established composition closely, with St Francis generally on the left and the Crucified Christ on the right (this was true also for the earlier works mentioned). However, in later examples, such as the Louvre panel [Pl.237], c.1300, or the dynamic contrappostal fresco outside the Bardi Chapel of S.Croce [Pl.248], c.1325, where no particularly directional natural illumination dictated orientation, lighting can be from the right and so is compatible with that from the vision of Christ. Here no special hints of direction are needed, or appear, and no enhanced depth is created through any separate integration of a light source into the scene. One experiment, by Pietro Lorenzetti in his interpretation in the Assisi Lower Church [Pl.313], of around 1317-19,¹¹ attempted a multiple light scheme. For much of this fresco the depicted incidence of light, consistent with the pattern established for all the other frescoes in Pietro's scheme [Pls.302 & 303], is from left to right. This is apparent on the small buildings, and for Brother Leo and the terrain around him. St. Francis, though, is lit in the opposite sense, from the right and the vision of Christ. Additionally, having chosen to show a second countering light, be it artificial or supernatural, Pietro then provided an additional means of differentiating this through colour. St. Francis' features and habit display a warmer golden glow as a distinct alternative to the more neutral treatment of the seated Brother Leo on the right or, in general, of the surrounding hilly landscape and buildings. A sense of unique radiance from the seraphic vision high on the right is also given obvious substance on the rocky slopes. Some local delicate pink tints those facets of the mountain's rocks which are turned away from the natural light towards the

alternative source. A point of note is that the warm shading and modelling for St Francis himself is contained within the outline of his figure so that, in a sense, no local conflict of direction arose. He was an item illuminated from the right in a context lit from the left. For the mountainside, however, the change of colour was much more important. The mixture of colour here allowed for the indication of direction on the rocky terrain without any confusing shading lending ambiguity to the shape of the outcrops. Indeed, the two separate colour treatments added substantially to the three-dimensional appearance of these, the neutral coloured facets of rock turning distinctly into a another plane of alternative pink to lend solidity and local recession to the crags. Nevertheless, the effects tend to be local and, like the Bardi and Louvre versions, can't quite anticipate the concentration on light and shade which gave the Baroncelli *Annunciation* its dramatic depth.

A later *Stigmatisation of St.Francis* by Taddeo or his workshop, c.1350,¹² appears in the Refectory at S. Croce [Pl.266]. This fresco is treated as independent of local natural lighting, the effect of a large window to its left being discounted completely. There is no conflict with light from the Crucified Christ, located high on the right as convention decreed. Its execution could be expected to freely harness the earlier expertise used in the *Annunciation to the Shepherds* — and this example was but a few yards away — to give the mystical event some sense of actuality, particularly through significant pictorial depth. It did not quite succeed. St.Francis in the foreground is convincingly modelled with adequate contrast making his illumination from the seraphic Christ credible. Then other dark tonal aspects of the foreground and the self shadowing of the rugged slopes, to each side, all help suggest the light is well within the picture space. But for the main background the sense of radiant light was apparently sought more through overall pattern than any attempt to follow the effects of incident light from the notional position of the divine light source. The complication of this background, with its fussy compilation of buildings, trees and rocky slopes is unlike the clean simplicity of the Baroncelli *Annunciation*. In resolving its jumble of elements into a balanced composition the pivotal point of light and shade distribution

settles in the centre. The result is disruptive ambiguity. Two pictures result. In front is St. Francis and the seraphic Christ. Behind them is an unrelated background in which light radiates out from an unknown point in the centre of the picture. The underlying logic of the Baroncelli exercise is contradicted by elaboration and a feeling for pattern.

A further half century elapses before we can find a more successful version, in illusionistic terms, of the *Stigmatisation of St. Francis*. Gentile da Fabriano, in the first decades of the 15th century took matters forward in his version [Pl.398] Some reticence is shown in the treatment of St. Francis. He is posed and modelled quite frontally, with contrast restricted to leave his face and expression and, of course, the all important wounds of the stigmata clearly visible. That apart, the rest of the picture seriously attempts to register the effects of a single bright light radiating outwards into the observer's gaze. The densest of heavy shading, relieved by sharp golden highlights, tells economically of the shrubs behind St. Francis, and of the glancing angle of the spreading light as well as giving him an immediate nocturnal context. Less abrupt modelling, but still with deep variants in golden tones, modulates the distant hills to establish the radiation of light from a source well within the picture space. The shadow distribution on the balancing chapel confirms this. Brother Leo on the right, not afforded the reverence shown the Saint, is precociously depicted *contre-jour*. Strongly modelled, his highlights and shadows tell of light from above and beyond him, and it is his heavy cast shadow which makes the most impact. This spectacularly innovative effect, not just a tentative experiment, makes a positive statement. Just like the gnomon on a sundial it translates light into a linear declaration of direction, and so unambiguously locates the light source.

Interior Night and Artificial Light

Trecento attempts to suggest night and the effects of artificial light in exterior scenes were clearly problematic. Apart from the essay of Taddeo Gaddi noted above the inclusion of a light source within a picture of an exterior was generally a matter of token elements, lamps or torches, being used uncomplicatedly as simple hieroglyphs

or graphic labels denoting night. Such lights had little obvious influence on the light patterns within the picture. The more contained circumstances of interiors might be seen to offer the chance to provide more controlled and closely observed examples of light's inter-action with solid objects and people. However, in general, lamps and lights do not feature as active elements in interiors either. Examination of interior architecture and furnishing depiction show the rules of procedures adopted for light and shade were the same night or day. For example, where episodes take place at night, but indoors in the *Maestà*, Duccio keeps steadfastly to the standard pattern for these and makes no differentiation of lighting between day and night. But elsewhere one or two serious attempts to make more of a light source within a room are to be found and, though such adventures were not followed up, these excursions are very informative.

Pietro Lorenzetti painted a *Last Supper* [P1.308], c.1317-19, in the Lower Church at Assisi, which intriguingly presents the event in artificial lighting. There is a main and auxiliary scene, each with their own lighting schemes, and, as further contrast, both are set together within a moonlit exterior. The main interior depicts a hexagonal and pavilion-like, chamber with a background lit impressively by an internal, apparently central, low light source, though there is no real sign of a lamp. Meanwhile, in the adjacent kitchen a similarly low light source gives illumination, but this time it is shown as a fire blazing in the hearth. The fire here has been suggested as the illumination for the whole fresco.¹³ However, the precise geometry of the confident shading in the architecture of the main chamber, seen along with the accuracy of shading in the kitchen, can be seen to rule this out. The very explicit symmetry of the shading of the ceiling, and also on the corbelled soffit requires the light source to be in the main room, and these very positive lighting effects can hardly be ignored. The most spectacular item in the main room, the ceiling gets its shape from the conspicuous modelling of the radial woodwork and rafters generated by the elusive low interior light source. Judging by the pattern of light on the ceiling the likeliest position for such a light would be on the table at the dish in the centre of the

table although the darkness of the table argues against this, and the dish, now with no recognisable shape or form would more likely have been one carrying the Passover lamb, as in Duccio's *Maestà* version [Pl.290]. Nevertheless, there is every indication in the modelling of the disciples' faces that such a central light is involved. The two nearest, for example, turned in to each other, profile and semi-lost profile, both take their highlights from the centre. This is quite contrary to Pietro's normal adherence to a common single direction of light and certainly different from the consistent left to right sense applying in all the other frescoes in this Assisi Cycle [Pls.302-303]. There is also in the Disciples' garments further, but more general, confirmation of this patterned centrality of light with the deeper shading falling away from the table on each side of the group. Consistent with this, it is also possible that there was an intention that the light was radiating out and forward from Jesus. However, the more down-to-earth naturalistic tendencies displayed elsewhere in Pietro's work would suggest this is unlikely. For example, Christ appears in very distinctly spiritual guise, in the *Resurrection* or *Descent into Hell*, both also in Assisi Lower Church, when he might readily have been a source of divine illumination. In these he has no radiant effect on associated figures or surroundings.

The main outer room shows other experimental departures from convention. Its far wall is shown as the brightest one, contrary to the standard depth convention. Indeed, all the flesh tones are noticeably, and unusually for an interior, depicted as darker than the back wall. But the wall is also brighter than the table. Here is an unusual situation where a table top is not given any substantial brightness, though the tops of the benches on which the disciples sit do very brightly conform to the "light from above" idea. The dull table is rather perverse, one would have thought. Considering the place this particular table, the prototypical eucharistic altar, assumes in the liturgy of the Church it could be expected to have had some brighter emphasis. Other departures from normal practice are explicable as conforming to the general lighting logic which Pietro was evidently pursuing to confirm light within the room. He is intent on the accentuation, with lighter tones, of the undersides or surfaces of

the room's upper architecture. Other indications of the upward and outward spread of light appear very convincingly on the under sides of the room's trefoil outer arches. These are seen contrasting with the darker outside surfaces of the building. Interestingly, these surfaces are not left as any single set of tones but are part of an alternative exterior lighting programme, a colder moonlit one. The moon itself is shown, though more as a token of time, in the background sky. This second lighting plan gives a left to right modelling of the exterior consistent with the rest of the transept's Passion Cycle. It is itself expressed elegantly in the modelling of the classically inspired sculptural decoration, though its real importance is as a foil complementing the interior programme. The lighter upper surfaces of the apostles benches then have further purpose in this, for their sides are shaded as part of the exterior pattern and their upper planes are part of the interior. Above this the interplay of nocturnal exterior and interior is more stimulatingly varied. The discreetly ranged tones of the outer faces of the three arches not only give shape to the hexagonal structure but let each of these add its own varied contrast to the interior light. In this it is not just the tonal values of the exterior which are carefully controlled. A limited chromatic range is also part of the plan. The desaturated, close to monochromatic, moonlit exterior and the full colour of the artificially lit interior complement each other to reinforce the feeling of night both inside and outside the building. The reduced colour content on the exterior is perhaps a shrewd appreciation, and precocious simulation, of the effects of night, or scotopic, vision. Here the eye adapts to lower lighting conditions and no longer offers its daylight photopic response. The ability to be discretely sensitive to the full range of colours is lost, though the visual system remains still responsive to light and shade variations (see Chapter 1 pp.56-57).

The soffit running round the interior is also used as a pointer to a low interior light. But, with its over enthusiastic contrasts, it paradoxically provides an interesting example of the expectation that light ought to come from above. Pietro in showing this feature as a very brightly under-lit surface, with the darker tones of the corbels thrown into relief below it, and with a colour contrast, red and white compounding the effect,

made it difficult to see this arrangement as other than a top view of white steps with complicated indented risers. This rather contradicts his intention.

Still, if the main room's tonal adventures are, in some details, a little confusing though interesting, the side scene [Pl.309] is an almost unqualified triumph. Perhaps the red fire, iconographically correct in Trecento terms, is the only item which doesn't convince a modern eye, but otherwise the observation of all else is very satisfying.¹⁴ The ceiling beams and framing arch are well and appropriately modelled. The recessed shelves are effectively depicted and even have the gentle touch of a rosy glow on their undersides adding coloured interest to the radiating light of the fire. Both the servants, with their genre detail of clothing, dish-cloth, patterned towel and plates, are shown as convincingly lit by the fire. In the foreground an obliquely lit dog and back-lit cat help confirm the radiant light of the fire. They do so not just by the directional clues in their modelling, but also by uniquely having cast shadows which radiate outwards to help complete the directional pattern of the fire-light and confirm the three-dimensional interrelationship of fire and objects within the fictive space. Intriguingly the animals have cast shadows and the humans don't, but no satisfactory reason for the differentiation has thus far been suggested.

This virtuoso performance appears to have been unique, and, though the particular experiments here might seem to have been successful, the various effects were not copied in others' work. The overt under-lighting of buildings from artificial light is not followed, neither is the idea of cast shadow. We have to wait until Gentile da Fabriano and the second decade of the Quattrocento before similar innovative work reappears in the *Nativity of the Strozzi Adoration of the Magi* predella [Pl.400]. Pietro's and his contemporaries response we might conjecture. The ceilings were clearly effective and must have satisfied, but then the soffit, too, was given a similar but exaggerated tonal and colour separation treatment. Would the excesses of tonal and colour contrast be recognised as camouflaging the architecture rather than help display it? Then for all its effectiveness such complexity and open exhibition of technical expertise perhaps got in the way of the true use of the picture, the provision

of a religious message. The self conscious technical display, becoming too self aware, takes over the picture. The need was for the teaching of religion not the teaching of illusion.

Pietro Lorenzetti was the not first to attempt the difficult task of incorporating a meaningful source of light within his pictures and meeting the attendant problems of reconciling its effect with traditional practice and habitual expectations. About ten years earlier Giotto had attempted a most extraordinary technical essay in controlled interior lighting. In Padua's Arena Chapel the fresco showing *Jesus Before Caiaphas* [Pl.230] has, as its main light source, a single torch. The flames of the torch weren't red, like those torches and lanterns in Duccio's version, or the fire in Pietro Lorenzetti's *Last Supper* and not red and yellow as Giotto himself painted in *The Arrest*, in fact the torch wasn't painted. This single torch, now blackened over time, is just the remnant of what was presumably originally brilliant metal, possibly silver, but more likely false gold, *oro di metà*, now oxidised just like the cheaper haloes of the apostles in some of the other frescoes or the helmets of the attendant soldiers.¹⁵ It provided the centre around which a pattern of lighting effects within the room was created. Some conventionally obligatory lighter modelling of foreground characters tends to mask the effects and now, for us, the loss of the torch's brilliance compounds this.

The actual effect of a single light in the middle of the imagined space would, if rigorously followed through from observation, have left the foreground faces, particularly Christ's, as dark and unlit. Jesus, and the soldiers immediately behind his left shoulder, are between us and the torch and so cannot have any direct light from it on their faces. Deep shading, chiaroscuro, let alone silhouette, were out of the question. Consequently, to maintain the required clarity and ready recognition, some conventional modelling appears on these faces. This implies some additional frontal illumination. For Jesus this is soft, but displays a directional component from the right, broadly conforming to the consistent overall plan of the chapel scheme, which accepts light from the west window as its reference. But, with Christ's left cheek and brow

brighter, this arrangement doesn't completely deny the torch's position for this is to His left. The figure just on His immediate left has a similar accommodation but with near frontal lighting, while the soldier in green has his lighting biased towards the left. Beyond these compromises between reports of actuality and conventional requirements if we look at the wider treatment of other figures and the room itself, we find the rest of the light and shade arrangements then fall into place in an adventurous scheme which displays not just a very clear understanding of incident light and the subtleties of shading, but also a coherent strategy to creatively control and illustrate a radiant light's effects in the scene. The directional effects of the central torch are broadly followed for most of the other participants and picture elements, helping to point up the dramatic essentials of the story. Around Christ, and the central guards, the other figures, to the left and right, all show signs of modelling and positive highlight responses which tell of light in the centre of the pictured room. This is particularly true on the right side where, if the general illumination pattern of the chapel were followed, Caiaphas, would have been lit from the right. He, together with his neighbour and their robes, are modelled, and both given highlights, to confirm their dependence on the, now sadly dulled, torch flame. But the real successful part of the adventure is in the portrayal of background. "Portrayal" because it is just that, being much more than a prosaic assembly, or trotting out, of the required clues and standard iconographic hints of an interior. This is an accurately observed picture of actuality in a room, but with all the significant undertones of dramatic meaning reported and consciously communicated together in an incisive but original iconographic statement. The room becomes, as a powerful context, an active participant in the event making up for those limitations, dictated by conventions and reverence, which in different ways inhibited dramatic expression in the human participants. The flame, gold but now oxidised, just behind Christ's golden nimbus, is clearly to be equated with Him. The physical radiance so accurately, almost clinically, depicted must represent Divine Light, and the violent rejection of this Holy enlightenment by Caiaphas can only be a visual statement of John chapter 1, verse 5, "And the light shineth in the darkness; and the

darkness comprehended it not".¹⁶ A remarkable iconographic invention, but one matched by, and indeed only really effective thanks to, an unexpected technical virtuosity, which would seem to have no real precedent.

The torch light, besides being at the spiritual centre of the work, is also at the compositional and perspectival centre of the work. It is in line with the viewer's position, as the convergence of the rafters confirm. It illuminates the ingeniously designed ceiling which reflects and extends the radiant brightness, but still turns and redirects visual attention through the interestingly shaped brackets. This is accomplished through a very careful depiction of a combination of shading and shine. The polished nature and shape of beams and brackets catch and reflect the light. The carefully chosen shapes of these brackets not only add sparkle, with local highlights catching on their many facets to enliven the scene, but also underline the positive spread of illumination while still containing the dramatic action. A conscious and sure control is evident here but at the same time the instruments of control are just as surely derived from careful observation. For example, the subtlety of the distribution of reflections both along and across the lower surfaces of the beams, telling of the outward radiation of the torch light might only be explained by either some clever mathematics and a good grasp of how light is propagated or, alternatively, by keen observation. The first is not in any way plausible and acute attention to nature must be concluded. This play of convincingly reported light continues on through the whole scene. The symmetry of the pattern derived from the near central torch gives the middle of the back wall a glow which tapers off into each of the far corners. The two shuttered windows there add to this sense of symmetrical radiation, being offered as near mirror images with very precise depiction of the light and shade observed in the detailing of their recesses. There is also the suggestion of forward spreading cast shadows on Caiaphas' throne plinth. The shadows, particularly the one on the lower step, might be seen as a resulting from the general light from the west window. But such shadows, quite unique in any case for this period, don't have any counterparts elsewhere in the Arena cycle. Besides, those on the upper step do not fit in easily as

shadows of Caiaphas falling to his right and into the picture. The shadows are more acceptable and appropriate as part of the experimental essay's strategy. They can be seen as cast by the guards or torch bearer. Their purpose is unlikely to be the precocious and conscious linking of these figures spatially with the High Priest's throne, though such an effect is produced, but more simply part of the outwardly radiant composition. In the headboard of Caiaphas' throne there are other signs of this strategy. The carvings here provide a wealth of detail to catch the light and confirm its spread. But even at the very limits of the imagined chamber, the framing elements are touched by enlightenment, both real and metaphorical. Here the inner faces of verticals with their upper profiles carved to match the ceiling brackets and the under surface of the lintel, all glow. The result of this last touch not only shows the light as now reaching out to fill all the fictive space created by Giotto but also implies that it is continuing on outwards, to be effective in the real space which we as viewers occupy. Surely the engagement of the spectator with a picture cannot have been so positively sought before this work of the first decade of the 14th century.

Later Depiction of Light within Pictures

The few dramatic exercises from the first three decades of the Trecento, which looked at the physical nature of light itself and attempted to handle its inclusion within the fictive space of the picture were not pursued any further. Nor were they picked up by later workers, other than as superficial copies. Such copies merely aped the formal patterns but followed older workshop procedures of dealing with shading. As we saw the *Shepherds' Annunciation* in the San Pier Altarpiece by Jacopo di Cione formally repeated the tableau presented by Taddeo Gaddi but resorted to conventional light and shade treatment. With little appreciation of the insights offered into the behaviour and nature of light in these circumstances the techniques used to simulate its effects were not assimilated into standard work shop practices.

The challenge to handle light within the picture in a convincing way was not taken up by the painters of the later Trecento. It was not until the early 1400's that any

indications of renewed interest in the physical nature of light began to emerge again. Traditionally Masaccio is singled out as offering the first signs of a positive interest in cast shadows, with the *Pisa Polyptych* or the *Brancacci Chapel Frescoes*. But the combination of shadows and a serious attempt to accommodate a light source into a picture, signalling a renewed interest in the physical nature of light, is perhaps more spectacularly seen in a work by his older contemporary Gentile da Fabriano. Gentile's *Stigmatisation of St. Francis* [Pl.398], already discussed above (p.382), and *Adoration of the Magi* altarpiece, of 1323, [Pl.399], both show his inventiveness. The latter has a most spectacular, richly decorated, main panel whose poetic priorities lean more towards matters of sumptuous texture than illusion. This richness tends to seduce the eye and take attention away from the very innovative work in the predella panels below. It is in these that the various strategies, tried about a century before by Giotto, Taddeo Gaddi and Pietro Lorezetti all reappear in confident form. The *Presentation in the Temple* [Pl.402] has an internal light, a lamp above the altar, which provides a shading pattern on the rear wall of the temple quite as convincing as that realised by Giotto in *Christ Before Caiaphas* [Pl.230]. It also is shown to illuminate the undersides of the vault ribs just as the Lorenzetti *Last Supper* [Pl.308] suggested. The *Flight into Egypt* [Pl.401] offers a morning scene with the newly risen sun included in the picture.¹⁷ *Contre-jour* effects are essayed on the left hand side with back-lit trees and even shadows of these thrown forward towards the foreground as the light is shown to radiate outwards. The furrows of the fields, while persuasively realistic, are ingeniously pressed into service as rays to help this radiant impression. Further right, the oblique light determines the atmosphere in the background. The restrained, very localised, use of lighter tones gives weight to the hills and shape to the trees while still leaving them as dark remnants of night still to be dispelled. On the extreme right, the

distant city, its buildings presented in oblique perspective, warmly reflects the dawn. The viewer's scan across the panoramic setting moves from the *contre-jour* left to a more frontally determined right. The general mood of the narrative is set by the background effects. The important foreground figures of Mary, the Christ Child and Joseph are protected from the ravages of oblique lighting and are modelled more decorously as convention dictates. Indeed, Mary is modelled as lit from slightly right of frontal, and this is all the more apparent in comparing her with the less important maid-servant on the left, who has most of her features in deep shadow. Experiment and convention are seen hand in hand here. However, the left hand predella panel, the *Nativity* [Pl.400], is still more innovative in matters of light.

Here at least three light sources are included within the picture itself, and serious attempts are made to fully register their effects. Moonlight, and divine light, both from the Christ Child and from the shepherds' angel are all active illuminants. The central source is a radiation from the Infant Jesus lying in front of Mary. The outward and upward spread of this light is carefully reported. Mary is accurately modelled to follow this. Her hands in particular are convincingly shown as underlit. The animals and their manger follow suit, while beyond them the lightened inner edges of the cave are markedly different from the traditional highlighting of projecting edges (see Chapter 1 pp.78-80). Still further out the light is shown, by very economic use of highlights, as giving shape to the branches of the barren tree beside the sleeping Joseph. Joseph himself, in turning away in sleep from the Infant and His light, is modelled more frontally and displays reduced contrast. The implication is of yet a further light source! To the other side, behind Mary, further innovations are obvious. The modelling of Mary's gown is remarkable. In following the light from well round to right it is quite different from Cennini orthodoxy. It clearly indicates an overall

strategy of the light's effects reducing around the whole figure and garment rather than the recording of local rise and fall of the individual folds. The end result is a deep self shadow which flows into a true cast shadow on the ground behind. This shadow then extends to the stable building behind giving shape to itself and the door sill in a small but sharp transition. The upper edge of the shadow is lost in the door recess, but the brightness of the far side of the door tells emphatically of the light passing behind Mary. The pronounced underlighting of the canopy, with its contrasting roof, and the bright undersides of the doorway arches confirm the upward and outward spread of light, though no rising shadows from the angled supports are allowed to spoil the clean lines there. Further to the left the shadow effects, from the main building, extend still further and here a further adventurous leap is taken. A double cast shadow appears. The main light from the Infant is interrupted to give a sharp shadow on the underside of the lean-to shelter while moonlight projects the shadow of the roof onto the main building. The moon itself appears in the top left corner and gives a soft touch of local light to the adjacent hill there. Besides the moon there are a multitude of stars in the sky and there is associated with them a distinct glow which gives the silhouetted background mountains some rounded shape. Elsewhere, in the top right hand corner, Gentile's version of Taddeo Gaddi's *Annunciation to the Shepherds* [Pl.259] appears. The same composition, mirrored to suit the particular position in this work, is employed, as is the, by now standard, golden irradiation. But, following Gentile's own successful earlier experiments in *The Stigmatisation of St Francis* [Pl.398] (see above p.382), there are now some well defined, forward cast shadows.

It must be noted that the innovations in Gentile's painting appear alongside examples of conventional Trecento and Duecento practices which were still being observed. The special treatment of the faces, with privilege given to more revered

characters than the less important continues. The “light advances, dark recedes” maxim still finds overt, but arbitrary, expression in the local darkening of more distant wall surfaces in the *Presentation in the Temple* [Pl.402]. Where two buildings overlap, to indicate recession, the more distant one is pushed down in tone in the immediate area of the juxtaposition.

The work then is a transitional one with these older traits sharing space with symptoms of a new awareness. But as an exercise in the recognition and reporting of actual lighting phenomena these predella panels are remarkable. A renewed interest in the mechanics of naturalistic painting appears all the more surprising in the context of a major International Gothic work which revels in the decorative surface and pays only limited attention to illusion. Nonetheless, they show Gentile, taking up a whole range of innovative techniques, tentatively tried early in the Trecento but then ignored, to show them now to be available in the Quattrocento. The *Nativity* in particular demonstrates a nascent understanding of these techniques and the concepts behind them. The nature and effects of light within the fictive space, the appearance of more than one light in a picture, and a keen appreciation of the nature and use of cast shadows all appear in one small panel.

Chapter 8 Notes

- 1: Aeschylus, *The Oresteia*, trans. R. Fagles, London 1977, pp. 103-104, *Agamemnon* opens with a watchman waiting in the night for a signal beacon, while *The Eumenides*, pp. 275-277 ends with a torch-lit procession. Performances were in daylight. See, Sophocles: *The Three Theban Plays, Antigone, Oedipus the King, Oedipus at Colonus*, trans. R. Fagles, London, 1984, pp. 21 and 22. The prestigious tragedies took an early precedence on the days of dramatic festivals, comic offerings were given later. The first three performances, on each of three days, were competing tragedies, and the first play would start at sunrise. Similarly daytime performances of Comedies required the acceptance of night, indicated by the spoken word and also by lamps and torches. Aristophanes *Wasps* starts before dawn and has a procession with lamps (Aristophanes, *The Wasps, The Poets and the Women, The Frogs*, trans. D. Barrett, London, 1964, p. 47 "And be careful how you go, you still need your lamps . . . Get a twig and trim the wick a bit lad, I can't see a thing").
- 2: Cennini (Thompson), *op. cit.*, Ch. LXXXV, pp. 55-56, covers the normal practice of painting distant hills darker than near ones.
- 3: Ladis, *op. cit.*, pp. 89-90, rehearses all the varied discussions on dates between 1328 and 1338 for the Baroncelli frescoes with a date in the early 30s seeming most likely.
- 4 Hills, *op. cit.*, pp. 75-83.
- 5 *Ibid.*, p. 79.
- 6: Ladis, *op. cit.*, p. 31, "the unusual dark brown preparation, which makes the blue opaque and the yellow incandescent, must be seen as part of a careful plan to stress the theme of illumination throughout the chapel".
- 7: Hills, *op. cit.*, p. 81 suggests that experience of a lightning flash might have provided the example of high contrast and near monochromatic effects which Taddeo followed. Ladis, *op. cit.* pp. 89-90, reports that the 1332 total solar eclipse and the 1339 partial eclipse featured in debates concerning the dating of the Baroncelli frescoes. There is some surviving correspondence between the Augustinian preacher Fra Simone Fidati and a "Taddeus de Florentia" whom Maione identified as Taddeo the painter. (Maione, *L'Arte*, XVII, 194, p. 107.) Although there is no firm evidence for this positive identification it is accepted by a number of scholars; Ladis cites amongst others Smart, Gardner and Donati. There were references to solar eclipses in the exchange of letters and this offers support to the notion of Taddeo's positive interest in such phenomena prompting him to trying to recreate them in paint.
- 8: Pliny, *op. cit.*, Bk XXXV, 126-7, "(Pausias) . . . eam primus invenit picturam, quam postea imitati sunt multi, aequavit nemo. Ante omnia, cum longitudinem bovis ostendi vellet, adversum eum pinxit, non transversum, et abunde intellegitur amplitudo. Dein, cum omnes, quae volunt eminentia videri, candicanti faciant colore, quae condunt, nigro, hic totum bovem atri coloris fecit umbraeque corpus ex ipsa dedit, magna prorsus arte in aequo extantia ostendente et in confracto solida omnia."
- 9: The Pescia panel is dated 1235, while the date for the Assisi fresco, with a seraph as the apparition must be before St Bonaventura's *Legenda Maior*, accepted in 1265 as the only official version, required the vision to be a Crucified Christ.

- 10: Tintori & Meiss, *op. cit.*, Confirmed the order in which the *Life of St Francis* frescoes was carried out. The four frescoes in the wall bay at the east end of the south wall of the nave were executed as a group.
- 11: See Chapter 3, p.207, note109.
- 12: Ladis, *op.cit.*, p.172, discusses the attribution and dating of the S.Croce Refectory frescoes. Their attribution to Taddeo or his shop is generally accepted, but their dating enjoys no such agreement. He suggests "most writers have placed it near 1350", while citing a whole range of opinions from, for example, Borsook's early suggestion of 1330's (*The Mural Painters of Tuscany, from Cimabue to Andrea del Sarto*, Oxford, 1960), through Ferretti's and Longhi's election of the 1340's, Van Marle and White seeing it as post 1350 (White, *op.cit. (Birth and Rebirth)*, p.112), to a 1360-66 assessment by Donati (*Taddeo Gaddi*, Florence, 1966, p.29). At the same time he himself had assumed a date of "around 1360" in his general text, *ibid.*, pp.66 & 73. A later opinion by White *op.cit. (Art & Architecture)*, p.417 has him caption his illustrations of this work as c.1340-50.
- 13: Frugoni, *op.cit. (Lorenzetti)*, p.18.
- 14: The ancient and medieval relationship of the elements and their corresponding colours is fully discussed by Gage, *op.cit.*, pp.29-33. In p.29 he notes that, though the concept of four elements was first raised by Empedocles in the 4th century B.C., "It was not until the first or second centuries A.D., in Aëtius (*Epitome of Physical Opinions* I, 15.8), in Galen (*On the Elements from the Hippocratic Opinions* I, 2) and in pseudo-Aristotelian *On the World* (396b), that there seems to have been any positive agreement that there were four basic colours related to the four elements, and that these were black, white, red and yellow." Various correspondences were suggested, at different times, but one constant equation in the different schemes had red paired with fire. Such ideas were still prevalent through into the Quattrocento and references occur in Alberti's writing.. In the initial, 1435, Latin version of his treatise, Alberti (Grayson) *op. cit.*, pp.44-47, he admitted of different theories in natural philosophy concerning light and colour. For some there were seven kinds of colour in a range comprising black and white at either end of a gamut with a further five intermediate ones, while according to other philosophers, there were only two basic colours, black and white, and all others were different mixtures of these. But he continued, *ibid* pp.46-47. "My own view about colours, as a painter, is that from the mixture of colours there arises an almost infinite variety of others, but that for painters there are four true kinds of colours corresponding to the number of the elements, and from these many species are produced. There is fire-colour, which we call red, and the colour of air which is said to be blue or blue-grey, and the green of water, and the earth is ash-coloured." The Latin is, "Ego quidem ut pictor de coloribus ita sentio permixtionibus colorum alios oriri colores paene infinitos, sed esse apud pictores colorum vera genera pro numero elementorum quattuor, ex quibus plurimae species educantur. Namque est igneus, ut ita loquar, color quem rubeum vocant, tum est aeris qui celestis seu caesius dicitur, aquaeque color viridis; terra vero cinereum colorem habet." The 1436 vernacular version, for painters rather than Humanist intelligentsia, omitted the passage on the allusion to alternative philosophical theories and repeated his painter's version more concisely, "but there are only four true colours, just as for the elements. From these more and more other kinds of colours are created. Red is the colour of fire, blue of the air, green of the water, and of the earth grey and ash." The Italian being, Alberti (Mallè) *op. cit.*, p.63, "ma veri coloro solo essere, quanto li elementi, quattro dai quali più et più alter

spetie di colori nascono. Fia colore di fuoco il rosso, dell'aere cilestrino ,
dell'aqua il verde et la terra bigia et cenericcia.”

- 15: Tintori, *op.cit.* (Golden tin), pp.94-95. The Arena Chapel's lower tier haloes, except Christ's, are *oro di metà*, mixtures of different base metals with perhaps just a touch of gold, and these are now blackened. For the appearance of white metals, as in armour, *stagno bianco*, tin was used and this too is now black.
- 16: Quote is from the Authorised Version, the Vulgate in John 1:5 has “Et lux in tenebris lucet, et tenebrae eam non comprehenderunt”
- 17: The episode here may be *The Journey from Bethlehem to Jerusalem* rather than the *Flight to Egypt*, see D. Ekserdjian, ‘Gentile da Fabriano’s “Journey from Bethlehem to Jerusalem”’, *Burlington Magazine*, 124, (1982), p.24.

CHAPTER 9

SHADOWS

While in previous chapters cast shadows, or at times hints of cast shadows, have been part of the discussion as contributing factors, they demand some separate attention as phenomena on their own. Not least because, paradoxically, in their most obvious hard edged form, they hardly exist in Duecento and Trecento painting.

Nonetheless, even if the first serious signs of the employment of cast shadows are to be looked for in the early Quattrocento, with Masaccio's Pisa altarpiece [Pl.409] and the Brancacci Chapel frescoes [Pl.406], or as noted above in Gentile da Fabriano's work, there are various signs of intermittent interest in these effects through the previous century. A few interesting essays, which positively tried to describe hard cast shadows, appeared, and a form of soft shadowing became a standard feature in many paintings. To see explore these I wish to address the following aspects:

The utility of the depiction of cast shadows in the creation of illusion.

The historical use and subsequent neglect of these.

The omission of cast shadows in Duecento and Trecento painting.

The isolated appearance of harder edged cast shadows.

The use of soft overhead penumbral shadows.

False and spurious shadows.

13th and 14th century reticence in depiction of cast shadows.

The utility of the depiction of cast shadows in the creation of illusion.

The use of cast or projected shadow offers the artist, seeking the illusion of spatial depth, a most useful tool. While shading and attached shadows offer

indications of local relief to tell of size and volume within the limits of one particular form, cast or projected shadows can provide additional information on an object's position in a linearly defined fictive space where, otherwise, only diminution of scale or overlapping of forms might tell of the spatial relationship between them. Shadows cast on the ground plane give an indication of position or depth within such space [Pls.31 & 35], while those projected between items can indicate the spatial inter-relationship between them. [Pls.20, 38 & 39]. In offering a visual clue as to the direction of incident light they can support, and reinforce, the signs of light orientation indicated by the modelling within the various elements of a picture, and help integrate these into a coherent composite scene. In this they can also serve to integrate the light source itself into the picture, or add yet a further expanded sense of space with this source's implied existence *beyond* the picture frame : this is more noticeable with oblique lighting. The directional suggestions from shadows tell of both horizontal and vertical origins of incident light. The upward cast of a shadow tells of a low position of any light while its downward cast tells of light arriving from above.

The nature of the shadow's shape gives information about that of the light source itself. A soft shadow indicates a large source, like a cloudy sky. A hard edged shadow tells of a more concentrated one, like the sun or a lamp (see Chapter 1, p.52). Between the two a range of relative hardness or softness provides evidence of differing circumstances, and with it an opportunity for a painter to be selective in offering a sense of atmosphere or environment.

Although offering knowledge about the shape and position of the object which casts it, the shadow, through distortions in its form, can add information concerning the three dimensional nature of the surface on which it falls. *Perseus and Andromeda* [Pl.20] shows an ancient example of the skilful use of painted shadow in this

informative way. There the rock below Andromeda's foot has its contouring defined by the shadow's undulation.

Historical use and subsequent neglect of cast shadows.

The various effects noted above are perhaps apparent to 20th century viewers, but were not necessarily important to people and artists of the 13th and 14th centuries. They were, at least in part, understood in still earlier periods and clearly their depiction was accommodated in antique painters' skills. The appreciation of some of the benefits to illusionistic painting of describing cast shadows are apparent in the 1st century A.D. *Perseus and Andromeda* as noted above [Pl.20]. The employment of cast shadows was avoided, rejected or neglected in late medieval pictures but they were found throughout antique art at varying levels of sophistication. Dioscurides' *Street Musicians* [Pl.31], 1st century B.C., are firmly placed by their cast shadows at appropriate points on the ground plane and even quite run of the mill mural decorations in 1st century A.D. Pompeii had recourse to this device [Pl.35]. The more sophisticated *Aldobrandini Wedding* [Pls.38 & 39], of the same era, makes telling use of cast shadows. Here figures and details are well integrated by the clear indications of shadowing between individuals.

The good fortune which provided evidence from Pompeii, Herculaneum and neighbouring locations has left a wider understanding of 1st century A.D. picture-making than at other times in antiquity, but thereafter it is impossible to track the fortunes of shadows through into later periods with any certainty. A few examples in mosaic work do survive and the early 5th century Sta.Maria Maggiore nave mosaics [Pl.47] show distinct ground shadows. These, however, are presented in a conventionalised triangular form which already had become a stylised notation for such

shadows. The coded forms here are a schematised version of the effect produced by a small local source such as a candle (Chapter 1 pp.52 & 66). They still succeed in locating their figures on the ground plane. Somewhat later, in the middle of the 6th century, when a few more surviving works might allow of assessment, the indications are that cast shadows have disappeared or are disappearing. By then the cross shadowing between figures is no longer given expression. However, the fan shaped shadows continue to appear, not across the board but here and there, to locate figures rather inconclusively on a notional ground plane. Examples can be seen in Ravenna, S.Apollinare Nuovo [Pl.52], and Rome, SS.Cosma e Damiano [Pl.55], with the latter illustrating the arbitrary patterned nature of the late versions of the stylisation. The intermittent occurrence of these shadows points to further declining interest and other mosaics of approximately the same time. *Theodora and her Court* [Pl.58], from San Vitale in Ravenna for instance, have no shadows at all. Such omission heralds further change. Subsequently, with the balance moving to more transcendental art with anagogic, rather than narrative, purposes, the location of a holy figure on any earthly plane was hardly an overriding requirement.¹ Shadows, as superfluous elements, dropped out of standard picture-making procedures. Their re-institution after several centuries met with some reluctance, apathy or perhaps even opposition.

Omission of shadows in Duecento and Trecento Painting

The absence of shadows is obvious throughout 13th and 14th century painting, but is particularly apparent in the lack of those, sometimes small, contact shadows, where a hand touches a garment or, most obviously, where a foot touches the floor or ground. No matter how broad and soft the light source, or how all-surrounding is the ambient illumination, in practice the point where a foot or robe touches the ground is

always shaded in some measure. A shadow results giving an impression that the figure and ground are contiguous. Such effects only begin to be reported in the early Quattrocento. Gentile's *Stigmatisation of St Francis* [Pl.398], has subtly observed shadows where St.Francis' habit touches the ground to positively tell of contact. Then Masaccio's Pisa Polypych [Pl.409] has, besides the often noted woodwork shadows of the throne, the hem of Mary's gown brushing the plinth. These shadows, with subtle variations, tell naturally of the minutiae of contact, closeness and increments of separation. Such contact shadows are not normally seen in Duecento or Trecento works, though here and there some accidents or touches of local tonal separation do offer some false suggestions. A clear indication of omission is found in Giotto's Arena Chapel *Presentation of The Virgin* [Pl.220]. St Anne's robe rests on the steps as she follows Mary up to the temple. The garment does not restrict the light reaching the steps in any way and the line between fabric and stone is precise and clean. The foot of the burdened servant following her is an even more obvious example, since the distinct but soft modelling on the foot itself would suggest there ought to be an accompanying localised loss of light on the steps. The effect, for both figures, is that they are apparently "cut out" figures pasted on to the stairway.

It would appear from such examples that the truth of form, and hence its definition in drawing, is given priority in Duecento and Trecento painting. Linear precision is being pursued here in crisp outlines. A soft shadow, even if observed and then reported in the *Presentation of The Virgin* [Pl.220], would tend to disturb the drawn shape by obscuring the boundary between foreground figure and step. In comparison, if we look forward again, to Masaccio's work, the feet in *The Tribute Money* [Pl.406], particularly those of Christ, have linear definition sacrificed in order to stay solidly on the ground. Such confident insistence on the observation of natural

shadowing on Masaccio's part contrasts with works of the century before, when clarity of form was more preciously sought. The shapes of feet in Duccio or Ugolino di Nerio's panels [Pl.291 & 300], for example, are either crisply separated as darker silhouettes, or have sharply drawn outlines where foreground and background tones are similar. Drawing and form are sharply made and given clear priority.

While these foot shadows are, or could be, noticeable, similar proximity shadows could occur elsewhere. The touch of a hand or fingers is likely to have associated shadows too. We might see these occasionally but they only seem to appear through accident rather than intention, and any examples do not prompt further continued use. For example, Pietro Lorenzetti in the central *Madonna and Child* of the 1320 Arezzo Pieve altarpiece [Pl.315], shows Mary's left hand in immediate contact with the Infant Christ's robe with a convincing impression of shading resulting from this intimate contact. The depressions in the fabric around the fingers are carefully modelled to give a local tonal sense of recession around the fingers and the dark tones of a strongly modelled hand are allowed to blend with the quite similar tone and colour of the fabric. But elsewhere Christ's hand and Mary's right hand, find their fingers against a lighter fabric and no sign of local contact is essayed in terms of tonal control. In his later, 1340, *Madonna and Child with Angels* [Pl.317], similar contact between Mary's hand and the Infant's robe does not find shadowed tonal expression in the same way. However, in this same painting Christ's hand on Mary's chin does apparently attract a local close proximity shadow. But the result is evidently accidental, being explicable by a need to distinguish between fingers and chin. The chin, as the more distant element, is darkened to give a local phantom shadow. Further scrutiny shows that, while some convincing mimics of actuality might have occurred gratuitously in the paintings of such an adventurous painter as Pietro

Lorenzetti, these are not pursued further in his work, let alone in that of others who followed him. Once more we must look to the Quattrocento and Masaccio before this particular sophisticated shadow technique starts to be given conscious employment in Italian painting. In the Masaccio *Madonna and Child with St. Anne* [Pl.404 & 405], Mary's hands are seen, through local shadows, to be in direct and credible contact with the infant Jesus' leg. But even here, while this was clearly a positive statement by Masaccio, there are also signs showing avoidance of any depiction of integrating contact. St Anne's right hand rests on Mary's white head shawl but there is no shaded evidence of this. Even if the practice of looking for, and registering, these effects did become more common this happened slowly, and yet other 15th century painters still followed the habits of the Trecento. Sassetta, for example, in the 1430-40's would provide crisp "cut out" figures with no contact shadowing, even while exploring cast shadows in his *Stigmatisation of St. Francis* [Pl.419].

With no cross shadowing between subjects, including that between subjects and the ground planes on which they rest, and no proximity shadows to tell of immediate contact in 13th and 14th century painting, the separate depiction of elements leaves their forms isolated. In this, modelling and the handling of light and shade are consistent with, and effectively part of, the system of *absolute colour* as described by J.Shearman.² Colour and tone are related internal matters. So figures, or parts of figures, are self-sufficient units, and, assembled together paratactically to make a picture, still remain unconnected and autonomous.

Isolated examples of hard edged shadows in Trecento painting

There were signs of a 13th and 14th century awareness of distinct shadows in literature, as in the works of Dante, or in academic texts of philosophers such as

Bacon or Pecham,³ but any illustrations in painting which can be definitely recognised as cast shadows are few and far between. Nonetheless, there are a few examples which stand out as seemingly consciously created among the many false or accidental shadows.

Earlier it was suggested that conventional shading practice could have combined with attached shadowing on faces to allow a local development of near illusionistic modelling in this area (see Chapter 3 pp.157-160). However apart from the apparent registration of the soft shadow of nose on cheek there is little sign of cast shadows on humans. One exceptional adventure occurs in the S.Francesco Upper Church. *St Francis Renounces his Heritage* [Pl.196] has St.Francis' arm clearly casting a shadow on his naked torso. But such an effect is isolated and not apparently repeated until the 1420s when Massaccio's Infant Christ in the Pisa Altarpiece [Pl.409] has similar arm shadows on his body.

Elsewhere, in S.Francesco, Assisi, Pietro Lorenzetti did offer, among a number of adventurous essays, distinct cast shadows from firelight for a dog and cat in *The Last Supper* [Pl.309]. But he stops there and no shadows are shown for the adjacent human servants. He continues, in the same *Passion* cycle, to experiment with some inanimate shadows, but noticeably well away from human figures. In *The Entry to Jerusalem* [Pl.306] some brackets, and the awning poles they support, have carefully described shadows thrown on the wall beside them. These, not only follow the complicated three dimensional geometry of the poles and brackets themselves, but also, at one point, accurately negotiate a receding corner on which the shadow of these falls. A further turn of the wall thwarts the continued success of this exercise, but the conclusion cannot be avoided that some close observation and reporting of the detail of actual shadows had been made. Adjacent to this, some shields, hung as decoration,

have their proximity to the wall marked by clear shadows. Below these successful essays a stairway is depicted with a shadow placed behind it. The shadow in this case appears to be cast upwards, registering higher on the wall than the stair itself. But a closer look, focusing on the slightly uncomfortable linear perspective here, suggests that the error could result from a locally different, and higher, point of view being taken of the stair itself allowing the attendant shadow to show. Error or not, it clearly was intended as a shadow, and not a local tonal adjustment for recession, since its edge is very cleanly defined. Elsewhere, in the south-east corner of the south transept of the Lower Church, Pietro continued experimentation. His celebrated *trompe l'oeil* bench [Pl.314], and the fictive niche in which it is set are given some sense of reality through the shadow cast on the side of this niche. What is also worth noting in this is that, though a sharply defined shadow of one arm of the bench is shown on the adjacent wall, no shadow from the other one is allowed to disturb the significantly prestigious pattern of the soft vair fur spread within the seat itself. Iconographic importance or aesthetic considerations might have inhibited this exercise. This relatively concentrated experimentation at Assisi did not herald any further development in hard cast shadows, either in general working or in Pietro's own later pictures. They stay virtually absent in what we have of his subsequent work, only one recognisable shadow recurring later in a minor panel of the Beata Umilità Altarpiece of c.1340 [Pl.318]. But even in this the clearly defined ground shadow from one side of a supporting arch is not carried through onto the other side wall. Reticence is apparent even in this adventurer's working.

While no general concern for cast shadows was aroused by these earlier essays some inquisitive interest continued to tempt a few painters to test the phenomenon in painting from time to time. A singular and spectacular appearance of hard cast shadow

arises in Taddeo Gaddi's *Annunciation to The Shepherds* [Pl.260], c.1328, in the Baroncelli Chapel of S. Croce, Florence. The strap of a water bottle is crisply described in the shadow thrown forward on to the hillside. No other cast shadow is recorded, for shepherds, animals, trees or hillside, and this despite the clear attention paid to other directional aspects of light in the insistence on light radiating from heaven or the angelic apparition (see Chapter 8 p.374-375). Again the effect is an isolated adventure and prompts no further interest. A further exploit by Tomaso da Modena in a picture of *St Jerome* [Pls.385 & 386], from the 1350s, offers very precisely observed shadows of nails with an ink bottle and quill box hanging on them. This is in a context where, with the furnishings of St Jerome's cell linearly described, a set of local recessionary gradations of tone pushes back planes in a coded way creating pseudo-shadows elsewhere. Then Altichiero, c.1380, offers experimental hard cast shadows of a window's shutter and grille in the background to *St. Lucy before Judge Pascasio*, c.1380 [Pl.372]. The sharply drawn forms in these experiments make their nature unambiguous. Nevertheless, the impression is of isolated idiosyncratic departures from a norm which avoids such effects. No echo of their spectacular appearance is to be found in any serious pursuit of painted cast shadows from central human figures before the second decade of the 15th century with Gentile and Masaccio. Gentile's *Stigmatisation of St Francis* [Pl.398] shows crisp shadows of brother Leo and the hard shadow of St Peter is an element essential to the narrative in Masaccio's *St Peter Healing the Sick by his Shadow* [Pl.408].

Ceiling penumbrae and soft shadows

One effect which does bear some scrutiny as cast shadow is the softly graded penumbra which features in many Trecento works. As a term for semi-shadow,

penumbra applies, when we have a large area light source, to those areas of gradual transition between the total exclusion of light, that is full shadow, and points where the shaded surface receives unobstructed light (see Chapter 1 p.52). An overhanging obstruction, say a balcony, interfering with such soft overhead illumination, perhaps on an overcast day, causes just this form of shadowing on an associated wall. Immediately under the projection there is little or no influence from the sky and no light, while further down progressively more light reaches the wall, until we find the surface fully lit. The effect is essentially an exterior phenomenon, appearing under balconies or below the roofs of loggias, external recesses or niches. With some licence it was also pressed into a standard usage for interiors, but there it had much less naturalistic justification (see Chapter 6 p.319).

Early indications of these effects might possibly be discerned at the close of the 13th and beginning of the 14th century, when they made a limited appearance in the Assisi Upper Church. Traces appear in the loggia and aedicule of *The Ordeal of Fire Before the Sultan* [Pl.201], and the niches of the *Pentecost* [Pl.190] have similarly tentative signs of its use. Such evolving shading can be seen here as an extension or development of the shading of the underside of arches which was also a feature of a number of Assisi Upper Church nave frescoes. The device itself was more obviously explored in the Arena Chapel, in the first decade of the Trecento. There it was employed effectively below ceilings, roofs and other projections and significantly Giotto employed the stratagem, in varying degrees, not just for exteriors but for every interior, apart from the torch-lit *Jesus Before Caiaphas* (Chapter 8 pp.387-390). For Giotto and his immediate followers it became a well used procedure, offering, in their work, attractive suggestions of vertical orientation, stability and weight to interiors as well as for exterior architecture. It subsequently appeared, but with differing degrees

of emphasis, in the Giotto workshop, *Life of Christ* frescoes of the north transept of the Assisi Lower Church, painted in the second decade of the Trecento. Here some variations in application are indicative of further experimentation, or perhaps of different painters' approaches in different frescoes, since a number of different artists were clearly involved. The *Massacre of the Innocents* [Pl.239], employs it lightly. But then both *Jesus Disputing with the Doctors*, and *The Presentation in the Temple* [Pl.241] make more use of it. The latter illustrates an obvious but unconvincing attempt at describing some soft cast shadows by letting the shading correspond to the shape of the vaulting.

Such shading effects were not universally taken up by all painters. For example, in the next painting campaign in Assisi's south transept, which followed the Giotto workshop project, there is little sign that Pietro Lorenzetti favoured this effect.⁴ Soft ceiling shadows do not feature much in his works, here or elsewhere, though he does show some understanding of the basic idea which prompted them. He follows the common idea of the expectation of light being from above, by treating the undersides of arches to graduated shading. It would seem that, in this, Pietro Lorenzetti is following Sienese examples. There, the major early Trecento influence, Duccio in his *Maestà*, gave no indication in interiors or exteriors of any ceiling or roof shadows, even if he meticulously shaded the undersides of all arches. The panel showing *The Healing of the Blind Man* [Pl.298], for example, has no modulation of tone *under* the roof of the deep recess behind the first three disciples. This absence is made all the more noticeable by some pronounced shading, which, in pushing back the left rear wall of the recess, comes close to appearing as a horizontal, not a vertical, cast shadow. Ambrogio Lorenzetti was rather more flexible and selective in his employment of such effects, perhaps betraying at times more Florentine influence. He

provided, in *The Presentation in the Temple* [Pl.334], another demonstration of an interior almost, but not quite, free of ceiling-shadows. His *City of Good Government*, [Pl.323], 1338-39, shows, for exteriors, some restrained use of penumbrae on overhanging roofs, but within the various open *botteghe* shown here [Pl.324] there is little or no sign of its use. Earlier, when painting some narrative side panels on *The Life of St Nicholas*, c.1330-2, for San Procolo Florence [Pl.320], he had provided some interesting, if very finely noted, soft overhead shadows for interiors and exteriors. Simone Martini, too, was selective in making very limited, at times only just perceptible, use of these ceiling penumbrae in the St.Martin Chapel of the Lower Church. at Assisi. *The Knighting of St Martin* [Pl.341] has, for instance, no signs of penumbral effects in the main chamber but, deeper into the picture, the vaulted aisle is treated to them.

The regular use of these penumbral shadows carried on through the Trecento, particularly in works of Giotto's circle and Florentine followers. Taddeo Gaddi made full use of them in the *Life of Mary* frescoes in the Baroncelli Chapel, although he also demonstrated, in this, some signs of further development. *The Presentation of the Virgin* [Pl.262] has ceiling shading giving weight and vertical orientation to the skeletal rendering of the temple, but it is no general over-veiling shading. Local modelling of the vault ribs modulates the darker upper regions of the church interior in a step towards following the actuality of light there. This is quite different from the simple formulaic darkening of the underside of arches, produced, seemingly automatically, on through the late Trecento by those painters, for example Paolo di Giovanni Fei [Pl.397], who followed the Sienese traditions of Duccio and Pietro Lorenzetti. Taddeo's modulated penumbrae approach continues in later Florentine works like those of Giovanni da Milano, 1365-70, in the Rinuccini Chapel, [Pl.267] or Agnolo

Gaddi's c.1380 frescoes for the Cappella della Sacra Cintola [Pl.389]. Elsewhere another Florentine trained painter Giusto de'Menabuoi was demonstrating some ambivalence in the matter. In the Padua Duomo Baptistry some of his interiors have no sign of ceiling penumbrae, while others, *Christ among The Doctors* [Pl.381] for example, show touches of them. But here he offers some ambiguous differentiation of tones in the vaulting, with lighting details being lost in Giusto's quite precious concentration on linear execution. Other some attempts at naturalistic reporting in this sphere appears in Padua. Altichiero provided delicate ceiling shading with some credible modelling of vaulting, and in one instance, demonstrated a very perceptive observation of actual lighting effects high in a church interior. Above St. George in *St. George Baptising King Sevio and his Court* [Pl.373], lighting from a clerestory window on the left is shown to model the ribs and mouldings effectively and to convincingly punctuate the darkened upper registers of the interior in a credible way. However the seemingly automatic application of the penumbral pseudo-shadow continues into the early 15th century. Gentile da Fabriano makes use of it in the *Adoration of the Magi* altarpiece, where, in the predella *Presentation in the Temple* [Pl.402], its standard appearance alongside more realistically observed effects, demonstrates its artificial nature. Accurately reported sharp shadows of the arch tie-bars appear in the loggia. Consistent with these there should have been hard shadows of the arches themselves, but soft penumbra appear.

Besides the ceiling penumbrae a few other soft shadows of a similar nature appear in the Trecento, ones which are effectively smaller versions of these ceiling or roofs shadows. These occur, below interior furnishings, tables, benches or beds, as localised versions of the same phenomena. Only one or two, however, stand scrutiny as consciously painted shadows. In the Arena Chapel, some likely attempts appear.

The Birth of the Virgin [Pl.219], has distinct dark shading and that below the bed is clearly meant as dark void merging into soft shadow. For the similar *Annunciation to St. Anne* [Pl.218], the heavy tones below the bench and chest are also likely examples of shadow. The shadow and shading below the bench, is somewhat gross and may be over stated, but it is particularly effective in telling of a substantial extension into the picture space below the bench. The fictive dimension implied by the depth of tone here confirms the severely foreshortened upper surface. Indeed the extreme foreshortening might well have gone unnoticed if the dark void below had not been so positively treated. The heavy shaded accents below the chest, on the right, follow the line of its base, rather than showing any gradation into the picture, to suggest shadow, rather than recession. These shadows do offer solid tonal foundations for the pieces of furniture and, read together with the lighter planes of their upper surfaces, provide, in tangible suggestions of solid existence, quite convincing evidence of volume and depth. Another effective if quite small shadow in this fresco is that at the bottom of the curtain. This places the fabric in front of, but distinctly separate from, the bed woodwork. Other examples of furniture shadows appear below the benches of the disciples in *The Pentecost* or *The Last Supper* [Pl.226 & 227]. These might be argued as simple, and local, tonally coded recession. However, the areas are quite definitely held down in tone overall and the detailed gradation, on bench supports, carries some soft vertical variations, as well as nominally recessional ones, consistent with a top-lit penumbral shadow pattern. In another isolated instance of around 1326 Ambrogio Lorenzetti offered some very similar but harder shadows for a bench in *Louis being Received by Boniface VIII* [Pl.322]. If these few trials indicate some tentative exploration of another aspect of shadow, there is, once more, little later sign of any continuing interest to pick up the idea and take matters further. Some spurious

shadows do occur from gradations of tone on receding floors which seemingly provide similar results but I will address these shortly in a separate section.

Of course, soft shadows do not result only from overhead lighting they also occur with soft sources incident from the side. An open door or window can provide the necessary illumination for this. We have already seen that such soft directional lights and their shadow and shading effects are, by the opening decades of the Trecento, being recorded with varying degrees of naturalistic accuracy for faces. For other subjects, buildings for example, this is generally not the case. But even here among a great number of misleading false shadows some isolated signs of the deliberate consideration of soft shadows can be discerned. Three pictures of the interior of the Temple from the upper register of the Arena Chapel, *The Wedding of the Virgin*, *Presentation of The Branches*, and the *Prayer for the Flowering of the Branches* [Pl.222] all show positive attempts in shading to follow the apse wall behind the altar in a naturalistic way. The shading does not conform to a recessional code, which would require the deepest point of the apse to be darkest. Nor is the graduation linear, as it is for the ceiling penumbra on the wall above. The tonal modulation traces out the curvature persuasively from left to right to describe the semicircular wall of the recess. Strictly it is not all cast shadow. It is more complex, with self shadowing and tilt shadowing running into soft cast shadow, and the transition from self shadow to cast shadow is a moot point here. Be that as it may, these essays apart, there is little other signs of positively generated soft architectural cast shadows, other than the ceiling or roof penumbrae to be discerned in Trecento.

False shadows

While a few experiments provided consciously depicted cast shadows in the Trecento, many apparent shadows prove to be spurious on detailed examination.

In the Upper Church at Assisi one is tempted to see some early signs of cast shadows. One informative instance of these is *St Francis before the Crucifix* [Pl.192], in which we view a ruined church presented as an accessible interior combined with exterior elements. The central part has the common, “near wall removed”, view of an interior, in this instance lent some credibility by its context of partly demolished roof and surrounding broken stonework. The basic light and shade distribution conforms to a fall of light from right to left, from the east window, and is consistent with other frescoes on this part of the nave wall. On the left there might be a hint of a shadow from the ruined upper wall on the inner church, but this, on further investigation, is clearly the result of damage to the left side of the fresco.⁵ On the other side there are indications, at first sight, that the tonal treatments associated with the right hand pillar and the ragged edges of the wall above it, provide a real sense of shadowed depth to their left. Both pillar and remnant of wall seem to cast shadows which closely approximate to their outlines. Unfortunately the wall to their right, while itself well modelled, casts no such shadow on them. Looking further there are other effective attempts at tonal depth, but also still more inconsistencies in the patterns of lighting within the fresco. The interior behind St.Francis is suitably darkened, recording in this case a dim interior situation, where decreasing values of tone can legitimately suggest recession. Then the general sense of lighting direction, from the right hand side, is pursued for much of the lower part of the scene. This models Francis, pillars and the three corbels coherently. Beyond this other items have their own, seemingly, arbitrary shading logic. The roof corbels, or dentils, are lit from the right but with shadows

falling to the right, while the three decorative roundels just below these are modelled as if illuminated from directly over head. The narrow strip of stylised coffering above Francis takes its light from the left. But this last device is quite likely to be merely a conveniently repeated piece of standard shorthand to help rapid work shop production, for it appears in the same identical form throughout the entire fresco cycle and in all the fictive framing. Above the church the roof tiling seems to tell of an older pattern of near edges being lightened. This archaic intrusion is really part of the Theophilus code (see Chapter 1 p.68-69) and offers no real evidence to assist, or contradict, the lighting plan round Francis in the church below. Noticeably in all these cases, even if there are, at first sight, suggestions of shadows, in no case is a clean sharp shadow allowed to offer an additional confusing line to contradict any originally drawn shape. Line and form have priority. Still, even if we might not expect to see hard shadows for this reason, we might be tempted to think we are looking at less intrusive soft cast shadows. But are there really any soft shadows there? Investigation indicates that this is not the case. Any “shadows” which we see could have arisen from a straightforward use of tone to try to generate a sense of depth by tonal separation of planes.

To investigate this possibility we can look again at the mid-wall corbels [Pl.193] Closer scrutiny show these to be modelled, like St. Francis, as for lighting from the right. They have, however, lightly indicated *reverse* cast shadows falling towards the right. The “shadows” here, are accidental side effects of a stratagem to distinguish between planes of similar tonal value and yet again the “light advances, dark recedes” rule of thumb is being invoked. The right hand assembly of pillar and ruined wall then makes sense. The strong “shadows” to the left of these result from the darker inner church walls being locally pushed back by tone behind the serrated edges of broken masonry and in following the irregular profile appear to duplicate the shapes in

shadow. The jagged wall on the extreme right is shaded to seemingly simulate “self shadowing” since the broken face, as more prominent, is lighter. This leaves the surface presented to us as darker and, as it is then conveniently lower in tone than the pillar, it has no need of local darkening to indicate its slightly greater distance. So no depiction of cast shadows is required to explain this distribution of tones. Elsewhere the shading on the right side of the apse might come close to offering a semblance of shadow, but it is not as convincing as those slightly later apses in the Arena Chapel Temple sequence [Pl.222] (noted above p.413) and is probably following tonal recession control rather than anticipating a true shadow. Such comparison suggests, though, that this Assisi apse shading might well have prompted the later more successfully illusionistic depiction in the Arena Chapel.

Elsewhere in the Upper Church what seem, at first sight, to be other applications of soft penumbral shadowing, prove on investigation to be accidental effects. There is one example below the covered stairway behind St Francis’ father in *St. Francis Renounces his Heritage* [Pl.195]. But no other similar shadows are reported in this fresco, even though there are other ceiling or roof projections. The difference between those projections with and without “shadows” is in angle of view. From a low viewpoint the junction between any overhang and wall surface is visible and early linear perspective techniques allow the transition of planes to be indicated by the sloping lines setting the upper limit of the wall and the far limit of the soffit. With a locally higher view point, we look down on the stair and its roof projection. This results in the direct juxtaposition of planes at different distances. No linear clues can help here. Different tactics are needed and tone is adjusted at the boundaries to point to the wall being at some further remove from roof or stair. So once more shadows are

gratuitously provided by the local application of the “light tones project and dark tones recede” rule.

There are still other deceptive instances of cast shadows within the St Francis cycle. A particular case is remarked on by Tintori and Meiss.⁶ In the scene, *St. Clare Grieving over the Body of St Francis at Damiano* [Pl.211], they observed areas of shading alongside the sculptures of prophets on the pediment of the church. These were interpreted as “primordial cast shadows”, precociously reported, even although it was noted that they fell to the left of the figures and the rest of the scene is lit from the left. This though is somewhat fanciful and it does seem more likely that, once more, the tactic of pushing back the background by local use of a darker tone has provided phantom shadows. The very light tone of the facade made these side effects particularly obvious in this instance just as it did for the corbels, noted above, in the ruined Church. Nowhere else does such a technique appear in this form in the Upper Church. However, a further suggestion by Tintori and Meiss that some broader shading alongside roof brackets in *St. Francis' Appearance at Arles* [Pl.206], though falling contrary to the general light direction, might well be argued as an essay in soft cast shadows, rather than as a tonal separation device. Here the width of the shading varies with that of the brackets to mark out a shadow-like projection of these brackets.⁷

Outside, but adjacent to, these Assisi narratives, other reverse “shadows” appear. Above and below the cycle frescoes they occur on the decorative fictive corbel tables [Pl.194]. These are just like the corbels on the wall above Francis in *St. Francis before the Crucifix* [Pl.193], but here a large number are closely aligned together in a continuous frieze. The fictive architectural projections, each viewed diagonally as converging to a central point or axis, display modelling of planes for one lighting direction while alongside a pronounced “shadow” tells of an alternative direction. The

spurious shadows all coincide with the need to show the slightly more distant planes, behind each projecting bracket, as being darker.

In Duccio's *Maestà* another isolated but very obvious incidence of spurious shadowing occurs in *The Annunciation of the Virgin's Death* [Pl.280]. The lectern's colour and tone are so close to the background that a dark nimbus is provided around it, overtly indicating distance differential by tonal changes. The tones below the ledge and to the right of the stand might readily have been taken for shadows, though some fall against the light. However, the shading extends above the lectern. So in this instance the device, all around the foreground object, is so obvious that it cannot be mistaken for a cast shadow.

While the notion of receding planes carrying graded reductions in brightness was not generally seen for walls (see Chapter 6 p.288), it did feature for floors and here could gratuitously provide false impressions of soft vertical shadowing. In the Duccio *Maestà's Wedding at Cana* [Pl.297], the floor's tonal value tapers off as it continues into the room, though the broad table itself has no similar variation, and a soft shadow might be read below the table. But the tonal transition extends over much more of the floor than does the area seen as being under the table. Additionally no impression is to be found of the shadow's on-set. Pietro Lorenzetti, who as noted experimented with shadows has in his 1342 *Nativity of the Virgin* [Pl.319] a graded floor which darkens noticeably to a pseudo-shadow, but the relative position of the "shadowing" object, a bedside chest, doesn't quite correspond to the transition we may strain to see. His brother, Ambrogio, in his *Presentation in the Temple* [Pl.334], of approximately the same date, shades a similarly tiled floor in just the same way. In this case there is no overhanging obstruction and hence no temptation to read a possible shadow into this.

13th and 14th century reticence in the depiction of cast shadows

There was intelligent awareness of shadows as physical phenomena in the 13th and 14th centuries. Besides the theoretical considerations by scholars, as a part of the study of light (see Chapter 1 p.66), there were other signs of a more general understanding of cast shadows in Trecento writing. Dante Alighieri exhibits some keen appreciation of them and this is well illustrated in his *Divine Comedy*. For example, in Canto III of *Purgatorio*, he describes his shadow projected forward by the sun and to help set the geographic detail of his narrative, he carefully reports the direction of his shadow with respect to the early morning sun and the mountain of Purgatory.⁸ Significantly, the *Divine Comedy* was written in Italian, not the Latin of the scholar, so that artists' access was possible, and if we are to judge by the many pictorial references to *Inferno* many painters had some knowledge of it. But no similar careful recording of shadows appears in contemporary painting and there was an apparent reluctance to reintroduce cast shadows in Duecento and Trecento paintings. This is all the more intriguing in a time when obvious moves towards an art of illusion prompted a very energetic exploration of the representation of light and its effects in a number of other ways.

This apparent reticence in the observation of cast shadows requires explanation. P.Hills offers an answer, convincingly pointing to the traditions of Platonic philosophy continuing to condition thought, and suggests that “fourteenth-century inhibitions about rendering cast shadows must have been at root epistemological. If vision is fallible, why add to the dangers of deception by rendering the shadow as well as the substance?”⁹ This is indicative of the underlying Platonist position of leading scholars and theologians in the early Church, still prevalent in the 13th century and with some

broader reflection in the thoughts of people in general.¹⁰ True there was, in the 13th century, a critical change in philosophic thinking, apparent in the works of Grosseteste, Bacon, Pecham and Thomas Aquinas, which turned, through Aristotelian approaches and nominalist views, to more material considerations of our physical world and away from the *ideas* and *forms* of “the Platonic tradition, which for centuries had moulded the imagery of cognition, ...”¹¹ But the traditions of past centuries still conditioned many habits of thought.

The notion that philosophic considerations could directly affect the techniques of 13th and 14th painting might seem fanciful, but aspects of Platonic thought do have reasonable parallels in some medieval painting practice. From a Platonic view the *Idea* or *Form* was all important and represented ultimate truth and reality. The particulars, or ordinary objects, of our world were inferior reflections of these universals, and their painted representations were still further distortions. In relating this to matters of every day perception, the transitory accidents of this world, light effects included, are seen only to obscure the invariable truth of essential form. Translated into practical terms the concept of Platonic universals or ideal forms can equate with a traditional and continuing dependence on drawing and the relegation of shading and colour to a secondary role. The depiction of formal truth was an important part of pictorial communication. If its representation was not to be distorted the essence of a object should be displayed with unambiguous characteristics linearly defined. The accidental effects of light, being transitory, were hardly indications of the enduring reality of the object to be depicted. The artist then looked beyond, or through, the attendant shadows to determine and report the true substance of any subject. These shadows were transparent or “tuned out”. Cennini, though speaking in part metaphorically, reflected the practicalities of this in the opening page of *Il Libro dell'Arte*. A painter’s

imagination and skills were to be used “to discover things not seen, hiding themselves under the shadow of natural objects, and to fix them with the hand, presenting to plain sight what does not actually exist.”¹²

But from around the turn of the 14th century artists had been reaching out for an art of illusion and some semblance of actuality, and indeed Cennini reflected this in advocating copying from nature and following natural light and shade.¹³ Here the more pragmatic approach in depicting the realities of this world meant that the Aristotelian changes in scholarly approach were in large measure anticipated by perceptive artists. The tension resulting, between following old ideas and aspiring to the new, is arguably illustrated in compromises and limitations in the depiction of shadows.

Variable levels of the encroachment and acceptability of shadows are discernible. The hard cast shadow was avoided completely for central elements. In requiring its edges to be defined it would add extra spurious lines which might confuse, and even contradict the *bona fide* lines which defined the intrinsic shape, as understood and recognised by artist and viewer. The few isolated experiments registering hard shadows took place well away from any important human subjects. The use of a soft shadow, as in the gentle penumbra, was restricted to backgrounds and its slow gradation offered no abrupt transitions, as extraneous linear elements, to offer competition to, or confuse, the drawing of foreground figures. Then any figural soft shadows were simply self shadows and contained within the limits of each separate figure. No cross shadowing was allowed to interfere with another form. At the same time, the contrast of these self shadows was restricted to leave the drawn information clearly legible. Much of the above follows from a preference, implicit in all Trecento painting, for a soft diffuse illumination which automatically avoids harsh shadow lines. Cennini’s advice, registering such practice, was to “arrange to have the light

diffused when you are drawing,”¹⁴ Such advice was repeated later, with more informative amplification, by Leonardo. “Light cut off too obviously by shadows is condemned severely by painters. Therefore to avoid such unpleasantness, if you portray bodies in the open country, you will not paint their forms as though illuminated by the sun, but pretend that there is some sort of mistiness or transparent cloud placed between the object and the sun. As the figure is not sharply illuminated by the sun, the edges of the shadows will not be sharp against the edges of the lights.”¹⁵

From a little more practical point of view another aspect of drawing must have provided an obstacle for more pronounced employment of shadows or strong realistic shading. By the turn of the Trecento the pragmatic pursuit of linear perspective had provided painters with relatively successful indications of recession and fictive space. The hard won achievements here were precious preserved. Having realised a satisfactory semblance of recession for planes and foreshortening in figures it would have taken a very single minded insistence on mimicking strong shadows to obscure the controlling formal outlines under heavy shading, or to add the extraneous lines of hard shadows’ edges at conflicting and confusing angles. All examples show that such a sacrificing of the products of good drawing practice were not made until the Quattrocento.

Superstitions and supernatural factors must be assumed to be instrumental in any selective 13th and 14th century depiction of shadows. It is, though, difficult to determine any real and definitive pattern of their effect on discriminating execution, and this is not helped by clear ambiguities in the period’s understanding of shadows’ extra-natural properties. The established iconography of what was still an essentially church centred art had built into it the traditions of a religious past which equated light and divine enlightenment. Indeed, the word “enlightenment” here is indicative of the

lasting legacy of this religious past even today. Light features in much of the text and teachings of the Scriptures. Jesus said “I am the light of the world : he that followeth me shall not walk in darkness.”¹⁶ But one aspect of light’s absence, the cast shadow, could be noted as having positive effects. There is an important instance in the Annunciation story where Gabriel explains Mary’s coming conception by saying to her “... and the power of the Most High will overshadow thee.”¹⁷ The c.1260 *Golden Legend* —an influential work and a major late 13th century guide for artists illustrating biblical narratives — writes on possible meanings of shadowing in this context, including interpretations by St.Bernard, but offers no definitive explanation.¹⁸ But the shadow as divine instrument or token in a central event of the Christian narrative is seriously considered. However, no attempt to directly illustrate this important shadow in any of the many Duecento or Trecento paintings of the Annunciation is apparent. Duccio’s version from the *Maestà* [Pl.284] is typical of these, with beams of light rather than any shadow being used as signs of divine involvement, and indeed this visual form also continues as the standard illustration on through into 15th century. It was not until the second decade of the 15th century that any shadow’s mystical presence and potentially divine powers was to be given substance in painting. Masaccio in the Brancacci Chapel, c.1326, illustrated the legend of St Peter’s shadow curing a cripple [Pl.408].¹⁹

Apart from the Christian equation of light and deity still other connotations attached themselves to shadows. The terminology and significance was rooted in the pagan past, the distant past of the Romans and Greeks (*σκια* having the same sense and usage as *umbra*). Some of the traditions of this past were partially rationalised and given some significance, within Christian thought, as Dante’s *Divine Comedy* might show. Shadows were cast by living humans but on death the shadow remained with the

body in the grave.²⁰ The spirit continued through the underworld, or *Inferno* and *Purgatorio* in Dante's Christian version, without a shadow. However, a linguistic ambiguity arises since the disembodied spirit, is termed an *ombra*, the same word as for a cast shadow. Latin has the same ambiguity in *umbra*, while English usage allows *shade* to help differentiate as the spirit form. The problem then is that an *ombra*, a spirit, does not cast an *ombra*, a shadow, and the implications could be confusing. But in any case no deliberate sign of an illustration of such distinction by selective shadows appears. The spiritual status of the resurrected Christ, for instance, in the *Maestà Doubting Thomas* [Pl.294] is shown by chrysography (see Chapter 5 p.265 ff.), and no shadows are shown for either him or the Apostles. Similarly the Arena Chapel *Noli Me Tangere* [Pl.235] still avoids shadows for both Mary Magdalene and Christ, relying on his white robe with golden braiding to signify His Deity, and a near copy of this in the Assisi Lower Church Magdalene Chapel does the same, but adds an overall aura of golden rays as further token of His divinity.

Other, perhaps still more atavistic, superstitions might have played their parts. But it is the nature of these to be not just recondite, and our texts don't help here, but also arbitrary and irrational. Uninformed interpretation is frustrating and unsound conjecture can only add a further factor to the uncertainty of interpreting pictures. What, for instance, can be made of Pietro Lorenzetti's showing of shadows for animals, but not of humans in his Assisi *Last Supper* [Pl.309]? Was this purely arbitrary or was there some superstitious element to it that allowed an adventurous artist, in taking liberties with the shadows of animals, as distinct from those of human beings, to experimentally portray the actuality of visual phenomena ?

Perhaps this last example could point to a more straight forward discrimination, which, if not quite superstitious, could be seen to follow from an assessment of

spiritual and personal priorities. The selective employment of shadows, or rather their avoidance, follows an apparent rising scale of deferential handling. Shadows were acceptable for inanimates, like buildings, though these were generally soft, and any more aggressive experimentation was restricted to smaller elements or furnishings: examples here being Pietro Lorenzetti's brackets [Pl.306], Taddeo's Water Bottle [Pl.260] or Tomaso's Ink Bottle. [Pl.386]. At the same time deference to an obvious metaphor of honour might be understood where Pietro Lorenzetti has one arm of a fictive bench [Pl.314] shadowing its adjacent stone work, but the prestigious vair covering of the bench is left untouched. Then a difference in Pietro's *Last Supper* [Pl.309] had shadowing from animals but still left humans free. Later, when some more liberal approach to cast shadows for humans does appear in the early Quattrocento, a clear sensitivity to an individual's personal status is evident in Gentile's *Stigmatisation of St. Francis* [Pl.398]. Here a well defined shadow is cast towards the viewer, from a back-lit Brother Leo, while St. Francis, has a privileged separate frontal lighting with no extravagant shadows, just small contact shadows under the folds of his habit and his feet where these comes into connect with the ground.

Shadows start to appear in late Duecento and early Trecento painting and occur, though in severely limited ways, through the 14th century. Their employment is restricted mainly to soft ceiling or roof penumbrae, and hard cast shadows only occur in very occasional precocious experiments. Though evidently noted, and in some measure understood, as physical phenomena, the shadow's hesitant application in pictures seems to reflect priorities given to both linear definition and to the iconographic importance of elements.

In many cases hints and suggestions of shadows appear, but, on inspection, are no more than pseudo-shadows. These are the gratuitous results of various subterfuges used to control, via local adjustment of tonal values, a coded recession of more distant planes following the “light advances, dark recedes” convention. The uncritical application of this idea, that farther planes ought to be darker than closer ones, finds spurious darkening generating a pretence of shadow in many paintings. Thus, when we might now look to cast shadows to help mutually relate and connect objects and planes in three dimensional space, it was a need to separate rather than connect which turns out to be the main source of false shadows in Duecento and Trecento painting.

Chapter 9 Notes

- 1: See Introduction Chapter, p.47, note 15.
- 2: Shearman, *op.cit.*, p.2.
- 3: Dante, *op.cit.*, passim. His cast shadow, as a token of his human body, figures often in Dante's narrative. For Bacon's ideas, see Lindberg, *op.cit.* (*Bacon's Philosophy of Nature*), p.163-165 For Pecham's thoughts see Lindberg, *op.cit.* (*Perspectiva Communis*) pp.101-2, Propositions I.23 & I.24.
- 4: See Chapter 3 p.207, note 109
- 5: Tintori & Meiss, *op. cit.*, pp.90-91. Their investigation noted damage all along the left side of the scene.
- 6: *Ibid.*, p.140. The bands of shading to the left of the sculptured figures are to be, "considered primordial cast shadows, even though they imply a light coming from the right whereas the main mass of the church ... and the figures below are struck by a light coming from the left."
- 7: *Ibid.*, p.124-5.
- 8: Dante, *op.cit.*, Purgatorio, Canto III, pp. 44-45, lines 16-18 "Lo sol, che dietro fiammeggiava roggio, / rotto m'era dinanzi, alla figura / ch'avea in me de'suoi raggi l'appoggio." and pp.48-49, lines-88-91 "Come color dinanzi vider rotta / la luce interra dal mio destro canto, / sì che l'ombra era da me alla grotta, / restaro..."
- 9: Hills, *op. cit.*, p.86.
- 10: Platonic thought was an important factor in the early Church. See Chapter 2 p.125, note 30.
- 11: Hills, *op.cit.*, p.86.
- 12: Cennini (Thompson); *op. cit.*, p.1. The Italian reads : "...un'arte che si chiama dipingere, che conviene avere fantasia, con operazione di mano, di trovare cose non vedute (cacciandosi sotto ombra di naturali), e fermarle con la mano, dando a dimostrare quello che non è, sia ." Cennini (Tempesti) *op. cit.*, p.29-30.
- 13: Cennini (Thompson) *op. cit.*, Chapter XXVIII, p.15, "the most perfect steersman you can have, and the best helm, lie in the triumphal gateway of copying from nature" The Italian is : "la più perfetta guida che possa avere e migliore timone, si è trionfal porta del ritrarre di naturale." Cennini (Tempesti) *op. cit.*, p.44.
- 14: Cennini (Thompson) *op. cit.*, p.5.
- 15: Leonardo (McMahon) *op.cit.*, Vol I . p.70, and in Vol.II, Codex Urbinas, 40v-41r, the Italian is : "Il lume tagliato dalle ombre con troppa evidentia e somamete biasimato apresso de pictori onde per fugire tale inconveniente se tu depingi li corpi in compagna aperta farai le figure non aluminate dal sole ma fingi alcuna quatita di nebbia o nuvoli trasparenti essere interposti infra l'obbietto el sole onde non essendo la figura del sole espedita non saranno espediti i termini del'ombre co'termini de lumi."
- 16: Authorised Version, John 8:12. The Vulgate has "... Ego sum lux mundi : qui sequitur me, non ambulat in tenebris . . ."
- 17: Authorised Version, Luke 1:35. The Vulgate has "... et virtus Altissimi obumbrabit tibi."
- 18: Jacobus de Voragine, *op. cit.*, Vol.I, pp.199-200, discusses the text : "And the power of the Most High will overshadow thee." This according to the *Gloss*, is explained as follows : "A shadow ordinarily is formed by light falling on a solid body, and neither the Virgin nor any pure human being could contain the fullness of the deity : but 'the power of the most High will over shadow thee,' and in her the incorporeal light of the godhead took on the body of mankind, in order

that she might bear God.” Bernard seems to come close to this explanation when he says : “Because God is spirit and we are the shadow of his body, he lowered himself to us so that through the solidity of his life-giving flesh we might see the Word in the flesh, the sun in the cloud, the light in the lamp, the candle in the lantern.” Bernard also says that the angel’s words can be read as if he said : “Christ, the power of God, will conceal in the shadow of his most secret counsel the mode by which you will conceive of the Holy Spirit, so that it will be known only to him and to you. And if the angel says, ‘Why do you ask me? When you will soon experience what I am telling you!’ You will know in your self, you will know, you will happily know, but the One who works in you will be your teacher. I have been sent to announce the virginal conception, not to create it.” Or, “*will over shadow thee*” means that she would be kept cool and shaded from all heat of vice.

- 19: Authorised Version, Acts 5:15, “. . . they brought forth the sick into the streets, and laid them on beds and couches, that at the least the shadow of Peter passing by might overshadow some of them.” The Vulgate has : “. . . in plateas ejicerent infirmos, et ponerent in lectulis ac grabatis, ut veniente Petro, saltem umbra illius ob umbraret quemquam illorum, et liberarentur ab infirmitatibus suis.”
- 20: Dante, *op.cit.*, Purgatorio, Canto III, line 25-26, Virgil explains his shadow is with his dead body in the grave in distant Naples, where it is already evening, “Vespero è già colà dov’è sepolto / lo corpo dentro al quale io facea ombra : / Napoli l’ha . .

CONCLUSION

It is clear from an examination of their paintings that the invention, or reinvention, of pictorial illusion was an aim of Italian artists at the end of the 13th century and beginning of the 14th. “Any invention relies on certain conditions without which it would have been impossible. The first of these is that the end towards which the invention is directed should be considered desirable — in this case that the systematic recording of visual phenomena should be seen as a worthwhile goal. A second general precondition is that the invention should be attainable in terms of the necessary levels of understanding and skill.”¹ A need to offer the personalities of Christian Scripture and other venerated characters, like St. Francis, in credible and accessible images was one underlying motive behind the achievements of late Duecento and Trecento Italian painters. Following “the striving for ‘domestic’ naturalism in religious art in response to new kinds of devotion . . . an illusion of how things appear was desirable.”² As for the skills and mechanisms to effect the invention of such illusions, these together with indications of the thinking involved are apparent in the paintings of the Duecento and Trecento.

Faces, clothes, architecture and landscapes, as mimicked in semblances of light and shade, all developed in their own ways and at different rates, as did some early intuitive attempts at linear perspective. But at the same time there was an obvious general intention to realise, not just local mimesis of solid objects on the picture surface, but to seek composite illusionistic representation. The overall strategy here seeks, in many works around the turn of the 14th century, to provide a sense of overall reality and the integration of figures and their surroundings within painted scenes, largely through the coherent depiction of directional light. While, for some, this remained restricted within each panel or fresco, the very obvious and conscious

attempts to make the fictive light march with the natural light in many churches or chapels show that there was an unquestionable intention to provide illusion around the last years of the Duecento and the start of the Trecento.

Some loss of interest subsequently appears in a turn to a more surface conscious art in the late 14th century, particularly in Tuscany, which concentrated more on the painting as an object in itself rather than as an illusionistic exercise. But this shift in objectives still found the individual elements used as locally realistic items, each with its discrete light and shade treatment following the established early Trecento procedures, even though they might be combined in compositions where any asymmetry arising from natural depiction of overall lighting in the scene as a whole was avoided or modified. The symmetrical images of Coronations of the Virgin are illustrative of such choices. Nonetheless, signs of continuity of the consideration of overall directional consistency, and so intentions of illusion, is apparent in some of the works of painters like Guariento and Altichiero. The early Quattrocento, with Masaccio and Gentile da Fabriano, subsequently sees a general revival in interest in the positive reporting of directional light and a renewed interest in overall illusion. The innovations and rediscoveries of the Duecento and early Trecento ground work are then taken up and developed fully to realise 13th and 14th century aspirations in the 15th and 16th centuries. Any assumed teleological interpretation of the earlier developments would seem justified, as the end of an illusionistic art conditioned much of the early incremental movements towards its realisation.

Close examination of Duecento and Trecento paintings offers a wide picture of the mechanics and complex timetable of change and reaction. Paradoxically it offers signs of some recurring inventiveness, while at the same time indicating a continuing adherence to standard procedures and, or exemplars, and in the process offers a sense

of the balance between such adventurousness and conservatism at different periods. A variety of influences can be looked at as helping, or hindering, the evolution of tactics in the realistic depiction of the different elements in paintings. Of these there is a common assumption that for late medieval painters “the imitation of earlier artistic models rather than reference to visual experience was the dominant influence”³. Cennini confirms such practice, though he cautions that careful selection of works by the best masters is needed.⁴ This is appropriate, and in many ways essential in a commercial painting environment, as a guaranteed way to provide the expected product for customers. Beyond that, in a period of limited literacy, the repetitive teaching of standard practices, and adherence to rules of thumb, also ensured an acceptable quality of work in the workshop and hence economic success. Such procedures could certainly seem true of the largely technically derivative works of much of the late Trecento and are apparent in early Duecento works. But then, any examples and procedures that the later 14th painters followed were new standards and conventions set in the early 14th century and these, as innovations, suggest early or immediate examples were rejected, at least in part.

The few decades which produced these new ways of working were a singular time of change, and in consequence, much of my study found itself centred on this period. In this inventive time it was more than the transcribing of exemplars which let many innovations take place. Here some Byzantine influence, direct or indirect is highly likely, and, in fact, as became more and more apparent in seeking precedents, it was Byzantine art that, through the centuries, maintained worthwhile continuity with the antique past. However, while such influence may have prompted new thoughts it is clear that even in the short twenty or thirty years between the 1270's and the start of the 14th century Western painters had moved well beyond the simple copying of any

possible Eastern models. Some reassessment through reference to nature and observation is apparent. The techniques generated during this period, which seem to be accepted as standard practice by the first two decades of the Trecento, were patently imaginative compromises and accommodations combining current common concepts of the nature of light with observed phenomena, but with some conservative reservations retained on matters of religious sensitivity and decorous traditions. Some refinement to these procedures was made by painters, such as Simone Martini or the Lorenzetti, but the basic techniques prevailed and were assimilated into practices which shaped the paintings of the next century.

A number of celebrated painters feature in the discussions about the various transformations. However, it is perhaps not insignificant that the working out of innovations and the establishment of the new standards happens coincidentally with the major projects and the triumph of fresco painting in the S.Francesco Upper Church. The many masters and hands involved lets us consider that the emergence of the new techniques, which do appear to have had consensual acceptance, benefited from the interactive co-operation in Assisi.

Those accepted techniques and conventions set out in the early Trecento allowed forms of depiction which approximated to realistic illusion. In noting where their results might, from a 20th century point of view, be seen to fall short of success we have some insight into the thoughts and sensitivities of the period.

Some tensions between the artists' basic concepts of how light behaves and natural appearances are noticeable through the Trecento. The continuing recurrence of a general dependence on the idea, that light tones mean proximity and darker ones distance, is apparent and causes dilemmas, particularly in exterior daylight scenes,

and at times forces odd spurious shadows into existence. It may also have been an important factor in the establishment of a new stereotype for the depiction of the Virgin.

At the same time, other traditions still being observed impinged on these conventions and their execution. For example, the use of gold and silver, though partly justified when used in a self-representational way, as consistent with contemporary notions on pigment, is seen to interfere with attempts at illusion. Their continued employment then is seen to satisfy a need for decorative effect and sumptuous prestigious display. That alternative approaches were available, and considered, is seen when some artists, Duccio for one, show that attempts were made to simulate the effects of bright metal work in paint.

A further sign of restraints arising from entrenched sensitivities points to measures of appropriate decorum required of the religious art of the time. Quite obvious priorities are afforded to different personalities and subjects in the careful application of skills, and a sliding scale of reverence and protection from intrusive modelling can be discerned. The more revered central figures in devotional works, such as the Virgin and Child, have their features protected from excessively harsh directional effects or high contrast. Indeed, the Virgin is invariably given a preferred pose and treatment. More freedom is seen in the depiction of accompanying saints and attendant figures. Still further down the scale of importance, inanimate objects, garments, fabrics and furniture are subject to more aggressive modelling and it is these that often offer the major contribution to overall feelings of depth. A differential might be seen between genre, for within narrative works principal characters, now in a real world are depicted with a little more latitude, if still with care. The differentiation between them and lesser figures is still evident and yet again the still more lowly

background elements carry the task of providing any serious contextual depth. In a similar way the employment of specular reflections is selective. In devotional works Mary is given smooth clean features, with at most a broad under-stated sheen, while secondary characters can carry sharp and positive shine. Selective use again continues into narrative where dramatic highlights only appear in less important personages.

A number of light and shade innovations and seemingly successful experimental effects from this fertile period of invention do not find their way into the common practice of the Trecento painters. Giotto's essay in interior lighting for *Jesus before Caiaphas* or Pietro Lorenzetti's for his *Last Supper* are instances, as are the latter's attempts at cast shadows. But then a wholesale and abrupt changeover to a new art of clinically accurate illusion would hardly have been acceptable to the society these artists served. The reaction in the latter half of the Trecento, with a return to more decorative works, is perhaps a sign of such considerations, though obviously other factors were involved. Nonetheless, taken up immediately, or not, these inventive steps serve to emphasize the innovative atmosphere of this fertile period, whose painters creative and imaginative work provided, not just some procedural skills for the Trecento, but prepared the way for further advances in the Quattrocento. Notwithstanding the temporary hesitation of the late 1300s the real start to the revival of an art of illusion in the West comes from the hands of these artists of late Duecento and early Trecento Italy. That said, it must be repeated that the continuity of classical and antique heritage found in Byzantine art provided the background necessary for their endeavours.

Conclusion Notes

- 1: Kemp, *op.cit.*, p.9
- 2: *Ibid.*, p.335.
- 3: Hills, *op.cit.*, p.12.
- 4: Cennino (Thompson) *op.cit.*, Chapter XXVII, p.1, advises “ take pains and pleasure in constantly copying the best things which you can find done by the hand of great masters. And if you are in a place where many good masters have been, so much the better for you. But I give you this advice : take care to select the best one every time, and the one who has the greatest reputation.” The Italian is :
 “affaticati e dilèttati di ritrarre sempre le miglior cose, che trovar puoi per mano fatte di gran maestri. E se se’ in luogo dove molti buon maestri sieno stati, tanto meglio a te. Ma per consiglio io ti do : guarda di pigliare sempre il migliore, e quello che ha maggior fama ...” Cennino (Tempesti), *op. cit.*, p.43.

Appendix I

Dante's Experiment

In Dante's text Beatrice suggests:

*“Tre specchi prenderai; e i due rimovi
da te d'un modo, e l'altro, più remosso ,
tra' ambio li primi li occhi tuoi ritrovi.
Rivoltio ad essi, fa che dopo il dosso
ti stea un lume che i tre specchi accenda
e torni a te da tutti ripercosso.”*

The result is then subjectively assessed as:

*“Ben che nel quanto tanto non si stenda
la vista più lontana, li vedrai
come convien ch'igualmente risplenda.”* (Paradiso II 97-105)

To demonstrate this and test its results the following procedure was undertaken:

A video camera was set up to represent the viewer. Immediately above it, was placed a light source. In front, two mirrors were positioned at 2 metres distance, while a third, at 4 metres, was located where it could be viewed between the first two. The output of the camera was measured on an oscilloscope adjusted to display the camera's simultaneous response to the three mirrors.

Apart from the substitution of a mechanical device for a human set of eyes, one other departure from Dante's specification was made. The location of the lamp, rather



Fig. 53:
Camera,
Light
Diffuser Frame
with Mirrors at 2M.

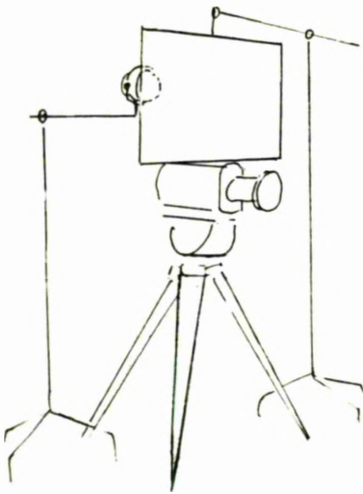
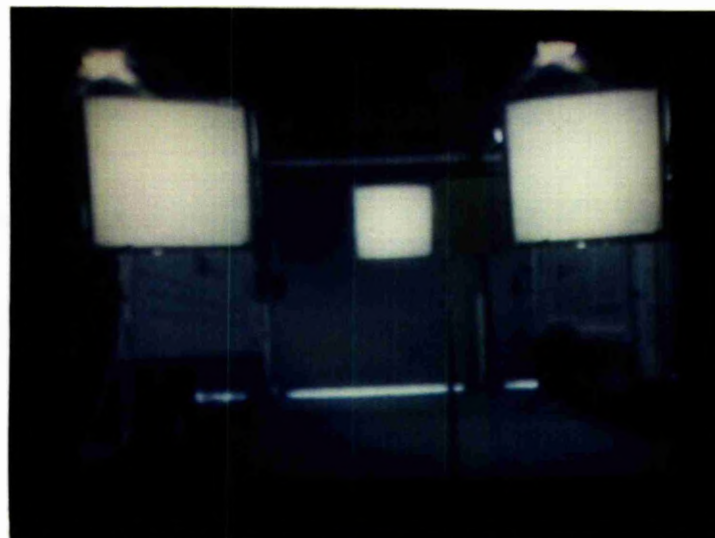


Fig. 54: Sketch Schematic
of Camera, Light and Diffuser Frame.

Fig. 55:
Off screen photograph
of camera view.



indeterminately indicated by his instruction : “*fa che dopo il dosso / ti stea un lume...*” was placed above the optical centre of the camera’s lens system to ensure that the distances, lamp to mirror and mirror to lens/eye, would be as close as possible.

The result showed, as Dante suggested, through Beatrice, that the level of brightness of the distant reflection matched that of the two nearer ones.

The experiment was carried out on Thursday 20th May 1999 at

B.B.C. Resource’s Scottish Outside Broadcast Base at Craigmount St. Glasgow.

A Sony BVP570P CCD Broadcast Camera was used.

This was tripod mounted with its lens at a height of 1400mm.

An 800 watt Redhead lamp, with a 600x600 mm. frame carrying diffusion material placed in front of it, effectively provided a rectangular soft source 550x550mm (the frame surrounds were 25mm broad) The frame, i.e. the effective source, was set, tight to the upper surface of the camera, and centrally over the optical centre of the lens/camera system. [Fig.53 & 54]

Two clear glass mirrors, 300 mm square,² were set up at a distance of 2.0M in front of the camera, Point A. A gap, centred on the axis of the lens, was left between them. A third, identical, mirror was located at a further 2.0M distance, Point B. It was positioned on the axis of the lens so that it appeared, from the camera, to lie between the first two mirrors. The gap between the first two mirrors was adjusted to be the minimum necessary to allow mirror three to be viewed from the camera position, but without the first pair interfering with the third’s reflection of the full surface of the light.³

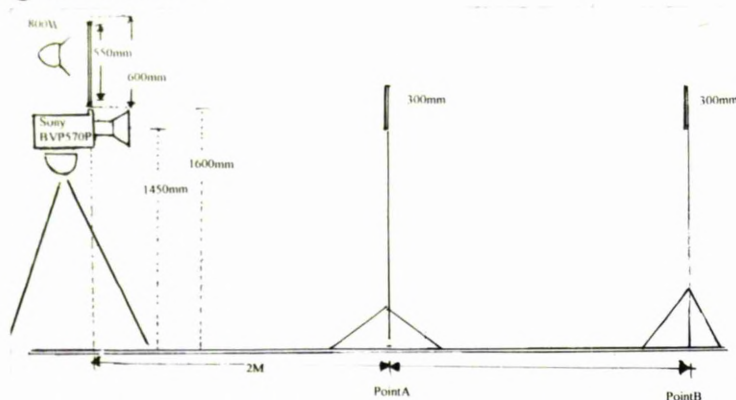


Fig. 56: Sketch layout Camera Light and Mirrors.



Fig. 57: Photograph Layout Camera Light and Mirrors.

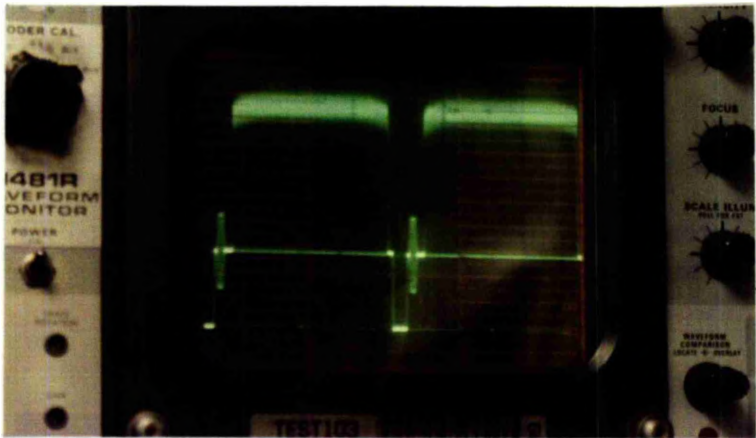
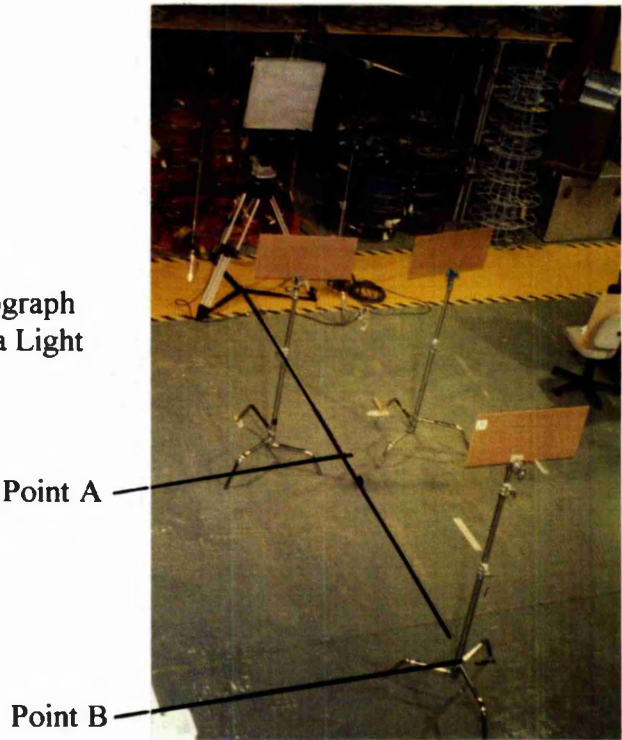


Fig. 58: Oscilloscope Trace, Response to Plain white Board.

The camera zoom lens angle was adjusted to bring the two nearer reflected light images well within the main field of the image in order to avoid any possible peripheral distortions, either in the lens or within the CCD pickup devices. The image presented was as indicated in [Fig.55 facing p.437].

All three mirrors were adjusted in height and angle to reflect the image of the illuminated diffusion frame directly and squarely towards the camera. The choice of 600mm frame with 25mm surround allowed the image of the 550mm working area of soft light to almost fill the mirrors, but with the 25mm borders allowing some certainty of positioning, ensuring both rectangular alignment and no unwanted cropping.

The final arrangements are shown in [Fig.56 & 57]

Camera data and precautionary adjustments:

The BVP570P camera was working to standard broadcast parameters providing for a peak white output at 1volt p-p, 70:30 picture-sync ratio, and 4:3 aspect ratio.

This output was displayed on an oscilloscope, set to display variations in the levels of response during the line period, ie. across the picture.

Limiters were adjusted to ensure no compression at peak white.

Gamma correction was switched out to provide a linear transfer response.

Black , no-light, shading was checked by capping the lens, and found to be flat.

White shading was checked by viewing a plain painted board with iris adjusted to provide 90% output [Fig.58]. Here some slight reduction in output appeared at extreme ends of lines. This is normal at outer edges of any lens' field. The central working area was level. As noted already, the camera lens zoom angle was adjusted to bring the test images of the mirrors within the area of flat response.

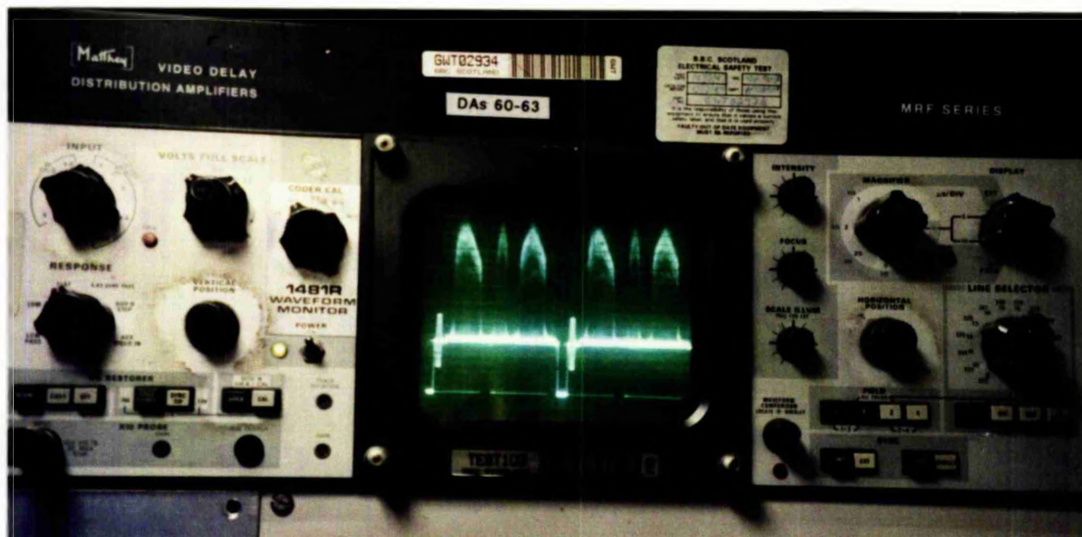


Fig. 59: Oscilloscope Trace corresponding to camera output, 2 lines displayed.

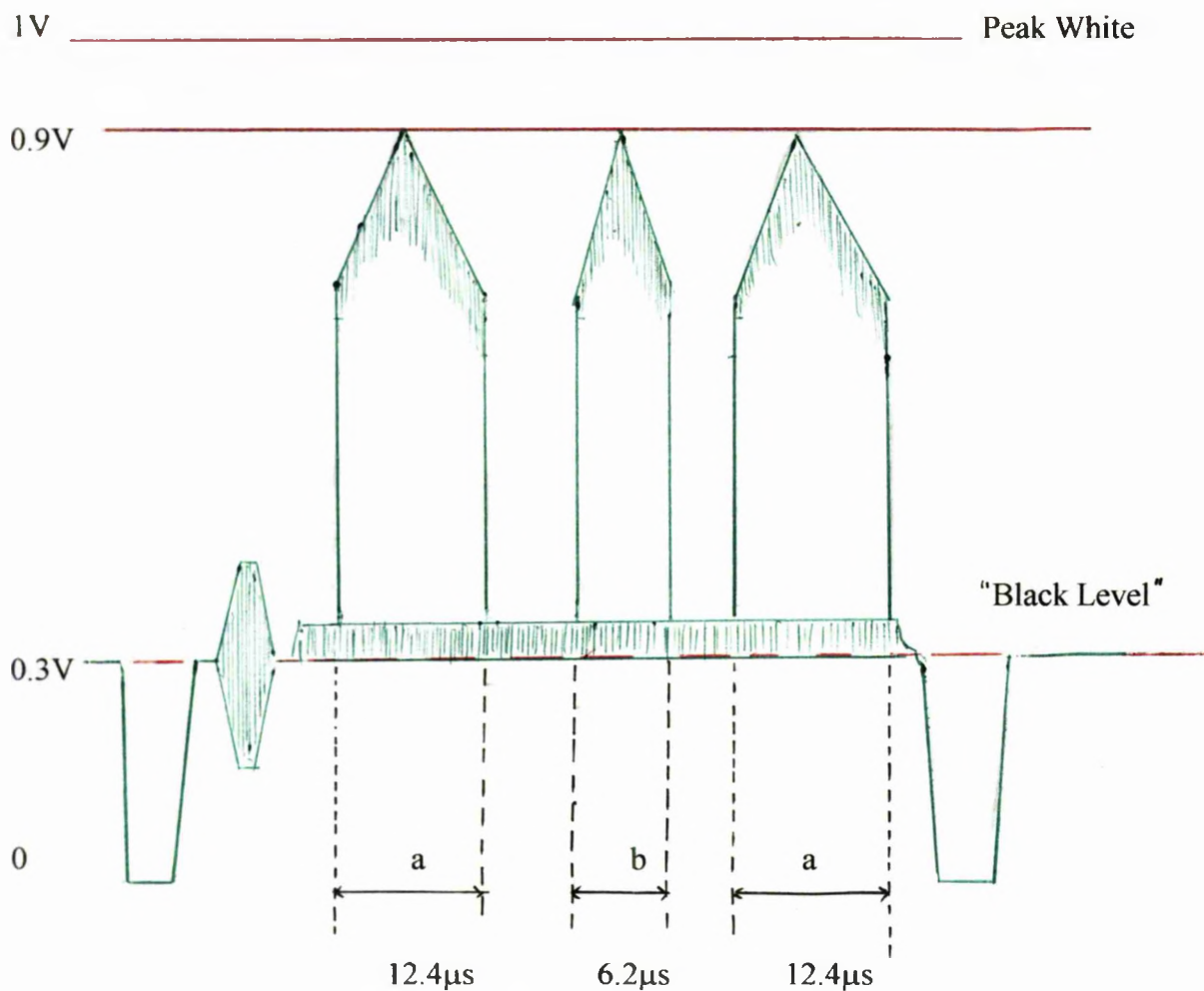


Fig. 60: Sketch of Oscilloscope Trace with measurements.

All additional lighting was switched off and the only illumination was that provided by the 800w lamp. Black level was adjusted to be just visible on the oscilloscope to ensure black shading was seen to remain flat throughout tests.

The iris control was set to bring the peak signal levels of the three reflected images to approx.90%, to be clear of any possible clipping at 1volt.

Results

The resulting oscilloscope trace measuring the simultaneous responses of the three mirrors is shown in [Fig.59 & 60].

Though the middle response was, as to be expected being at twice the distance, half the width of the outer two, $6.2\mu\text{s}$ as against $12.4\mu\text{s}$, all three areas of reflection had near identical responses in terms of peak light levels, showing maximums at 0.9v.

Light levels were measured at Points A, 2M, and B, 4M, and also at 6M and 8M from the light source. The meter was a Minolta Chroma Meter.

Point A indicated 170 lux, Point B registered 45 lux, 6M 20 lux and at 8M 12 lux.

This progression approximates to the inverse square law,⁴

$$170 \times (2/4)^2 = 42.5 \quad 170 \times (2/6)^2 = 18.9 \quad 170 \times (2/8)^2 = 10.6$$

Conclusion

The camera output, as displayed on the oscilloscope, objectively confirmed Dante's subjective assessment, that the perceived brightness of an object viewed at varying distances is independent of that distance. At the same time the metered light readings confirmed the progressive reduction in illumination with distance, which closely followed an expected inverse square law.

A number of refinements could of course be made to offer a more clinically rigorous experiment with improved precision of the assessment of levels of response for each mirror, a more detailed checking of the camera optics and electronics, more precise alignment of mirrors with the camera and light axis, more meticulous measurement of light, distances and the signal voltages, or a range of variations of distances and light levels. But, even without such sophistication, the difference between the constancy of perceived brightness of increasingly distant objects and progressively decreasing illumination, assessed as light per unit area, is adequately demonstrated in this simple experiment, which stays close to Dante's prescription. The nature of the two types of response differentials indicates their being of totally different orders. The first, with mirrors, indicates no perceptible reduction while the second does clearly demonstrate a sharply progressive diminution of light levels with distance and one obviously following an anticipated square law reduction.

One factor not allowed for, and perhaps worth noting, is that the mirrors of Dante's time were undoubtedly less efficient and no doubt were also variable in quality, but this clearly would have been allowed for in any critical discussion by Dante and his contemporaries.⁵

Appendix I Notes

- 1: "Take three mirrors and put two of them at an equal distance from thee, and let the other, farther off, meet thy eyes between the first two; then, turned to them have
 ✧ alight set behind thy back which kindles the three mirrors and returns to thee struck back by them all. Although the light seen farthest off is not of the same size thou wilt see then that it must shine with equal brightness." Dante Alighieri *The Divine Comedy*, trans. J.D. Sinclair, New York, 1961, 3 Vol.
Paradiso Canto II lines 97-105.
- 2: The mirrors were normal, commercially available, Pilkington clear glass 300mm square mirror tiles. The quality was to normal manufacturing specification.
 Para. 5.1.1.1 of DIN 1238, which requires "Mirrors made of uncoloured glass shall have a directional reflection level ... of at least 85% ..." (information courtesy of Mr T. Mason, Quality Assurance Manager, Pilkington United Kingdom Limited)
 Also in order to be sure of any possible discrepancies the three mirrors were rotated through the three different positions, and no discernible differences resulted.
- 3: In theory a minimum gap of 450mm is needed at the mid point between a 300mm mirror and a 660mm light source.
- 4: Diffuse Sources. The distribution of light from a diffuse source does not strictly conform to the inverse square law as is found for point sources. The addition, then, of diffusion material in front of the lamp might be seen to modify matters in this respect. However, in practice it is found that "soft sources follow an inverse law, up to distances comparable with the size of the source, and then follow the inverse square law for distances thereafter." (A. Bermingham *Television Lighting*, *Journal of Society of Television Lighting Directors*, 64, p.42) In this case the distances involved are considerably greater than our extended light source dimensions. The distance to Point A, 2M, is greater than the 550mm width of the light source by a factor of 3.6 and to Point B, 4M, by over 7.
- 5: As regards the early qualities of glass mirrors, the metal used was not silver but lead. *Paradiso*, Canto II, 89-90, tells of glass that conceals lead behind it, the Italian being "...vetro / lo qual di retro a sè piombo nasconde." Lindberg, *op.cit.*, (*Perspectiva Communis*), p.165, Part II prop.7, confirms this in noting that common glass mirrors were coated with lead : "specula consueta vitrea sunt plumbo subducta."

Appendix II

1: Lighting Analysis of Trecento Madonnas in D.C.Shorr's

"Christ Child in Devotional Images in Italy during the XIV Century.

| Type as D.C.Shorr | Trecento Examples | Standard | Alternate | Uncertain | Frontal | Comment |
|----------------------|----------------------|-----------------|------------------|-------------------|----------------|--------------------|
| Frontispiece | 1 | 1 | 0 | 0 | 0 | |
| 1 | 6 | 5 | 1 | 0 | 0 | |
| 2 | 4 | 3 | 1* | 0 | 0 | 1xGiotto |
| 3 | 12 | 8 | 2* | 2 | 0 | 1xGiotto |
| 4 | 9 | 5 | 1 | 1 | 2 | |
| 5 | 15 | 11 | 0 | 1 | 2 | 1xProfile |
| 6 | 15 | 12 | 0 | 1 | 2 | |
| 7 | 4 | 4 | 0 | 0 | 0 | |
| 8 | 11 | 8 | 1 | 2 | 0 | |
| 9 | 13 | 10 | 1 | 2 | 0 | |
| 10 | 34 | 26 | 0 | 6 | 2 | |
| 11 | 4 | 4 | 0 | 0 | 0 | |
| 12 | 23 | 18 | 1 | 1 | 3 | |
| 13 | 18 | 14 | 0 | 2 | 2 | |
| 14 | 9 | 6 | 0 | 2 | 1 | |
| 15 | 3 | 1 | 0 | 0 | 2 | |
| 16 | 6 | 5 | 0 | 1 | 0 | |
| 17 | 15 | 12 | 1 | 2 | 0 | |
| 18 | 29 | 26 | 0 | 3 | 0 | |
| 19 | 12 | 9 | 2 | 1 | 0 | |
| 20 | 12 | 10 | 0 | 2 | 0 | |
| 21 | 11 | 10 | 1 | 0 | 0 | |
| 22 | 8 | 7 | 0 | 0 | 1 | |
| 23 | 18 | 16 | 1 | 1 | 0 | |
| 24 | 12 | 11 | 0 | 1 | 0 | |
| 25 | 4 | 2 | 0 | 2 | 0 | |
| 26 | 4 | 3 | 0 | 0 | 1 | |
| 27 | 5 | 5 | 0 | 0 | 0 | |
| 28 | 9 | 6 | 1 | 2 | 0 | |
| 29 | 18 | 14 | 1 | 2 | 1 | |
| 30 | 6 | 6 | 0 | 0 | 0 | |
| 31 | 8 | 8 | 0 | 0 | 0 | |
| 32 | 2 | 2 | 0 | 0 | 0 | |
| 33 | 2 | 2 | 0 | 0 | 0 | |
| 34 | 2 | 0 | 2 | 0 | 0 | |
| Totals | 364 | 290 | 17 | 37 | 19 | +1x Profile |
| | | Standard | Alternate | Indistinct | Frontal | |
| Percent. | 100 | 80 | 4.5 | 10 | 5 | |

Standard: Head inclined, lit from exposed cheek side.

Alternate: Lit from direction to which Mary turns.

Uncertain: Illustration makes it difficult to determine shading.

Frontal : Mary looks to front, lighting from frontal position.

2: Direction of the Virgin's Pose in the D.C.Shorr examples.

Includes in this comparison earlier Pre-Trecento works

Includes some parts of strictly narrative works, e.g 2 versions of *Adoration of the Magi*. pp 31 & 36

Omits 4 antique pagan examples, all sculptural, but each has the mother turned to her left.

Omits *Presentation in Temple*, Mary not holding Child pp. 90 98 187

| Totals | V to Her L | V to Her R | Frontal | Sculp to L | Sculp to R |
|--------------|--------------|-------------|----------|------------|------------|
| Pictures 411 | 309 > 75% | 81 < 20% | 21 5% | | |
| Sculpture 10 | | | | 8 > | 2 < |
| Total 421 | 317 > 75% | 83 < 20% | 21 5% | | |

3: Relationship of Virgin and Child .

Child is held on the side to which the Virgin turns in 393 cases

Exceptions to this 28 instances are :-

Virgin turned to her Left, with Child held on her Right arm

1 instance : p.37

Virgin turned to her Right, with Child held on her Left arm

12 instances : pp.29, 36 (3), 37(2), 82, 100, 105, 175, 179, 190.

Virgin in a Frontal pose with Child held on Left arm

13 instances : pp. 29,36,37(2), 47, 48, 82, 94(2), 100, 104, 115, 167.

Virgin in a Frontal pose with Child held Centrally

1 instance : p.33.

Virgin in a Frontal pose with Child on Right arm

1 instance : p 86.

Sculpture, Virgin turned to Right with Child on her left arm

1 instance : p.86.

GLOSSARY

- absolute colour** : Medieval use of colour. Self sufficient colour is retained strictly within the outlines of form. The chosen colour for each item is modified by neutral additions for modelling, and no cross colour from reflection or shadowing disturbs this.
- ambient light** : The general lighting in a particular location which results from the aggregation of all the accidental reflections of light from all the surfaces there. In most cases this is largely non-directional.
- brightness or luminance** : The level of light reflected from a lit surface in a given direction, assessed in lumens per square metre.
- cangiante** : The use of contrasting colours as well as tonal gradations in modelling. The name *cangiante*, literally “changing”, derives from shot silk fabrics which change their apparent colour dependent on the angle of light or viewpoint.
- chrysography** : Literally writing in gold in manuscript work, in painting it describes the use of gold striations as decorative linear highlights.
- colour constancy** : The ability of the visual system to see an object as having the same colour in widely differing lighting circumstances, for example in lamp light, sunny daylight or overcast daylight. But it must be noted the accommodations the system makes are only approximate, as demonstrated by the difficulty of accurately matching of colours in such variable conditions. A better term would be “effective colour constancy”.
- contrast** : Degree of difference between the lightest and darkest parts of a picture.
- diffuse radiation** : The emission of light indiscriminately in all directions from a large source, for example an overcast sky.
- diffuse reflection**: The re-radiation of light incident on a broad surface indiscriminately in all directions.
- Eleousa** : See **Glykophilousa**
- extramission** : The theory that sight was a matter of active perception with visual rays emanating from the eye, see **intromission**
- film colour** : The perception of colour where there is no perceptible limiting edge or texture, as in the view of a sky through a window. The colour plane is not seen to have any particular location in space, but to be at an indeterminate distance. It appears as self luminous rather than illuminated. See also **surface colour**.
- Galaktotrophousa** : Form of Icon of the Virgin and Child, with Mary Suckling the Infant. Byzantine model for the Italian *Virgo Lactans*
- Glykophilousa** : Form of Icon of Virgin and Child with Mary and Infant in close tender embrace. Also termed *Eleousa* “Loving-kindness”. Byzantine model for the Italian “Virgin of Tenderness”.
- Hodegetria** : Revered icon of the Virgin has the Christ Child seated erect on her left arm, while she draws attention to him with her right hand. The name, Hodegetria, derives possibly from the monastery of Hodegon in Constantinople, where a treasured version of this icon was kept. There is, though, also the possibility that the name of the monastery was taken from that of the icon itself, for this can be interpreted as “she who shows the way”. The icon was traditionally attributed to St Luke. One variant of this the *dexiokratousa* has the Infant on Mary’s right arm, but the more frequent form, following the stereotype’s left arm setting is termed *aristerokratousa*.

hue : Colour. The gradation or attribute of colours which permits them to be classed as red, yellow, green, blue, or an intermediate between these.

Iconoclasm, Iconoclastic Controversy : The declaration by Emperor Leo III in 726 ordered the destruction of all images and icons as idols. Resistance to this resulted in bitter conflict in the Eastern Church. Subsequently in 787 icons were again recognised, with the degree of veneration to be paid them specified. Renewed antagonism to such veneration, however, led to Leo V ordering the removal of icons again in 814. This “Second Iconoclastic Controversy” continued until 843 when icons were finally recognised and restored to Churches.

illuminance, or illumination : The light energy falling on a particular spot. Measured as the luminous flux per unit area on an intercepting surface at that point, the international unit *lux* is 1 lumen per square metre

intromission : The theory of visual perception which understands that the eye is passive and receives stimuli as rays from the viewed object, see **extramission**

isochromatism : A compositional arrangement, using **absolute colour** (q.v.), where objects and areas of similar colour and tone are deployed across a painting with a view to offering balance or symmetry of overall effect.

Lambertian reflector: A diffuse reflector with light radiating consistently in all directions such that the light follows the cosine of the angle between the normal to the surface and the viewer’s position. The apparent brightness remains the same as area viewed varies exactly in the same ratio. A matt white board is an example. Named after 18th-century physicist Johann Heinrich Lambert.

luminance : See **brightness**.

lux primaria : Medieval understanding of the direct transmission of light in a straight line.

lux secundaria : Medieval understanding of indirect or accidental transmission of light. Seen as resulting from the lateral spread of light from the rays of **lux primaria** (q.v.), as this radiates rectilinearly.

mesopic : The eye’s response in a lower intermediate range of light conditions where both rods and cones of the retina are involved.

Nikopeia : Image of the Virgin and Child, in frontal hieratic pose. The Infant is held directly in front of Mary, and both look straight out at the viewer. The name derives from a stereotype in Constantinople which was believed to have been effective in ensuring victory (*Nike*) on its procession around the city walls, during a time of siege.

orans, orant : Latin “praying”. Representation of Saint or Virgin with hands held up and with palms forward in traditional Greek and Roman praying manner.

Pantocrator : Image of Christ or God as ruler of all, literally “all sovereign”. Generally a frontal, bust size, image, though occasionally full length, with the right hand blessing and the left carrying an open book.

penumbra : The area of reducing shadow between full shadow, **umbra** (q.v.), where there is the complete obstruction of light, and areas where there is no obstruction of light.

photopic : The eye’s response in normal bright conditions, with light-adapted eyes. Involves the cones of the retina. This response is maximum in the green/yellow central area of the spectrum and progressively reduces as the light extends to both the red and the blue ends of the spectrum. Hence the perception that reds and blues are darker colours than greens and yellows.

Purkinje Shift or Effect : A change in the eye's response in decreasing light. The broad photopic response to colours across the spectrum in normal bright light, gives way progressively to scotopic vision where the blue sensitive rods become more important. The result is that red objects appear progressively darker while blue ones appear relatively brighter.

reflection : The re-radiation of light from a surface which it strikes. It can be diffuse or **specular** (q.v.).

refraction : The deflection from a straight path undergone by a light in passing obliquely from one medium (as air) into another (as water) in which its velocity is different. The perception of the straight stick as being bent, when partly in and partly out of water, is a common illustration.

saturation : Chromatic purity. This is the extent to which a colour is free of dilution with neutral white or black. Commonly the intensity of a colour.

scotopic : The eye's response in low light level conditions (night vision) with dark-adapted eyes. Involves only the retinal rods as light receptors. Response is only in the blue area of the spectrum and effectively monochromatic with no colour variations readily discernible.

shading, tilt shading : The variations in light reflected from the differently angled surfaces of an object as these accept more or less light dependent on their planes' angular presentation to incident light.

Shadows :

attached shadow : Shadow cast by part of an irregular shaped object on itself or on an area with which it is contiguous, as of the nose on the cheek or of the chin on the neck.

cast shadow : Shadow of one object appearing on another separate object or surface.

projected shadow : as **cast shadow**.

self shadow : The shadow on the opposite side of an object from a light which results from obstruction by the object itself.

hard shadow : Shadow produced by a point or spot source which has sharply defined hard edges.

Sources :

hard source : A small area source of light which produces hard edges to shadows.

point source : A small area source of light.

spot source : As **point source**.

soft source : A large area source of light which produces soft edges in shadows.

broad source : As **soft source**.

extended source : As **soft source**.

surface colour : The perception of colour where a coloured area has defined edges and signs of texture. The colour is then seen to be integral with the object and a quality of that object's surface. It can thus be seen as positively located in space along with the object. See also **film colour**

specular reflection : The sharp mirror-like reflections from polished surfaces.

tonal modelling : The representation of the gradual variations in brightness resulting from **shading** (q.v.).

umbra : The area of full shadow where light is completely obstructed.

- value, tonal value** : Relative brightness or darkness of an object or surface. Also used in connection with a particular colour's effectiveness in the **photopic response** (q.v.), where, for example, red is apparently less bright than green or yellow.
- visual acuity** : Sharpness of vision. The angle subtended at the eye by the angular spacing between two lines at the point where they are *just resolvable* is an assessment of the resolving power of the eye. The reciprocal of this angle, in minutes of arc, is the standard measure of visual acuity. A visual acuity of unity indicates a power for resolving detail subtending one minute of arc at the eye.
- work lines** : The arrangement of tesserae in mosaic into linear arrays to follow the contours or modelling of an object depicted. Similar to the conscious use of brush strokes in painting.

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CHASING SHADOWS :

A LOOK AT THE TREATMENT OF LIGHT AND SHADE IN PAINTERS'

QUEST FOR SPATIAL REALISM IN 13TH AND 14TH CENTURY ITALY

VOLUME TWO OF THREE

PLATES 1-212

by

JOHN BLACK

THESIS SUBMITTED FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF GLASGOW

DEPARTMENT OF HISTORY OF ART

September 2001

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- 169: Torriti, *Dormition*, mosaic, c. 1296, Rome, Sta.Maria Maggiore.
- 170: Torriti, *Prophet*, fresco, c.1296, Rome, Sta.Maria Maggiore.
- 171: *Joseph and the Wife of Potiphar*, 17th century watercolour copy of fresco by Cavallini, S.Paolo fuori le Mura, bet. 1282-1290, Cod. Barb. Lat. 4406 fol.46. Rome, Vatican Library.
- 172: Cavallini, *Madonna and Child*, detail of *Votive Mosaic*, mosaic, c.1290s Rome, Sta.Maria in Trastevere.
- 173: Cavallini, *The Annunciation*, mosaic, c.1290s, Rome, Sta.Maria in Trastevere.
- 174: Cavallini, *Nativity*, mosaic, c.1290s, Rome, Sta.Maria in Trastevere.
- 175: Cavallini, *Adoration of the Magi*, mosaic, c.1290s, Rome, Sta.Maria in Trastevere.

- 176: Cavallini, *Corbel*, detail of *The Adoration of the Magi*, mosaic, c.1290s, Rome, Sta.Maria in Trastevere.
- 177: Cavallini, *Presentation in the Temple*, mosaic. c.1290s Rome, Sta.Maria in Trastevere.
- 178: 17th century watercolour copy of Pl.177, Cod. Barb. Lat. 4404, fol.21.r. Rome, Vatican Library.
- 179: Cavallini, *St.Simeon*, detail of *Presentation in the Temple*, mosaic, c.1290s Rome, Sta.Maria in Trastevere.
- 180: Cavallini, *Enthroned Christ*, detail of *Last Judgement*, fresco, 1290s, Rome, Sta.Cecilia-in Trastevere.
- 181: Cavallini, *Christ*, detail of *Last Judgement*, fresco, 1290s, Rome, Sta.Cecilia in Trastevere.
- 182: Cavallini, *Apostles*, detail of *Last Judgement*, fresco, 1290s, Rome, Sta.Cecilia in Trastevere.
- 183: Cavallini, *St.Bartholomew*, detail of *Last Judgement*, fresco, 1290s, Rome, Sta.Cecilia in Trastevere.
- 184: Cavallini, *Virgin and Child, with SS. John and Francis and Cardinal D'Acquasparta*, fresco, c.1302, Rome, Sta.Maria in Aracoeli.
- 185: Master of the Arrest, *The Arrest of Christ*, fresco, c.1291, Assisi, S.Francesco, Upper Church Nave.
- 186: Master of the Arrest, *Nativity*, fresco, c.1291, Assisi, S.Francesco, Upper Church Nave.
- 187: Isaac Master, *Isaac*, detail of *Esau before Isaac*, fresco, c.1295-1298, Assisi, S.Francesco, Upper Church.
- 188: Isaac Master, *Esau before Isaac*, fresco, c.1295-1298, Assisi, S.Francesco, Upper Church.
- 189: Isaac Master, *Isaac blessing Jacob*, fresco, c.1295-1298, Assisi, S.Francesco, Upper Church.
- 190: Isaac Master, *Pentecost*, fresco, c. 1295-1298, Assisi, S.Francesco, Upper Church.
- 191: Master of the St.Francis Cycle, *St.Francis giving away his Cloak*, fresco, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 192: Master of the St.Francis Cycle, *St.Francis before the Crucifix*, fresco, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 193: Master of the Life of St.Francis Cycle, *Corbels*, detail of *St.Francis before the Crucifix*, fresco, c.1298-1305, Assisi, S.Francesco Upper Church.
- 194: *Fictive Corbel Decoration*, detail, fresco, c.late 1290s-early 1300s, Assisi, S.Francesco, Upper Church.
- 195: Master of the St.Francis Cycle, *St.Francis Renounces his Heritage*, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 196: Master of the St.Francis Cycle, detail, *St.Francis Renounces his Heritage*, fresco, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 197: Master of the St.Francis Cycle, *The Confirmation of the Rule*, fresco, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 198: Master of the St.Francis Cycle, detail of, *The Confirmation of the Rule*, fresco, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 199: Master of the St.Francis Cycle, *Expulsion of the Devils from Arezzo*, fresco, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 200: Master of the St.Francis Cycle, detail of *Expulsion of the Devils from Arezzo*, fresco, c.1298-1305, Assisi, S.Francesco, Upper Church.

- 201: Master of the St.Francis Cycle, *Ordeal of Fire Before the Sultan*, fresco, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 202: Master of the St.Francis Cycle, detail of *Ordeal by Fire*, fresco, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 203: Master of the St.Francis Cycle, detail of *The Ecstasy of St.Francis*, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 204: Master of the St.Francis Cycle, *The Crib at Greccio*, fresco, c.1298-1305, Assisi, S.Francesco Upper Church.
- 205: Master of the St.Francis Cycle, detail of *St.Francis Preaching before Honourous III*, fresco, c.1298-1305, Assisi, S.Francesco Upper Church.
- 206: Master of the Obsequies of St.Francis, *St.Francis' Appearance at Arles*, fresco, c.1298-1305, Assisi, S.Francesco Upper Church.
- 207: Master of the Obsequies of St.Francis, *The Stigmatisation of St.Francis*, fresco, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 208: Master of the Obsequies of St.Francis, *St.Francis*, detail of *The Stigmatisation of St.Francis*, fresco, c.1298-1305, Assisi S.Francesco Upper Church.
- 209: Master of the Obsequies of St.Francis, *Plant*, detail of *The Stigmatisation of St.Francis*, fresco, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 210: Master of the Obsequies of St.Francis detail of *The Verification of The Stigmata*, fresco, c.1298-1305, Assisi, S.Francesco, Upper Church.
- 211: Master of the Obsequies of St.Francis, detail from *St.Clare Grieving over the Body of St.Francis at S.Damiano*, fresco, c.1298-1305, Assisi, S.Francesco Upper Church.
- 212: S.Cecilia Master, detail from *The Liberation of Peter the Heretic*, fresco, c.1300, Assisi, S.Francesco, Upper Church.

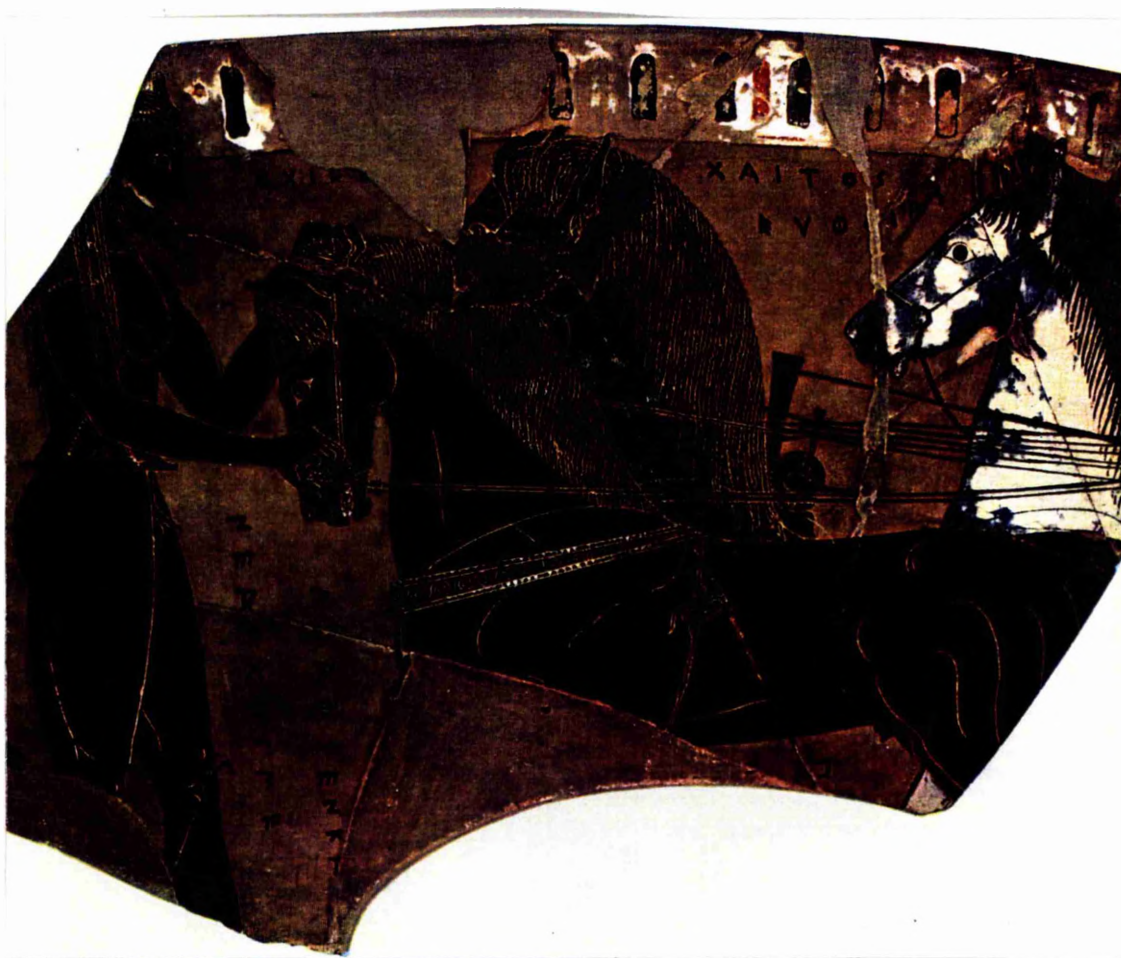


Plate 1 : Nearchos, *Achilles Preparing for Battle*,
fragment of Athenian Kantharos,
2nd quarter of 6th century B.C.,
Athens, National Archaeological Museum.



Plate 2: Euthymides, *Reveller*, detail of Athenian Jar, late 6th century B.C.
Munich, Staatliche Antikensammlungen.

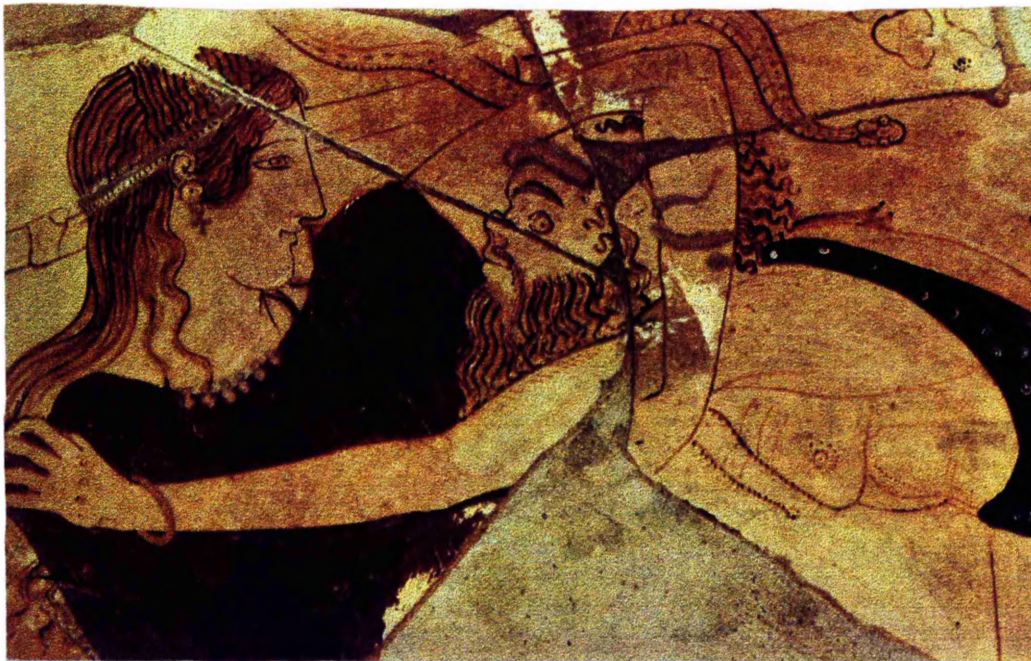


Plate 3: Pistoxenos Painter, *Satyr and Maenad*, fragment of Athenian Cup, mid 5th century B.C., Taranto, Museo Nazionale.



Plate 4: Pistoxenos Painter, *Aphrodite on a Goose*, Athenian Cup, c.470 B.C.
London, British Museum.



Plate 5: Niobid Painter, *Niobid Vase*, Athenian Calyx Krater, c. 460 B.C., Paris, Louvre.

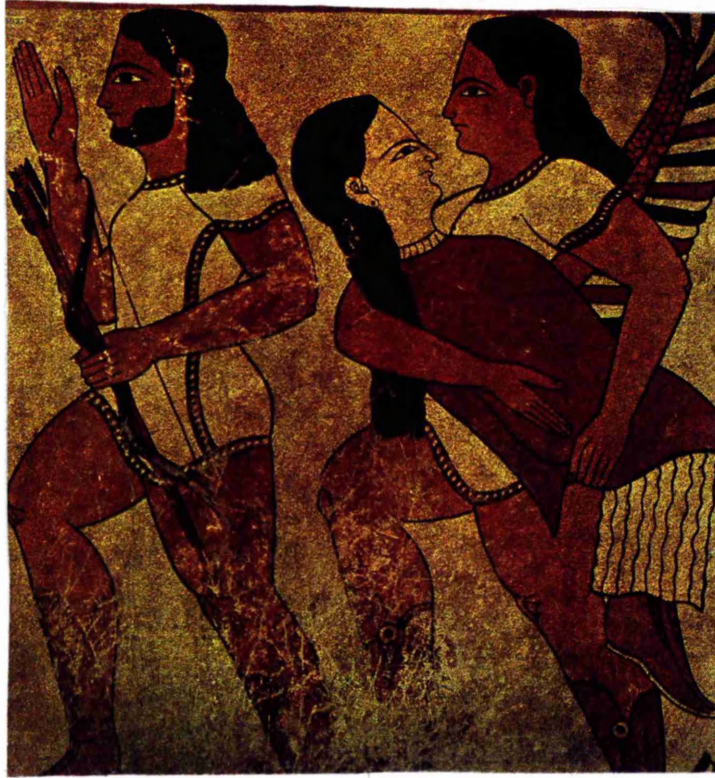


Plate 6: *Woman (Iphigenia ?) carried off by a Winged Being*,
painted terracotta slab, 3rd quarter 6th century B.C.
from Compana Tomb Caere, Paris, Louvre.



Plate 7 : *Symposium*, detail of fresco, c.480-470 B.C.
from *The Tomb of the Diver*,
Paestum, National Archaeological Museum.



Plate 8: *Nike in a Chariot*, fresco, c.400 B.C.
Paestum, National Archaeological Museum.



Plate 9: *Warrior Tomb*, detail of fresco, 4th century B.C., from Nola, Campania.
Naples, National Archaeological Museum.



Plate 10: *Warrior detail of Amazonomachy*, painted alabaster sarcophagus, 4th century, Florence, Archaeological Museum.

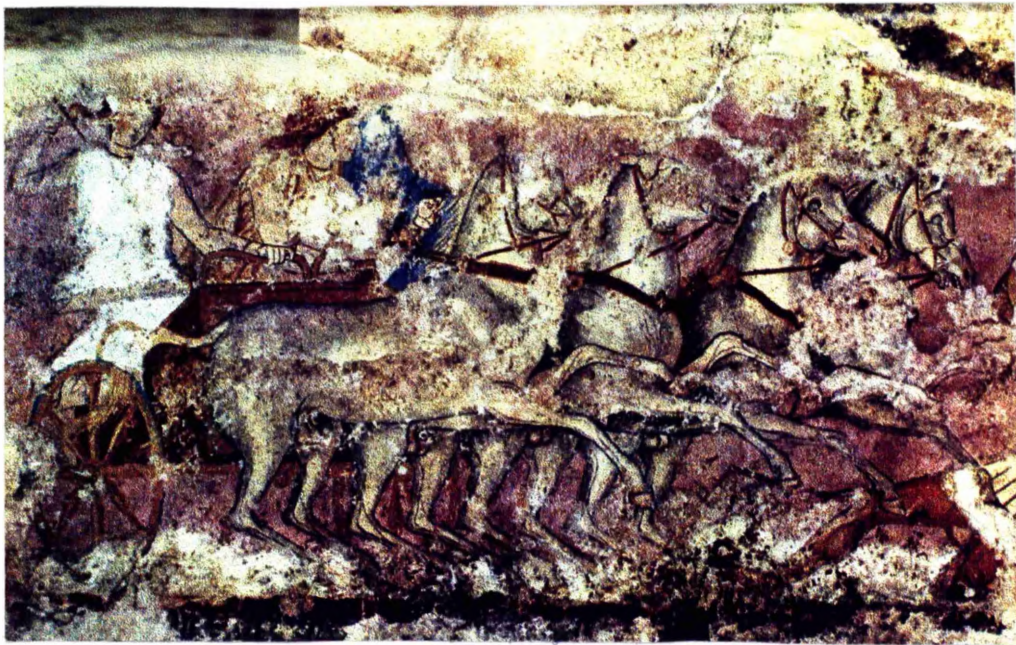


Plate 11: *Quadriga, detail of Amazonomachy*, painted alabaster sarcophagus, 4th century, Florence, Archaeological Museum.



Plate 12: *Lion Hunt*, wall painting, c.336 B.C., Vergina, Facade Philip II Tomb.

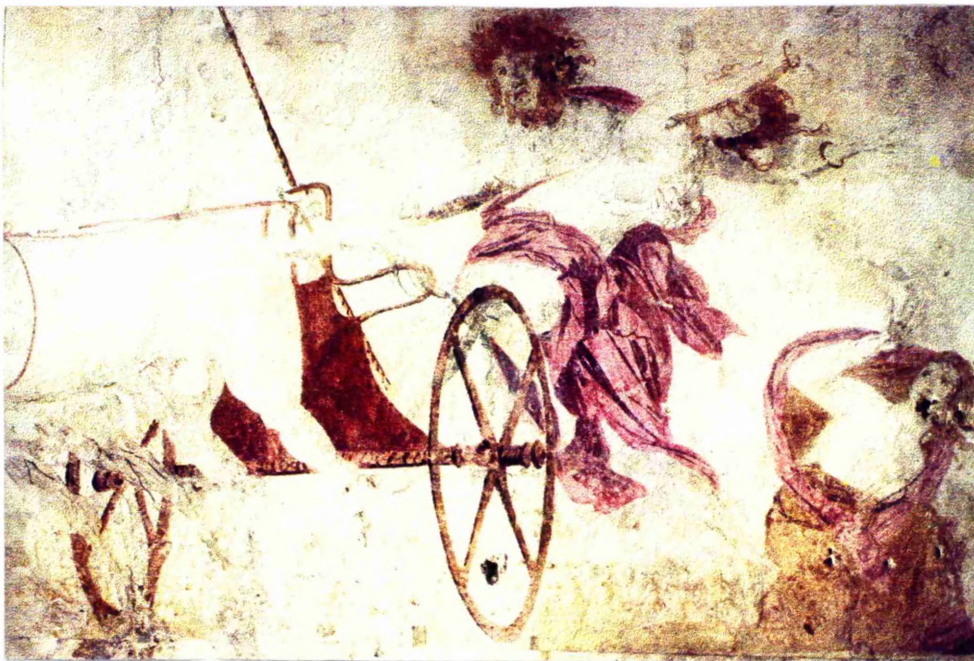


Plate 13: *Pluto, Persephone and an Oceanid, Rape of Persephone*, wall painting, c.335 B.C. Vergina, Philip II Tomb.



Plate 14: *Pluto*, detail of *Rape of Persephone*, wall painting, c.336 B.C.
Vergina, Philip II Tomb.



Plate 15: *Persephone*, detail *Rape of Persephone*, wall painting, c.336 B.C.
Vergina, Philip II Tomb.



Plate 16: *Lion Hunt*, detail, wall painting, c.336 B.C.,
Vergina. Facade Philip II Tomb.



Plate 17:
Horse and Rider,
detail of *Lion Hunt*,
wall painting, c.336 B.C.,
Vergina,
Facade Philip II Tomb.



Plate 18: *Warrior*, wall painting, c.290 B.C., Vergina, Bella Tumulus.



Plate 19: *Deer Hunt*, pebble mosaic, c.300 B.C., Pella Museum.



Plate 20: *Perseus and Andromeda*, after Nikias, fresco, 3rd quarter of 1st century A.D.,
(Pompeii VI. 9.6 House of the Dioscuri),
Naples, National Archaeological Museum.



Plate 21: *Hercules and Telephus*, fresco, 1st Century A.D.,
from the Basilica of Herculaneum,
Naples, National Archaeological Museum.



Plate 22: *Alexander Mosaic*, mosaic, 1st century A.D.
copy of 4th century B.C. painting,
Naples, National Archaeological Museum.



Plate 23: *Darius*, detail of *Alexander Mosaic*, mosaic, 1st century A.D.
copy of 4th century B.C. painting,
Naples, National Archaeological Museum.

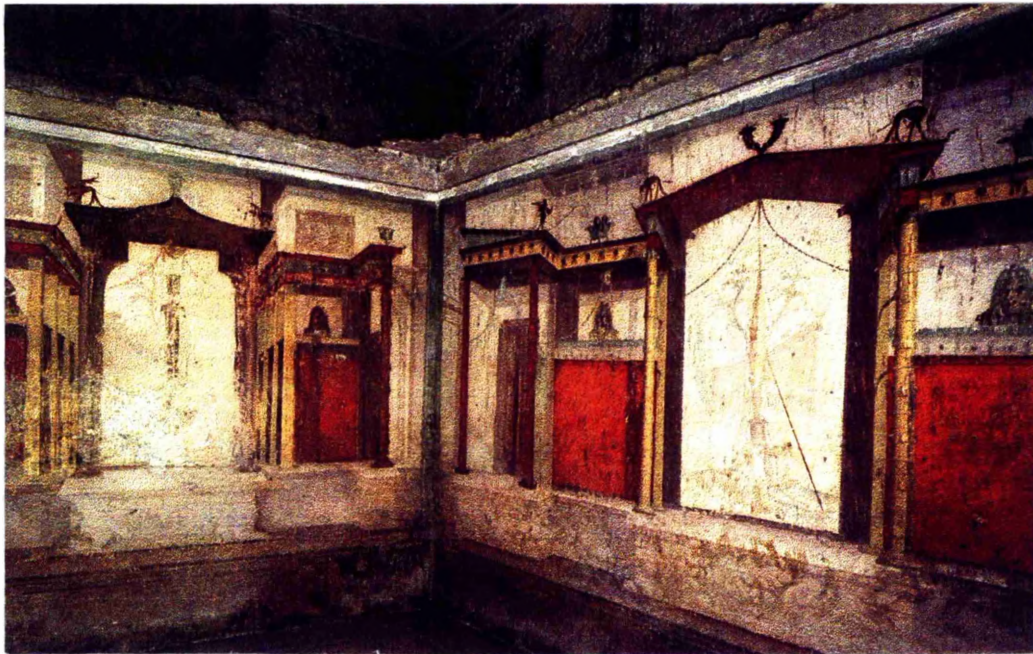


Plate 24: *The Room of the Masks*, fresco, c.30 B.C.,
Rome, Palatine, House of Augustus.

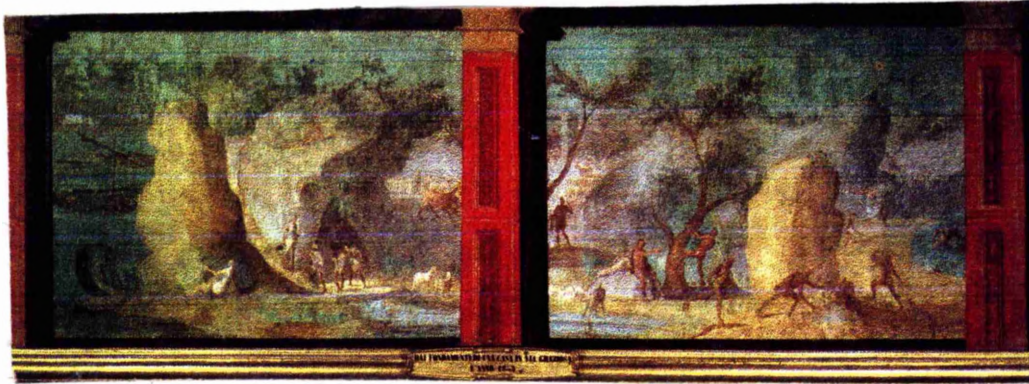


Plate 25: *Travels of Odysseus*, fresco (transferred to canvas), c.50-40 B.C.
from Villa on Esquiline, Rome, Vatican Museum.

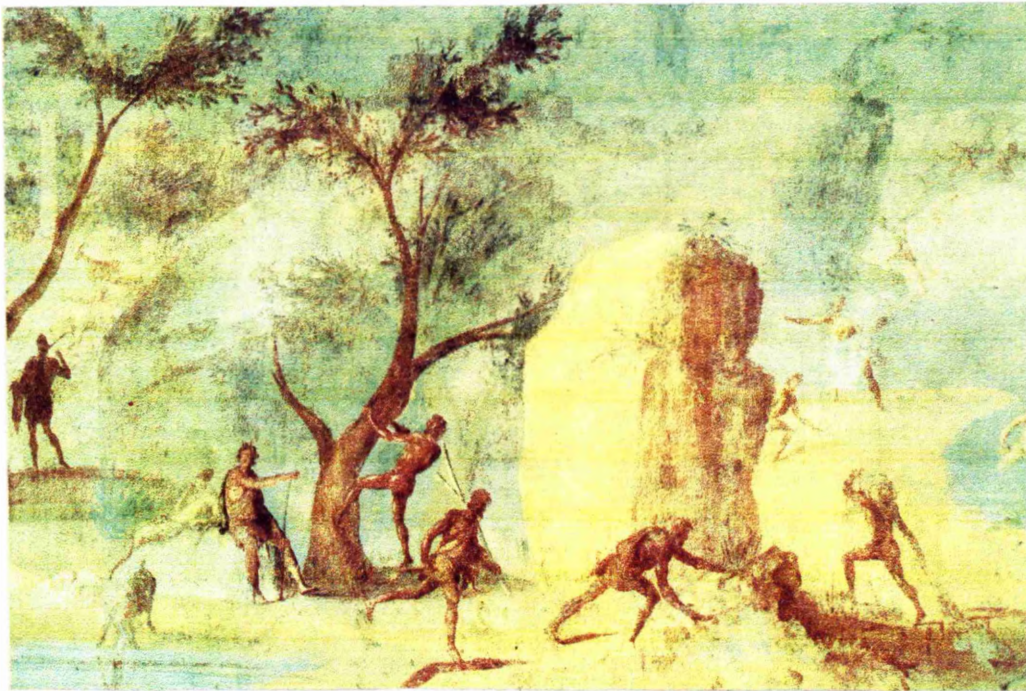


Plate 26: *Odysseus and The Laestrygonians*, detail of *Travels of Odysseus*,
fresco (transferred to canvas), c.50-40 B.C. Rome Vatican Museum.

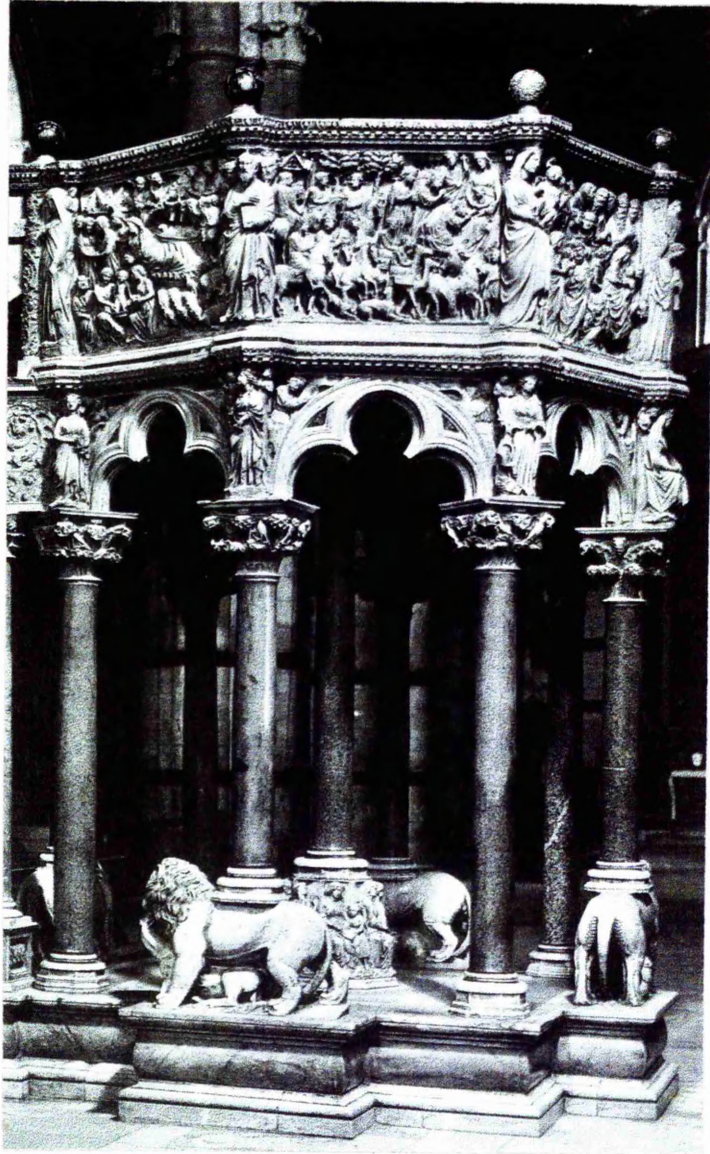


Plate 27: Nicola Pisano, *Pulpit*, marble, 1265-68, Siena, Duomo.



Plate 28: Maestro di Tressa, *Madonna degli occhi grossi* ?
painted low relief, c.1220, Siena, Museo del'Opera del Duomo.



Plate 29:
Stele of Hegeso,
Late 5th century B.C.,
Athens,
National Museum.

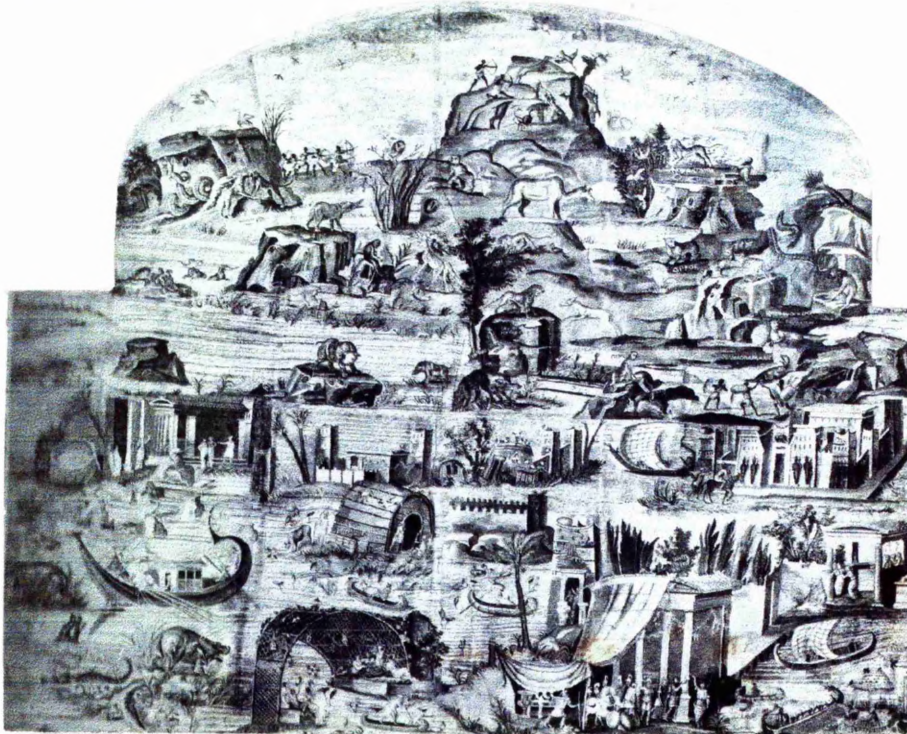


Plate 30: *Nile Mosaic*, mosaic, late 2nd century B.C., Palestrina, Palazzo Barberini.



Plate 31: Dioscurides of Samos, *Street Musicians*, mosaic, c.100 B.C.
Naples, National Archaeological Museum.



Plate 32: *Idyllic landscape*, fresco, 1st century A.D., from Pompeii.
Naples, National Archaeological Museum.



Plate 33: *Cityscape*, detail of Mural, 1st century B.C.,
from the Cubiculum of the Villa of P. Fannius Sinistor, Boscoreale,
New York, Metropolitan Museum.



Plate 34:
*Personification of
Macedonia,*
detail of fresco,
c.50-40 B.C., from
Villa of Fannius Sinistor,
Boscoreale,
Naples,
National Archaeological
Museum.



Plate 35:
Mural from Pompeii,
Baker's Shop, fresco,
3rd quarter 1st century A.D.
Naples,
National Archaeological
Museum.

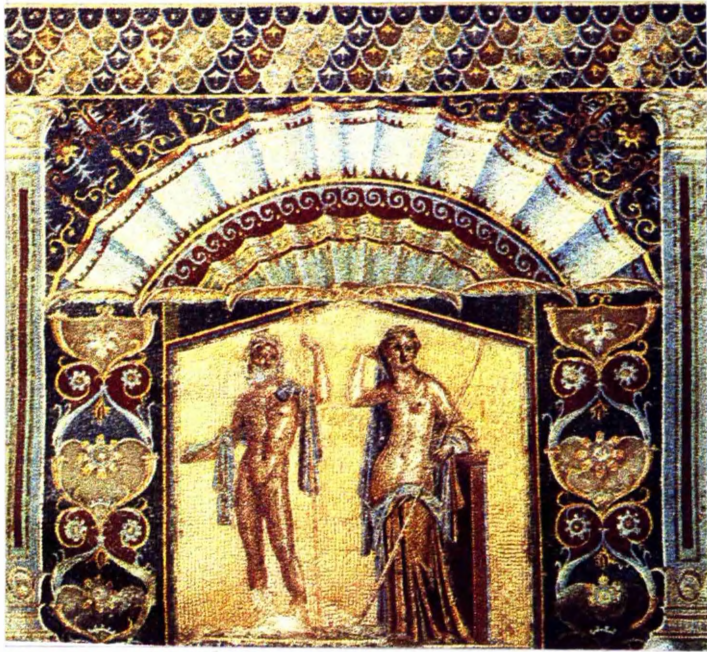


Plate 36:
Neptune and Amphitrite,
mosaic, c.60-80 A.D.,
Herculaneum,
House of Neptune and
Amphitrite.



Plate 37:
Iphigenia, detached fresco,
1st century A.D., Cat 111439,
Naples,
National Archaeological
Museum.

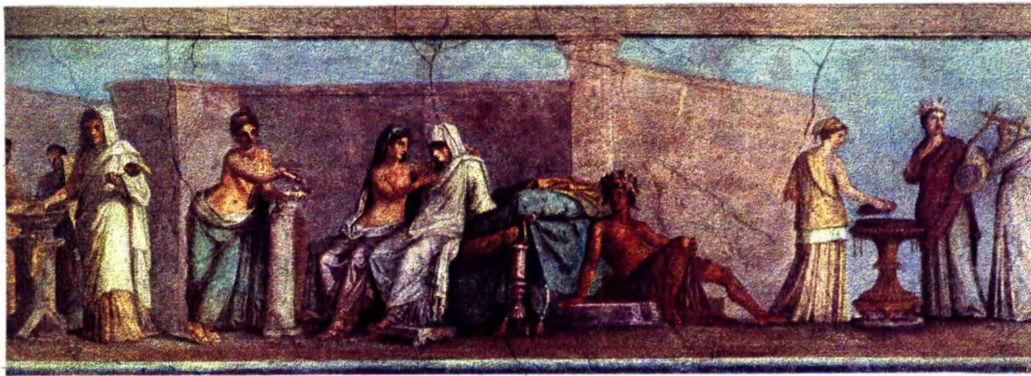


Plate 38: *Aldobrandini Wedding*, fresco. late 1st century A.D.
Rome, Vatican Museum.



Plate 39: *Aldobrandini Wedding*, detail, fresco. late 1st century A.D.,
Rome, Vatican Museum.

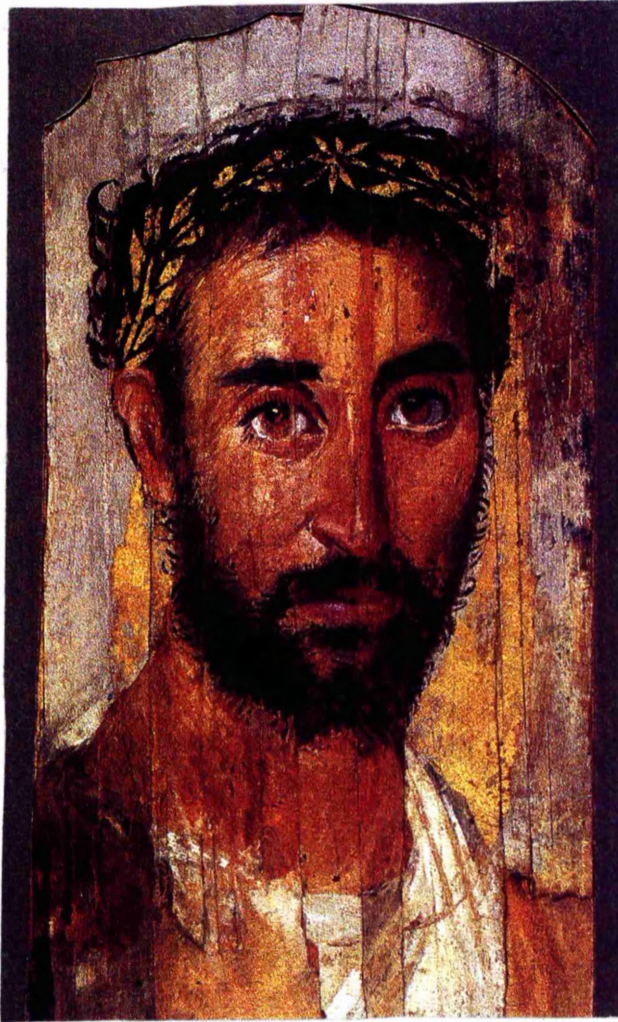


Plate 40:
Portrait of a Bearded Man,
tempera on lime wood,
c.150- 80 A.D.
London, British Museum.



Plate 41: *Portrait of a man with Sarapis and Isis*, tempera on wood. c.180-200 A.D.
Malibu, J.Paul Getty Museum.

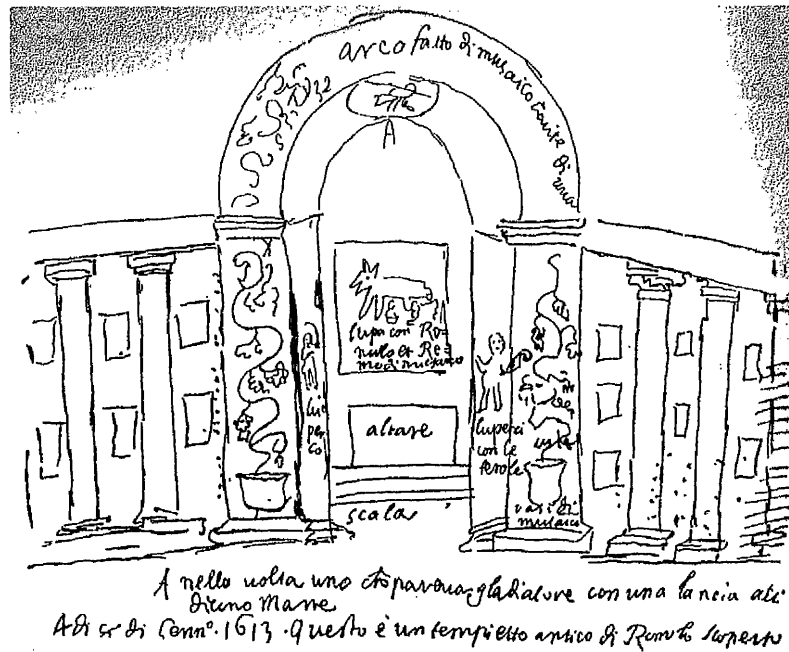


Plate 42: Decoration of 3rd century A.D. Lupercal Temple,
 after 17th century sketch by Grimaldi, (in C. Cecchelli
I Mosaici della Basilica di S. Maria Maggiore, Turin, 1956, and
 H.P.L'Orange & P.J.Nordhagen, *Mosaics*, trans., A.E.Keep,
 London, 1966, p.45).

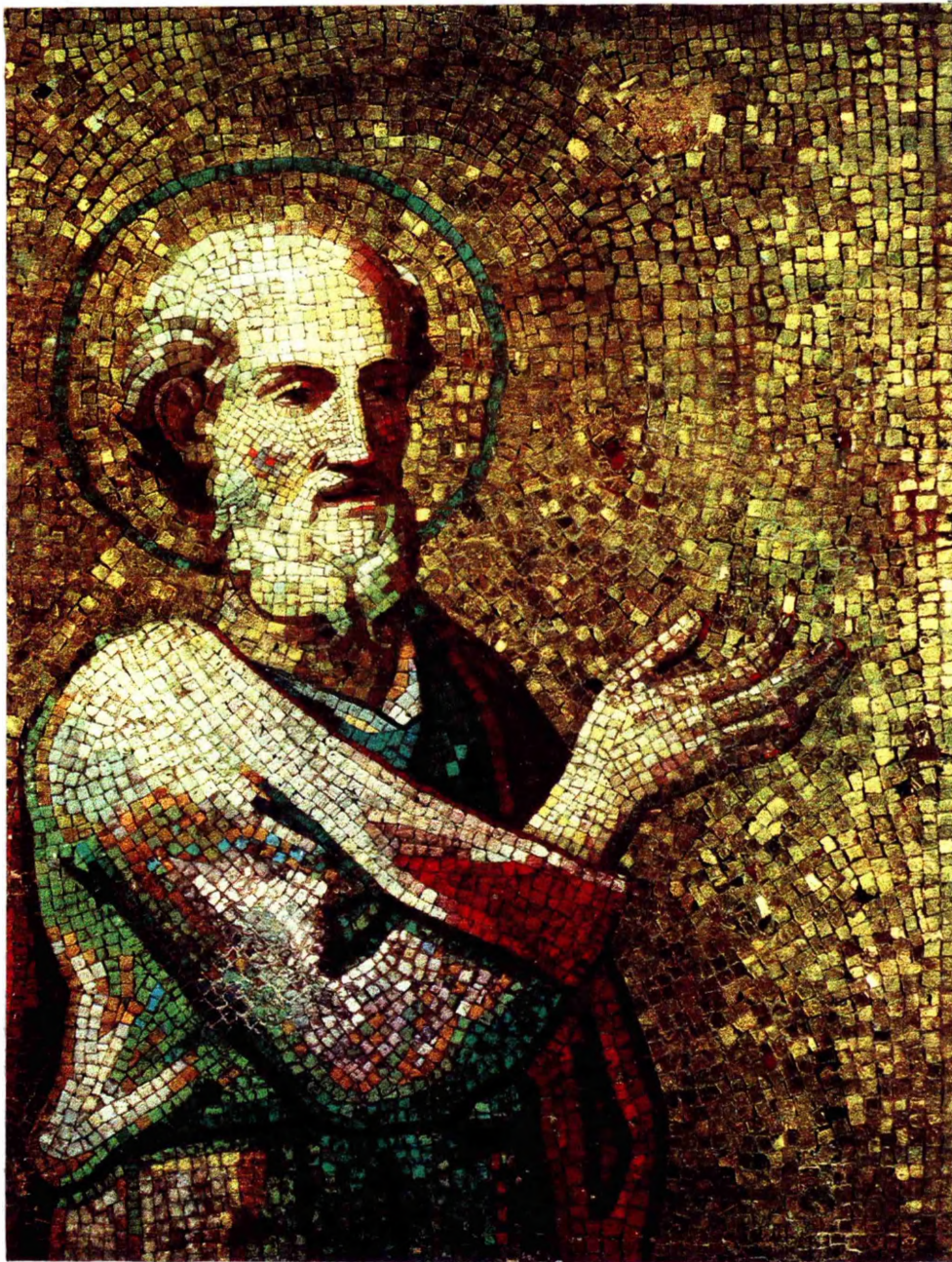


Plate 43: *St. Paul*, mosaic fragment, mid 4th century,
from Apse of old basilica of St Peter's,
Rome, Vatican Grottoes.

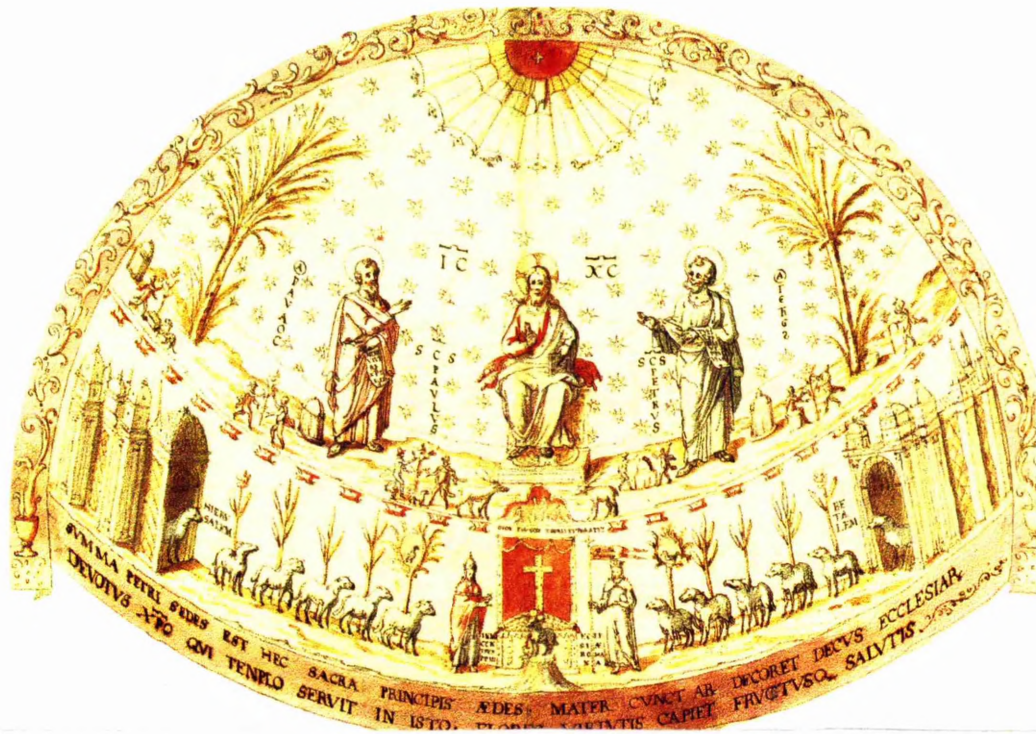


Plate 44: *Old St Peter's Apsidal Mosaic*, destroyed 1592,
watercolour sketch, c.1590, Vat. Lat. 5408, fol. 29v-30r,
Rome, Vatican Library.

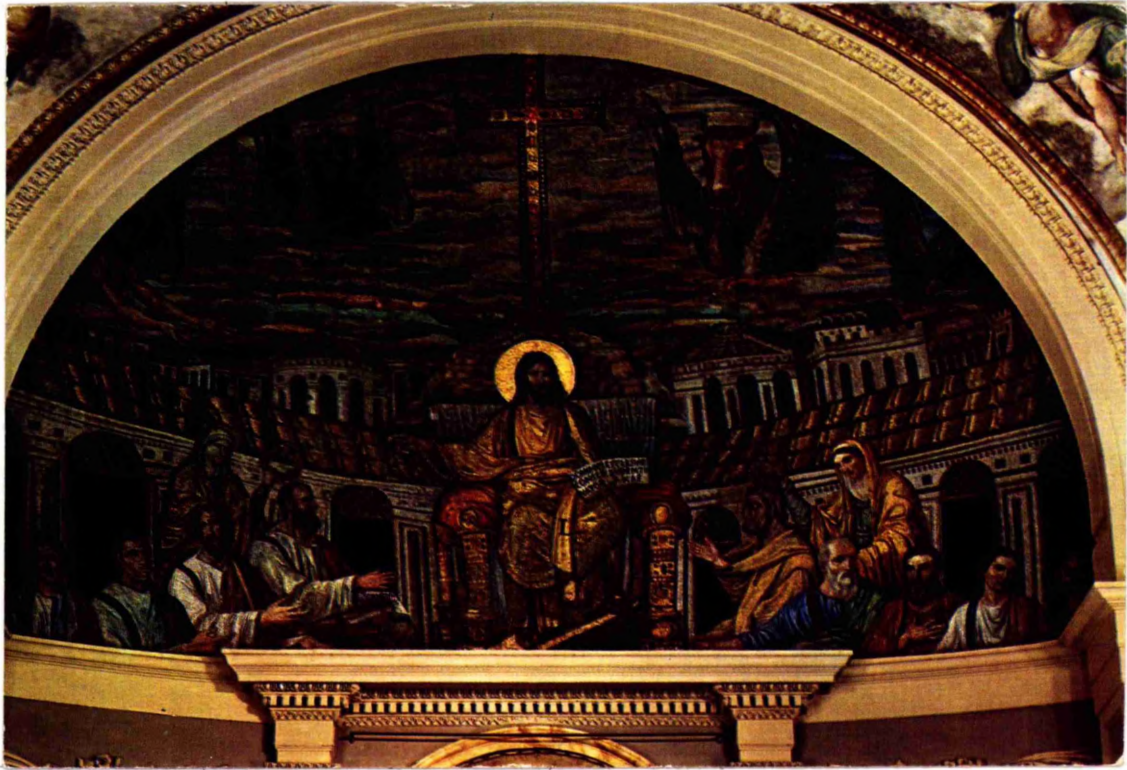


Plate 45: *Christ and Apostles*, Apse Mosaic, early 5th century,
Rome, Sta. Pudenziana.



Plate 46: *St. Paul*, detail of Apse Mosaic, *Christ and Apostles*, early 5th century,
Rome, Sta. Pudenziana.



Plate 47: *The Ark about to cross the Jordan*, mosaic, early 5th century, Rome, Sta. Maria Maggiore.



Plate 48: *Joshua sends out Spies*, mosaic, early 5th century, Rome, Sta. Maria Maggiore.



Plate 49: *The Good Shepherd*, mosaic. c.430-50,
Ravenna, Mausoleum of Galla Placidia.

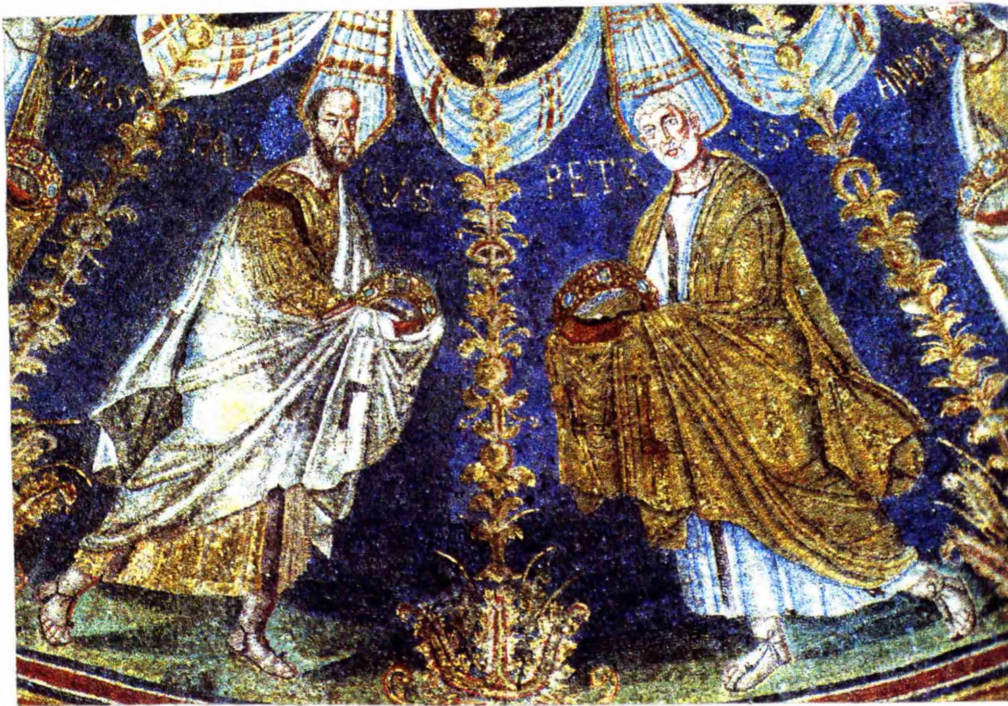


Plate 50: *SS. Paul and Peter*, detail of Dome, mosaic, c.500,
Ravenna, Neonian Baptistery.

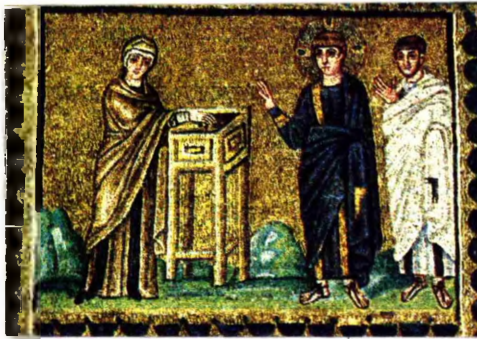


Plate 51: *Jesus and the Widow's Mite, The Loaves and Fishes, Healing the Blind Men, Marriage at Cana* mosaics, c.500-525, Ravenna, S.Apollinare Nuovo.



Plate 52: *St Peter Denies Christ*, mosaic, c.550, Ravenna, S.Apollinare Nuovo.



Plate 53: *St.Damiano and St.Paul*, detail of apse, mosaic c.530, Rome, SS. Cosma e Damiano.

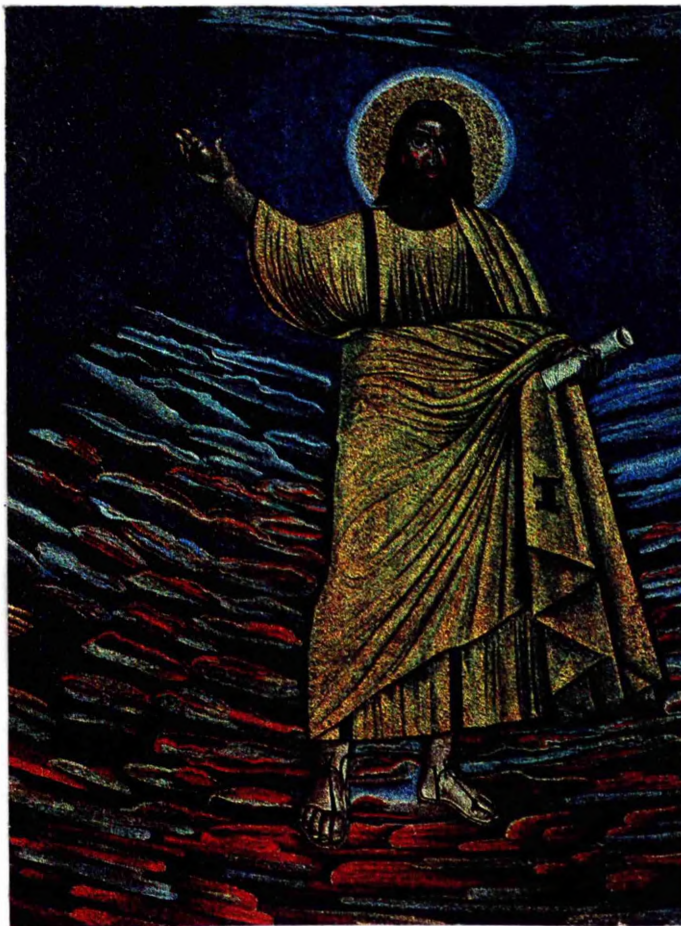


Plate 54:
Christ, detail of apse,
mosaic, c.530,
Rome, SS. Cosma e Damiano.



Plate 55: *SS. Peter, Damiano and Theodore*, detail of apse, mosaic, c.530, Rome, SS. Cosma e Damiano.

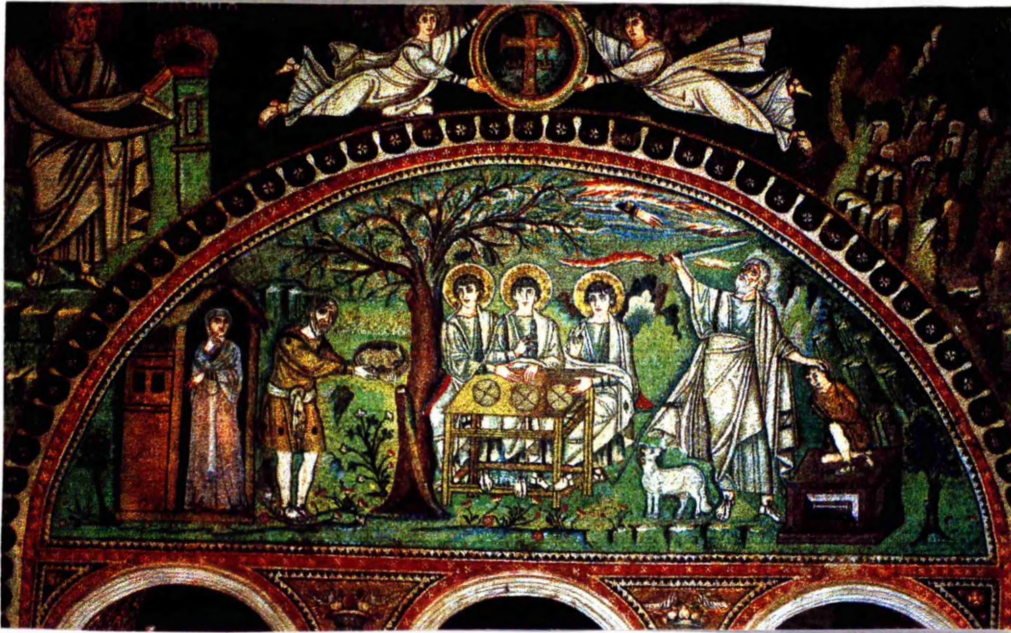


Plate 56: *Episodes of Abraham's Life*, mosaic, c.550,
Ravenna, S. Vitale, Presbytery North Lunette.



Plate 57: *Christ with Angels, S. Vitale and Bishop Ecclesius*, mosaic, c.550,
Ravenna, S. Vitale, Presbytery Apse.



Plate 58: *Theodora and her Court*, mosaic, c.548,
Ravenna, S. Vitale Presbytery.



Plate 59: *Justinian*, detail of *Presbytery Mosaic*, mosaic, c.550, Ravenna, S. Vitale.



Plate 60: *Justinian* , detail of *Presbytery Mosaic*, mosaic, c.550,
Ravenna, S.Vitale.



Plate 61: *S. Apollinaris Apse*, mosaic, c. 550,
Ravenna, S. Apollinare in Classe.



Plate 62: *S. Apollinaris* detail of *Apse Mosaic*, mosaic, c.560,
Ravenna, S.Apollinare in Classe.



Plate 63: *Sta. Agnese*, detail of apse, mosaic, c.625,
Rome, *Sta. Agnese fuori le Mura*.



Plate 64: *Christ*, detail of apse, mosaic, c.625-650, Rome, Baptistery of St John Lateran, Chapel of St Venantius.



Plate 65: Detail of *Restoration Working Diagram*, 1946-47, (from Oakeshott, *The Mosaics of Rome*).



Plate 66: *Madonna & Child*, detail of apse, mosaic, c.818,
Rome, Sta Maria in Domnica.



Plate 67: *Apse Mosaic, c.820, Rome, Sta.Prassede.*



Plate 68: *Christ with Pope Gregory and Saints, mosaic, c.825-850, Rome, S. Marco Apse.*



Plate 69: *Virgin and Child Apse Mosaic*, c.850, (destroyed 1922)
Nicaea, Church of the Assumption of the Virgin.



Plate 70 : *Christ and an Emperor*, mosaic, c.890 -910,
Istanbul, Hagia Sophia.



Plate 71: *Virgin and Child with Justinian and Constantine*, mosaic, c.1000,
Istanbul, Hagia Sophia.



Plate 72: *Nativity*, mosaic, c.1000,
Monastery Church of Hosios Lukas, Greece.



Plate 73: *Christ with Constantine IX and Empress Zoe*, mosaic, 1042-55, Istanbul, Hagia Sophia.



Plate 74: *Virgin and Child with Emperor John II Comnenus and Empress Eirene*, mosaic, c. 1118, Istanbul, Hagia Sophia.

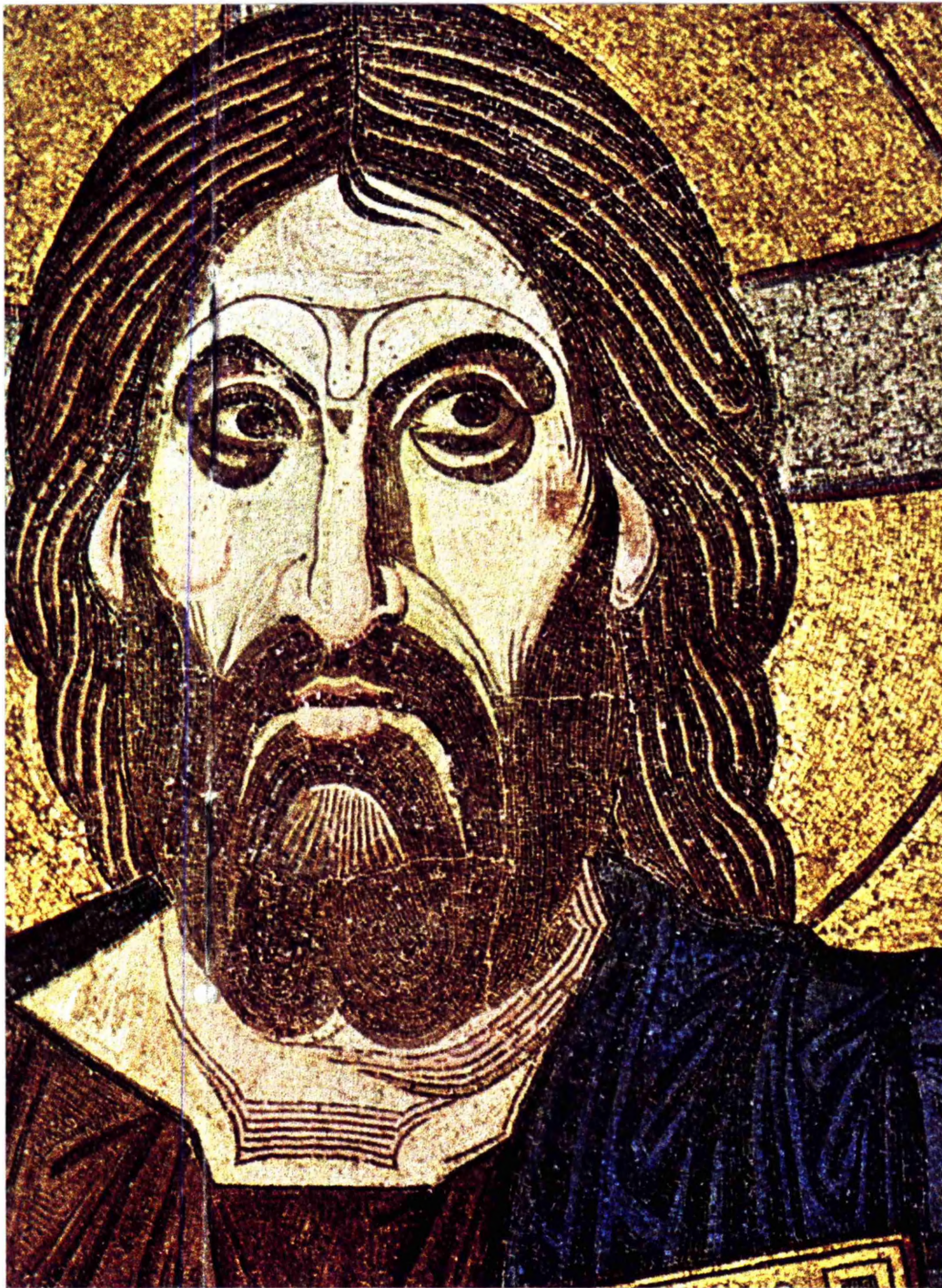


Plate 75: *Pantocrator*, mosaic, c.1100,
Athens, Monastery of Daphni.



Plate 76: *Incredulity of Thomas*, mosaic, c.1100,
Athens, Monastery of Daphni.



Plate 77: *St. John*, detail of *Crucifixion*, mosaic, c.1100,
Athens, Monastery of Daphni.



Plate 78: *Nativity*, mosaic, c.1100, Athens, Daphni Monastery.



Plate 79: *Apse Mosaic*, c.1125, Rome, S.Clemente.



Plate 80: *Christ enthroned with the Virgin*, detail of apse mosaic, c.1140, Rome, Sta.Maria in Trastevere.



Plate 81: *Pope Innocent, St Lawrence and Pope Calixtus*, detail of apse mosaic, c.1140, Rome, Sta Maria in Trastevere



Plate 82: *Sta.Francesca Romana Apse*, mosaic, mid 1100's,
Rome, Sta.Francesca Romana.



Plate 83: *St. James*, detail, *Sta. Francesca Romana Apse*, mosaic, mid 1100's,
Rome, *Sta. Francesca Romana*.



Plate 84: *Christ Crowning Roger II*, mosaic, 1143-51,
Palermo, "La Martorana".

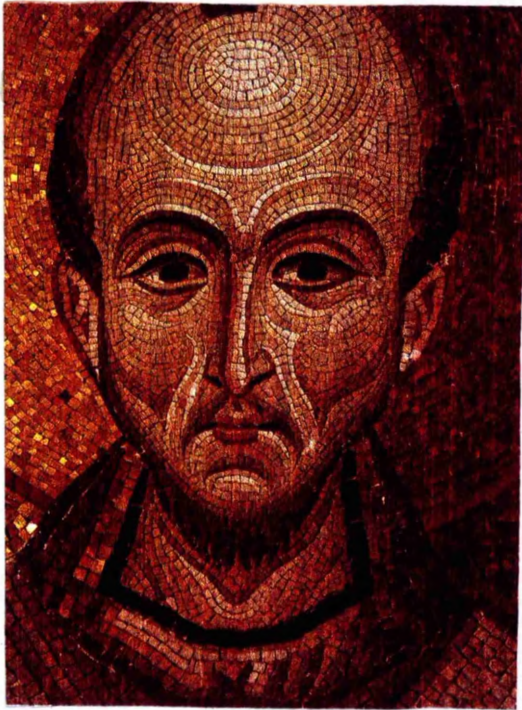


Plate 85:
St. John Chrysostom,
mosaic, c.1143,
Palermo, Cappella Palatina.



Plate 86:
Abraham's Sacrifice of Isaac,
mosaic, c.1150-60,
Palermo, Cappella Palatina.



Plate 87:
Abraham's Sacrifice of Isaac,
mosaic, c.1180-90,
Palermo, Monreale Cathedral.



Plate 88: *Stories of St. Paul*, mosaics, 1180-90, Palermo, Monreale Cathedral.

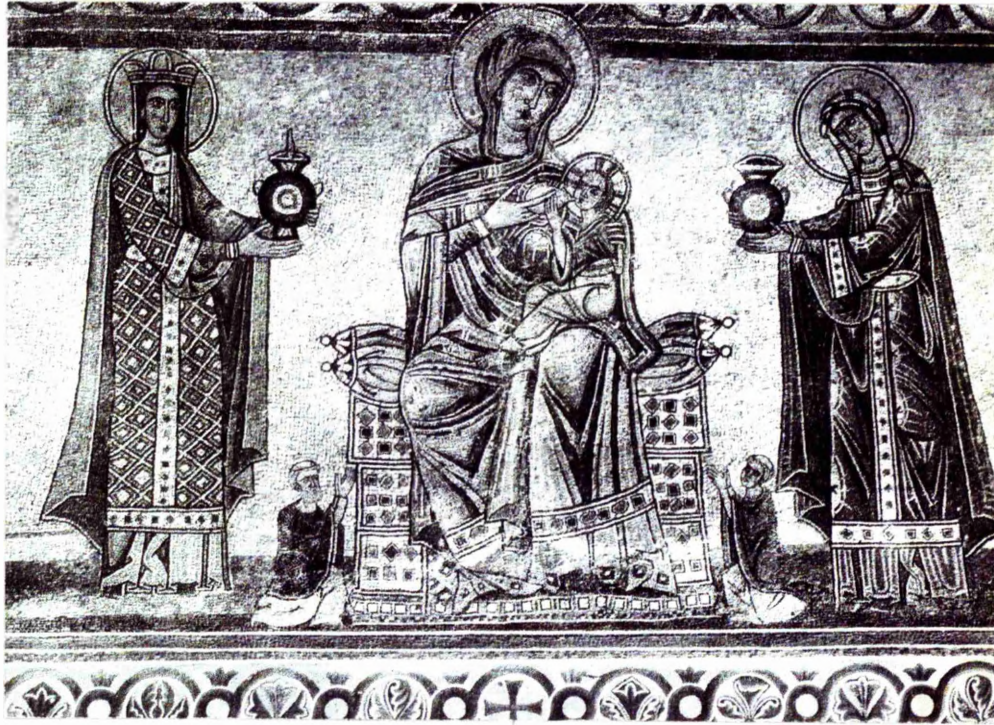


Plate 89: *Virgin and Female Saints*, detail of Facade, mosaic, c.1190, Rome, Sta.Maria in Trastevere.

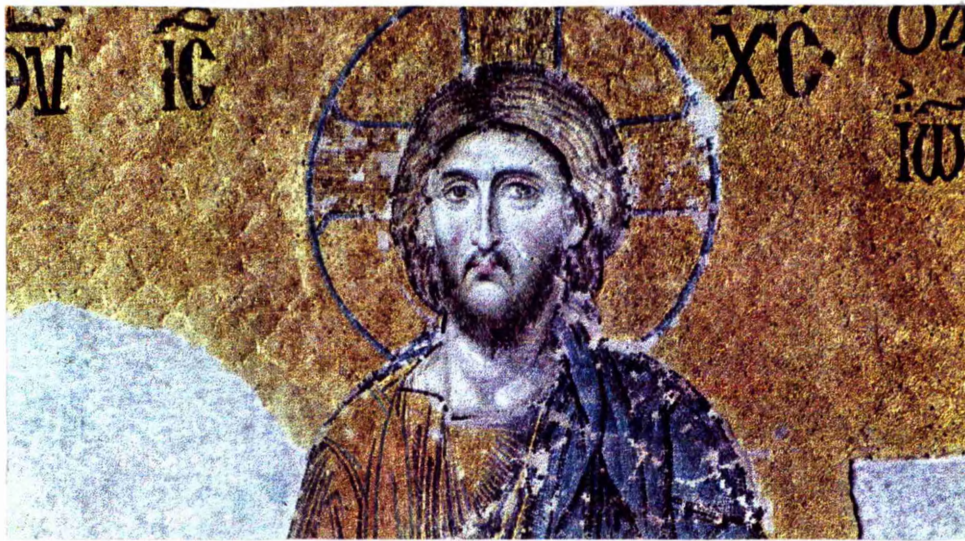


Plate 90: *Christ*, detail of *Deësis*, mosaic, c.1260s,
Istanbul, Hagia Sophia.



Plate 91: *Last Judgement*, detail of central *Deësis*, mosaic, c.1200, Torcello, Sta.Maria Assunta.



Plate 92: *Three Angels*, detail of *Last Judgement*, mosaic, c.1200, Torcello, Sta.Maria Assunta.



Plate 93: *Pope Innocent III*, fragment of Old St. Peter's Apse, destroyed 1592, mosaic, c.1210-16, Rome, Museo di Palazzo Braschi.



Plate 94: *Virgin and Child*, detail of apse vault, mosaic, c.1202-1226, Florence, Baptistery.

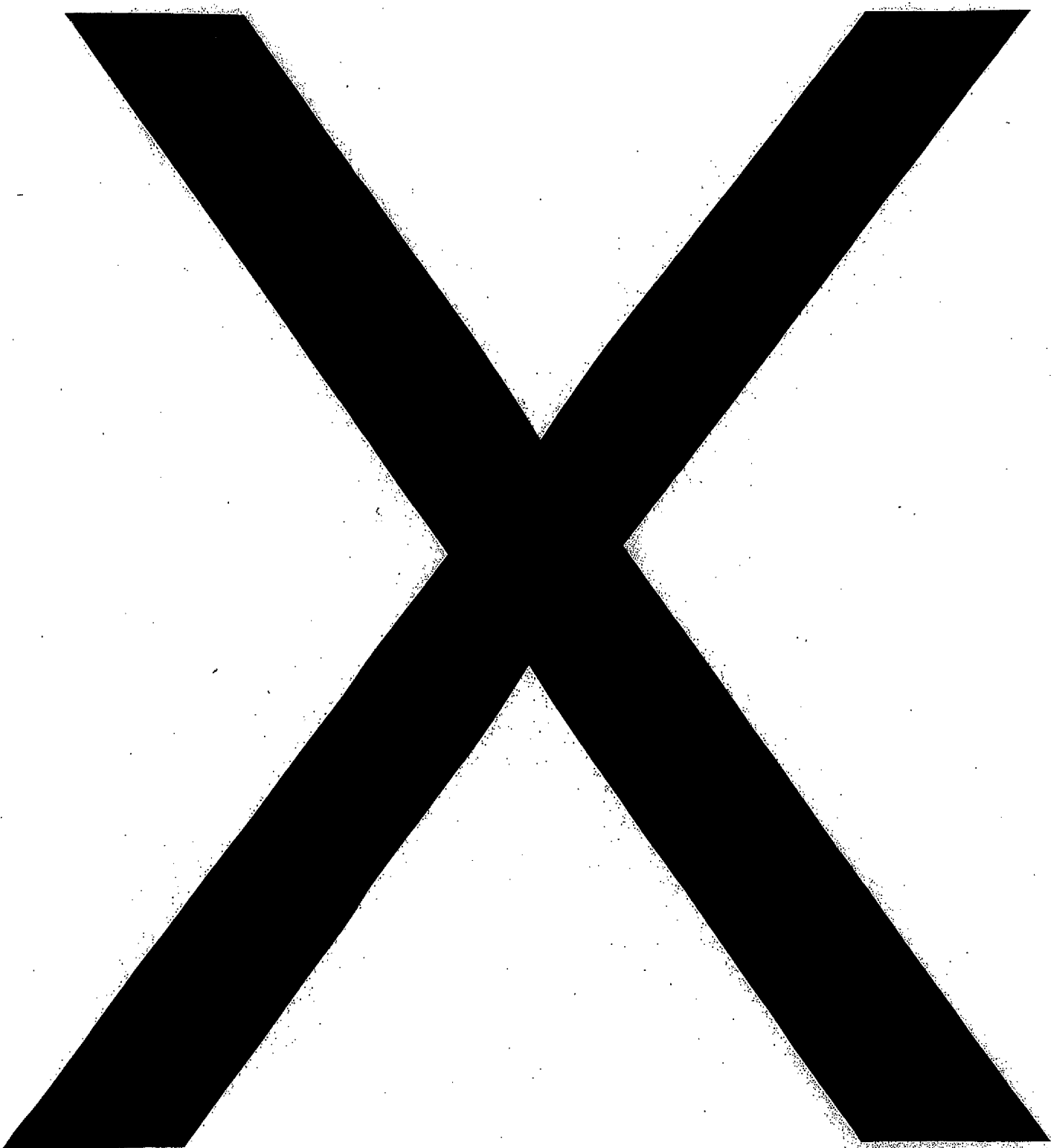




Plate 96: *St. Peter*, fragment of apsidal mosaic, c.1220,
Rome. S. Paolo fuori le Mura, Sacristy.



Plate 97: *Moses Strikes Water from the Rock, and the Fall of Manna*,
mosaic, c.1280s, Venice, San Marco.



Plate 98: *Christ Blessing*, detail of apse, mosaic, 1297,
Florence, S. Miniato al Monte.



Plate 99: *Jacob Blessing the Sons of Joseph*, from the Vienna Genesis, p.45, 6th century, Vienna, Österreichische Nationalbibliothek.



Plate 100: *St Mark*, from the Ada Gospels, MS. 22, fol.59 v., late 8th/early 9th-century, Trier, Stadtbibliothek.



Plate 101: Coronation Gospel Group, *St John*,
from the Vienna Coronation Gospels, folio 178 verso, c.800,
Vienna, Weltliche Schatzkammer der Hofburg.



Plate 102: Coronation Gospel Group, *The Four Evangelists*,
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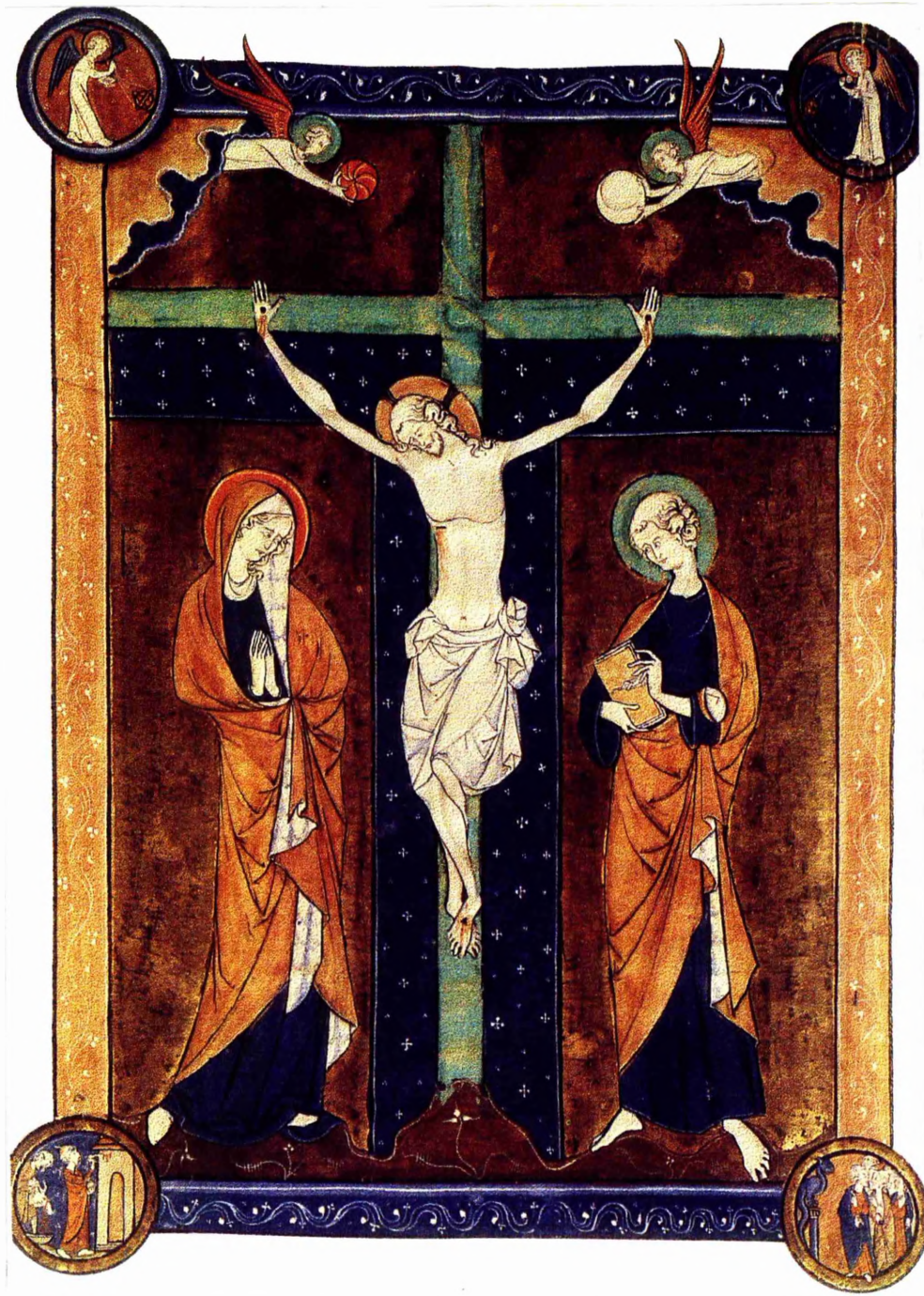


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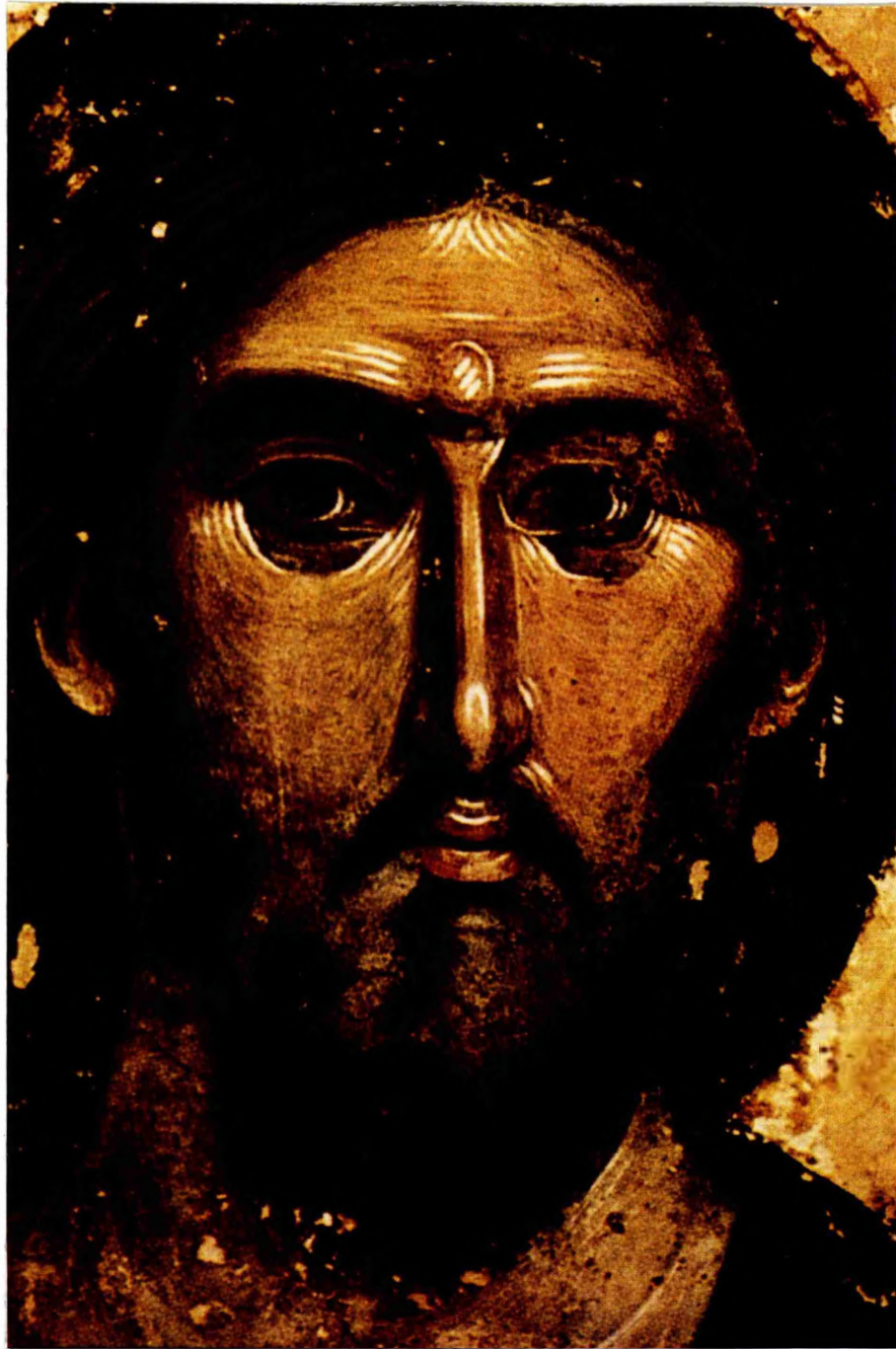


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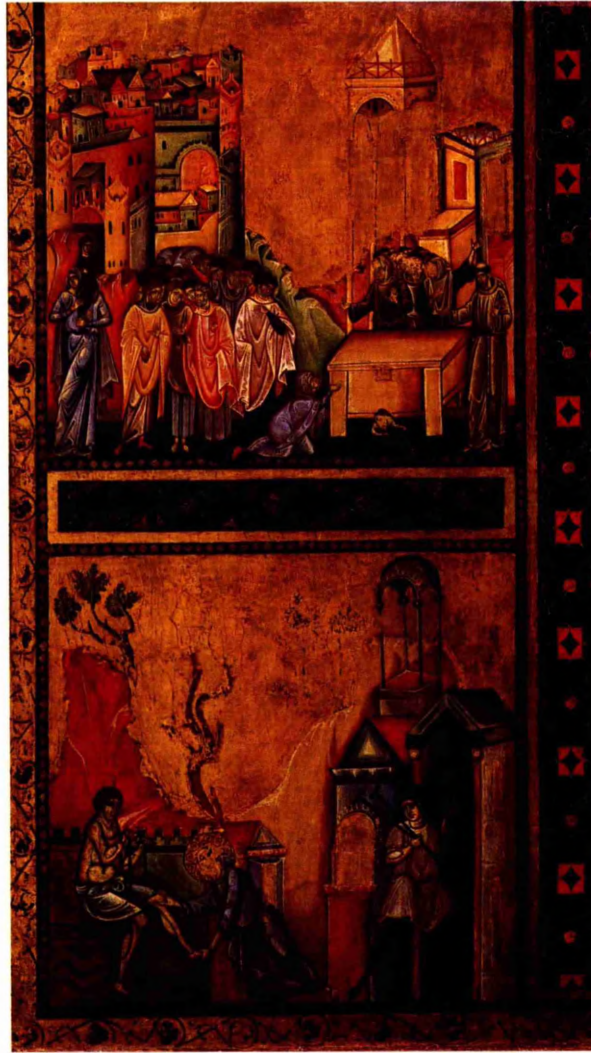


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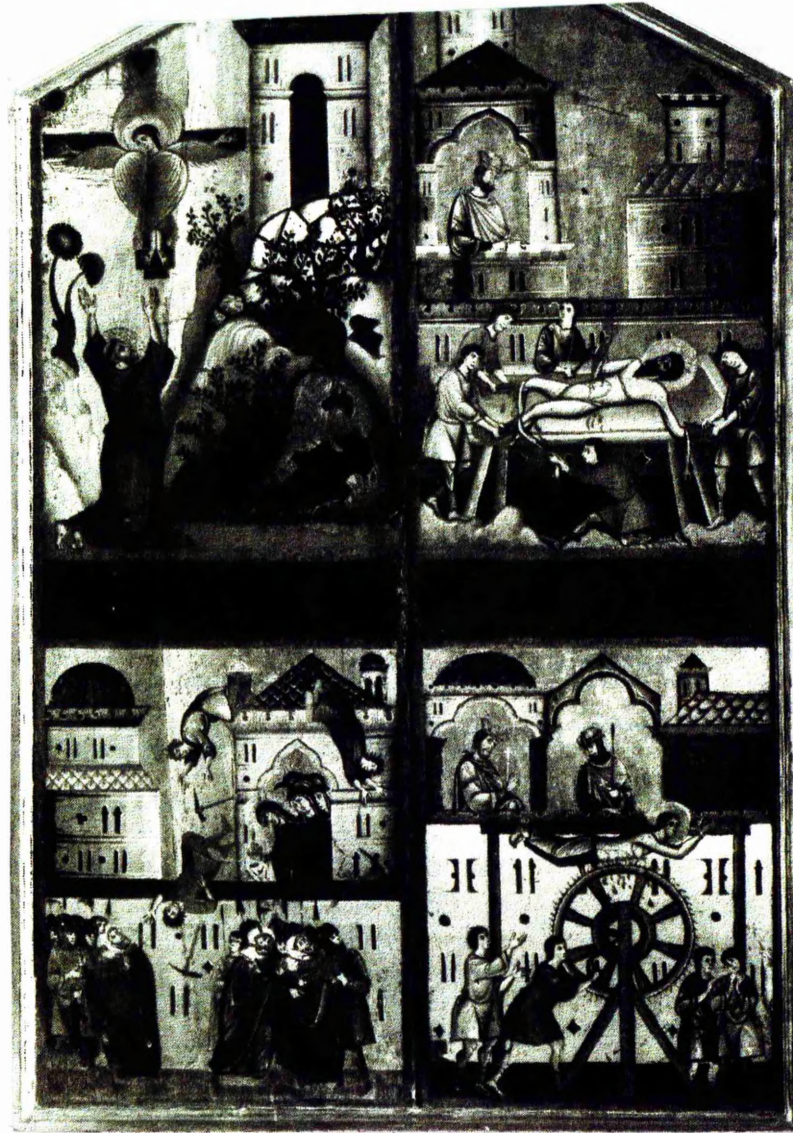


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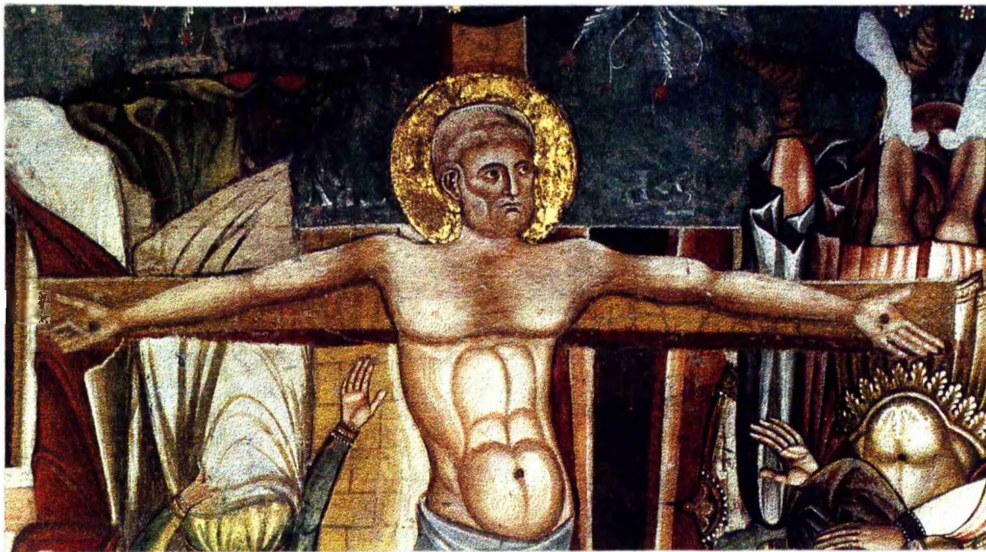


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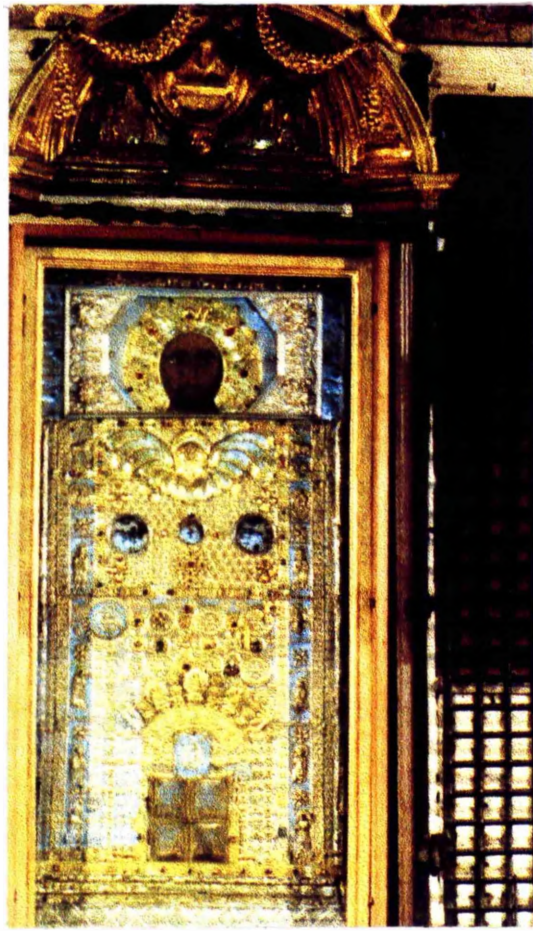


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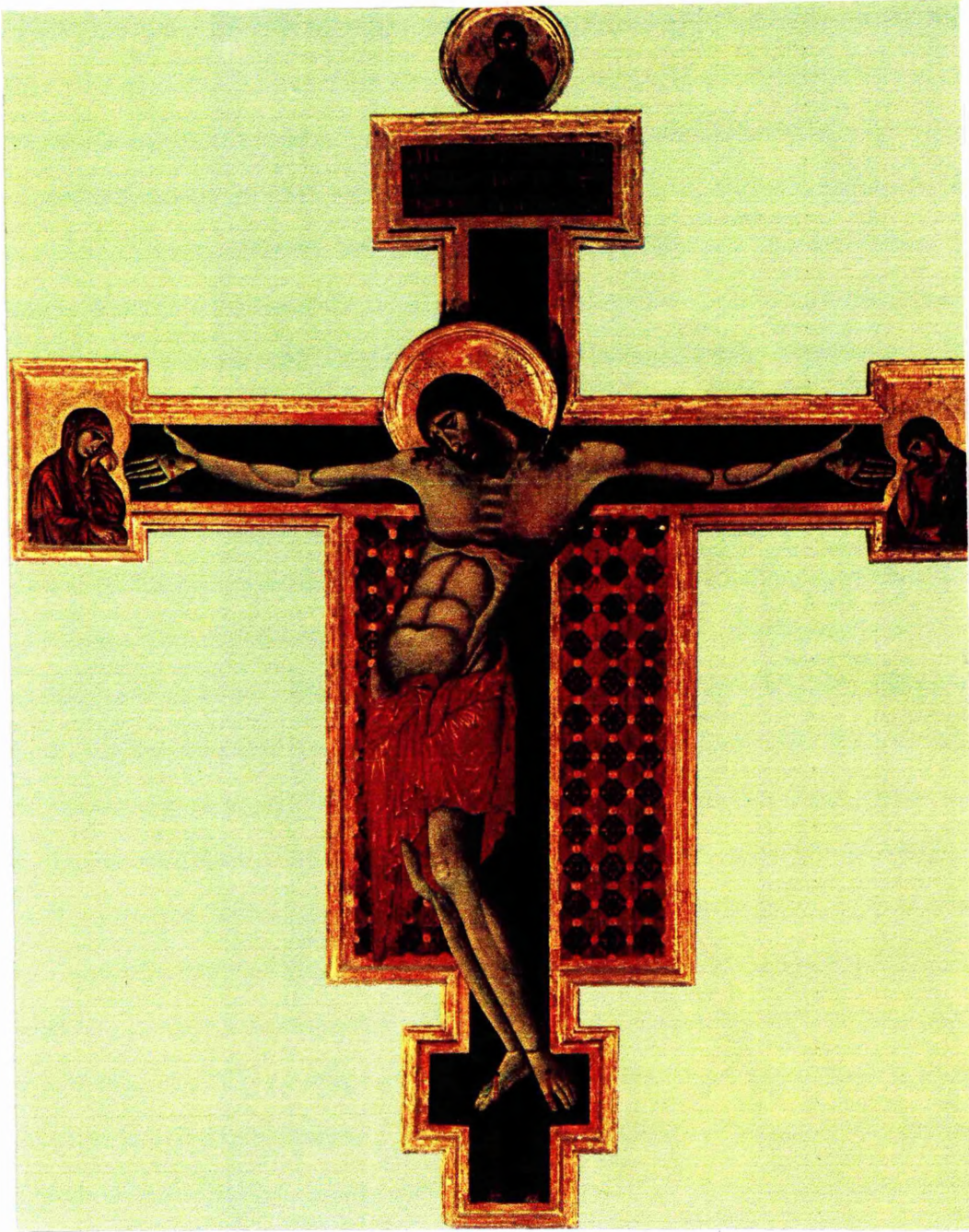


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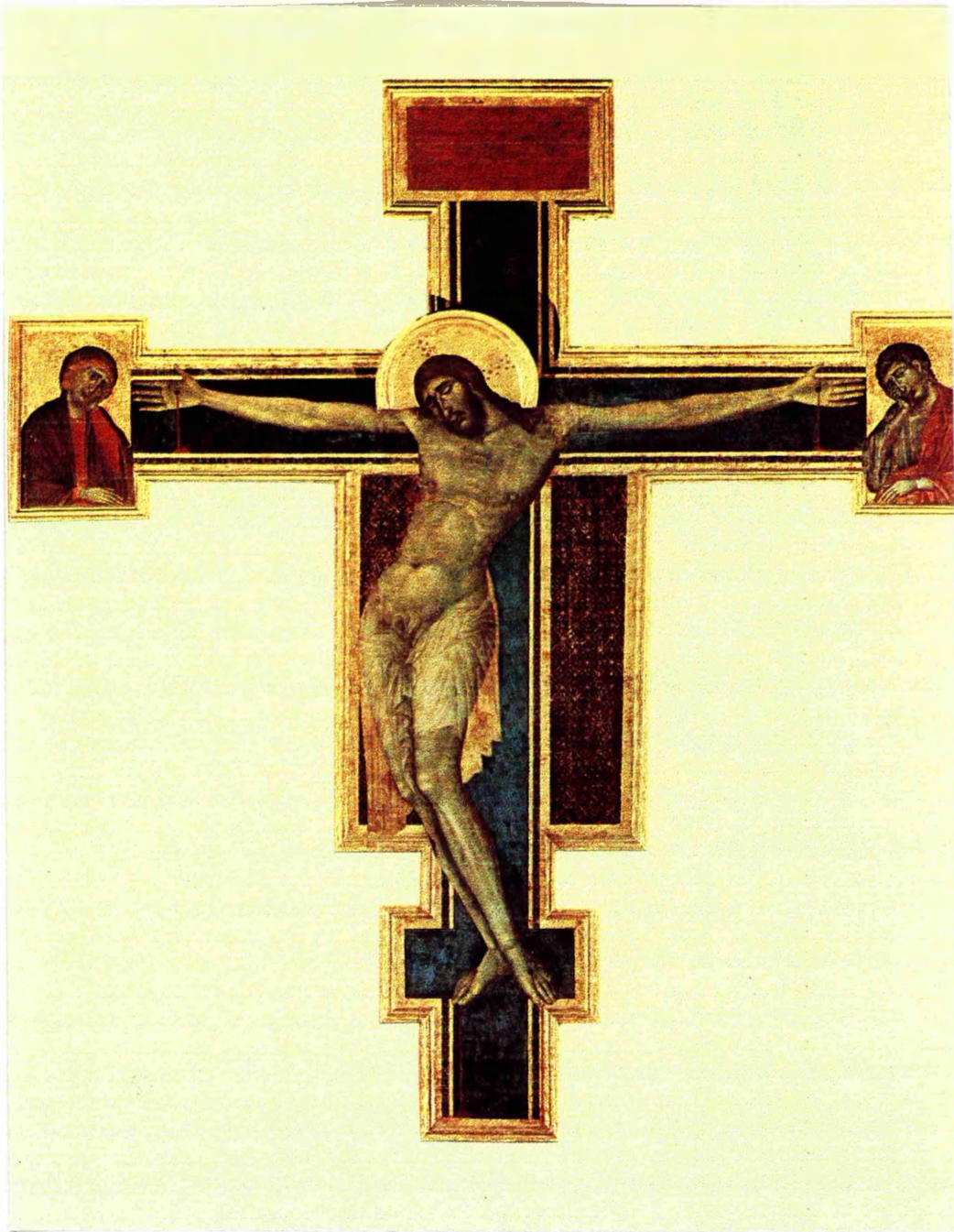


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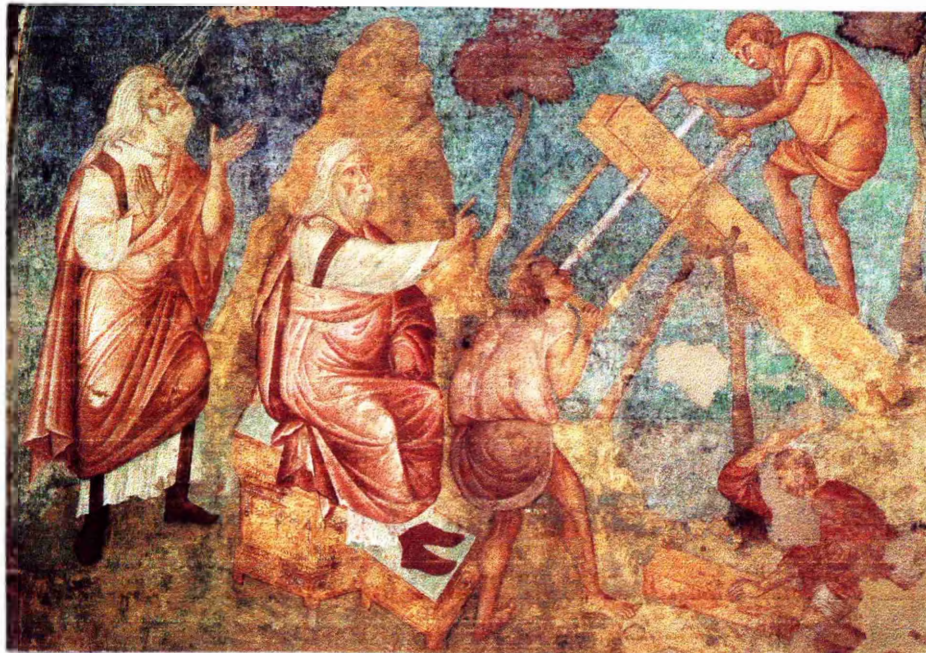


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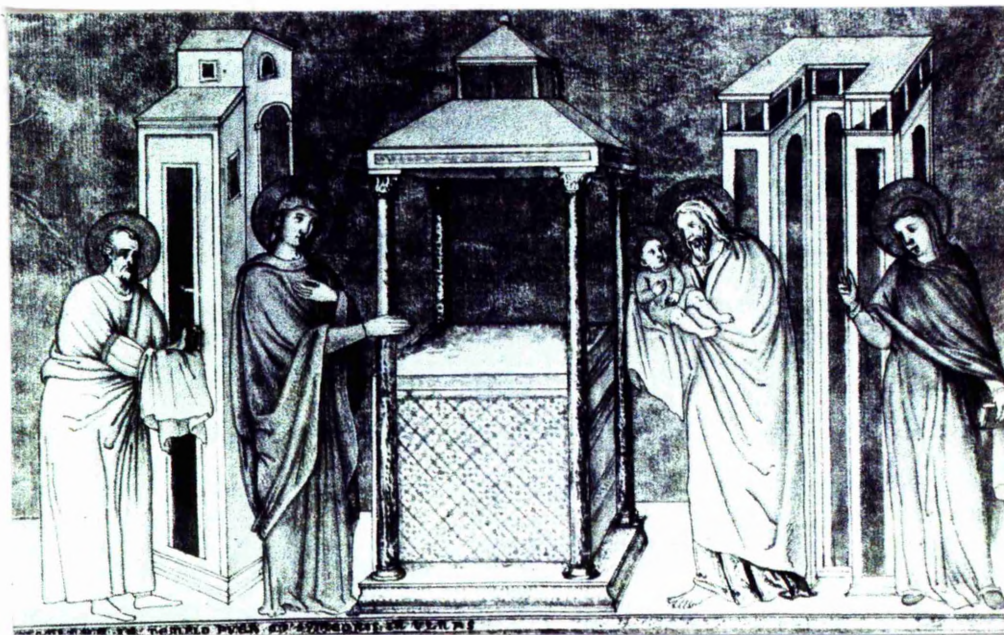


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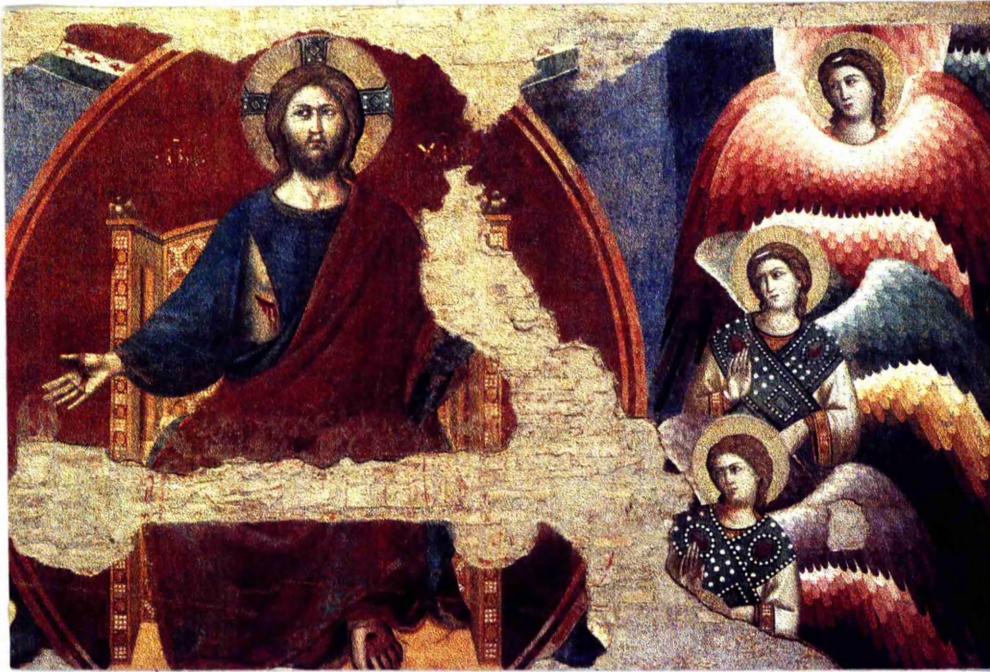


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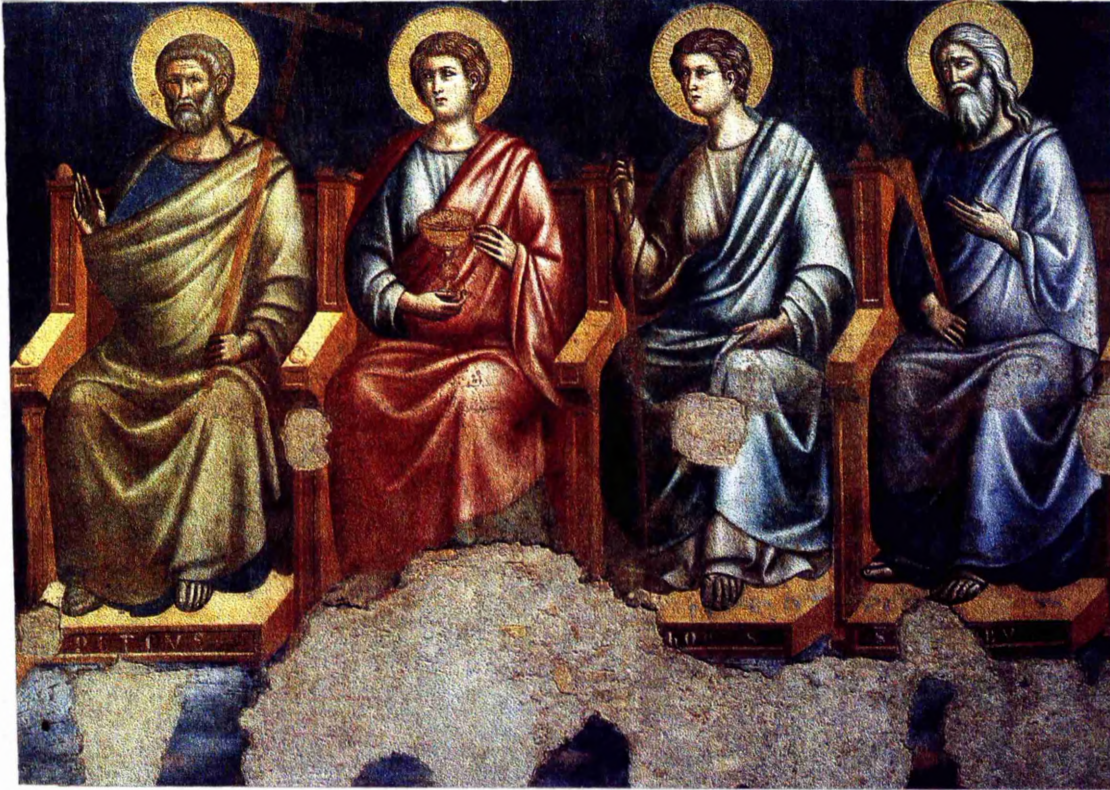


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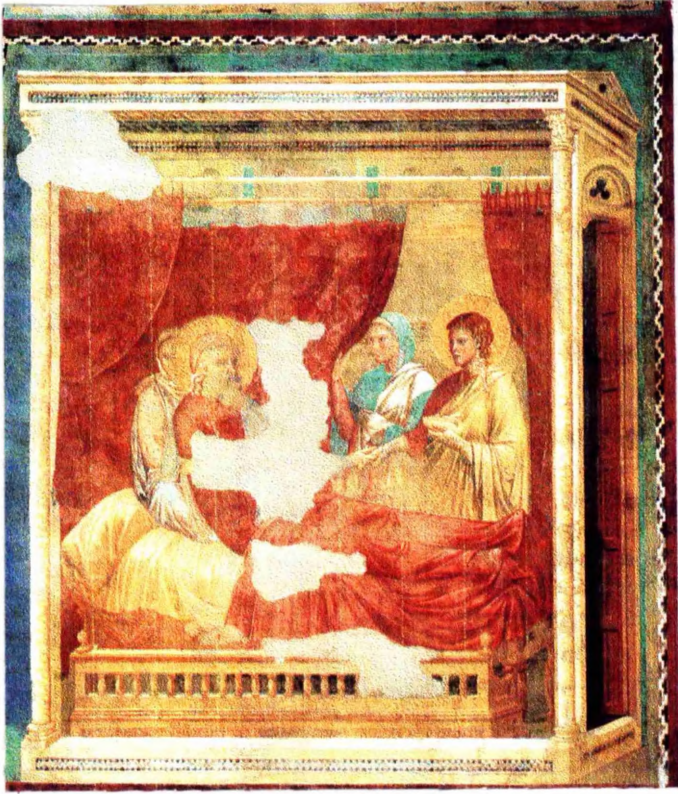


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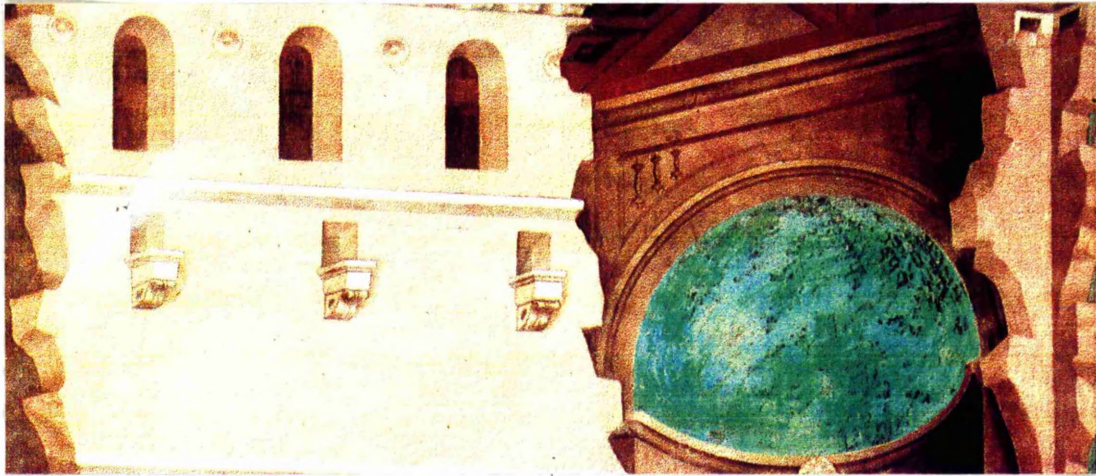


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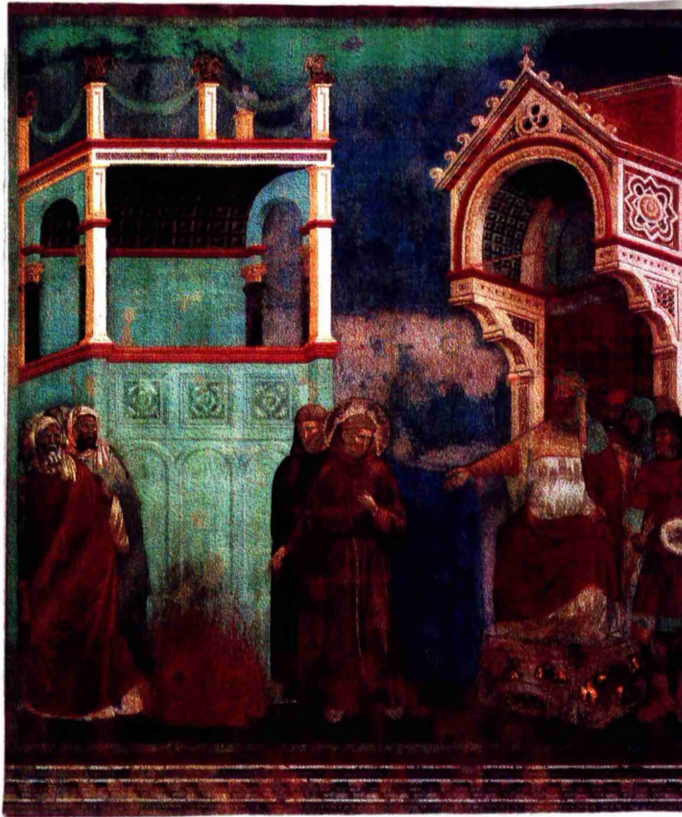


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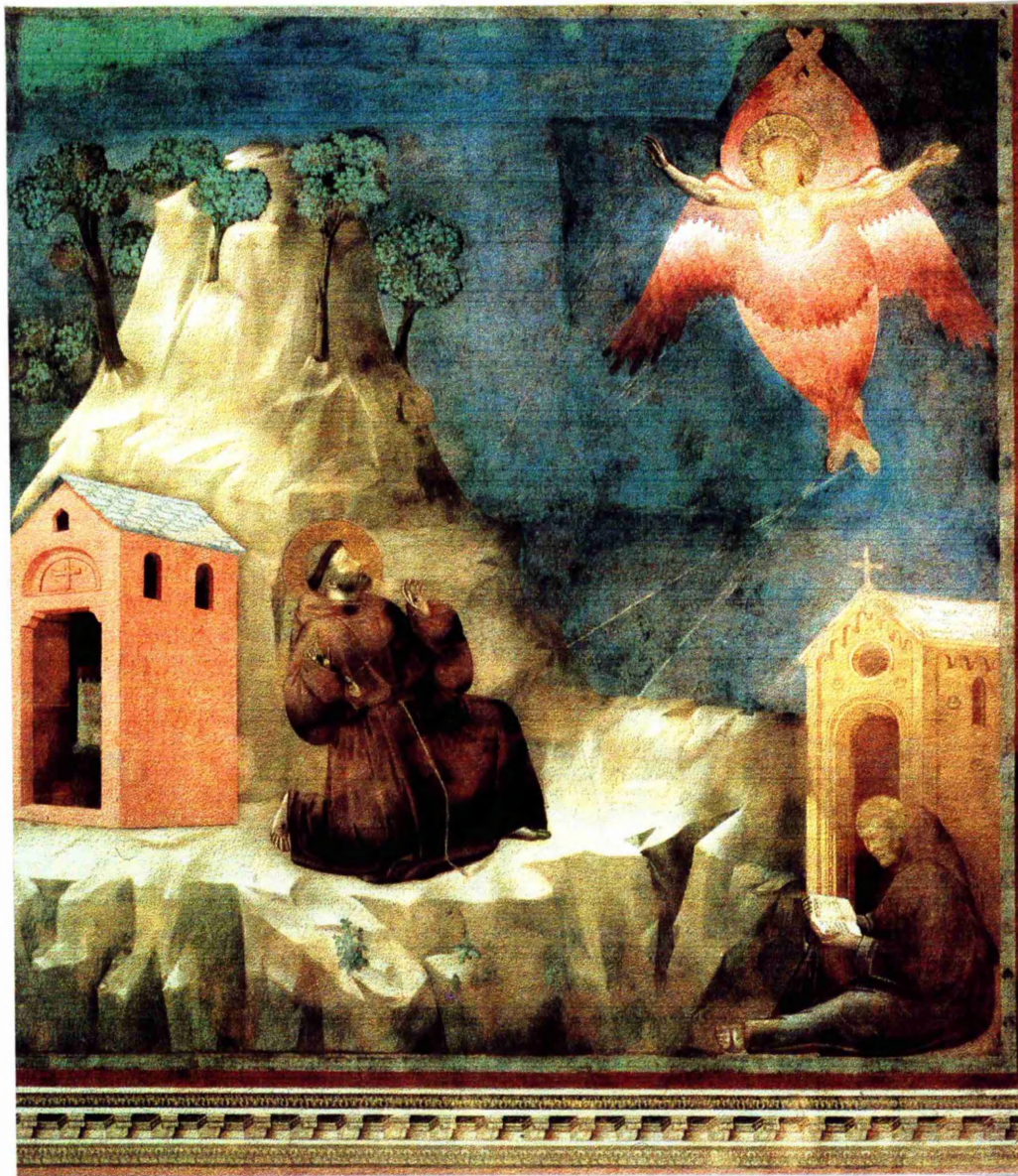


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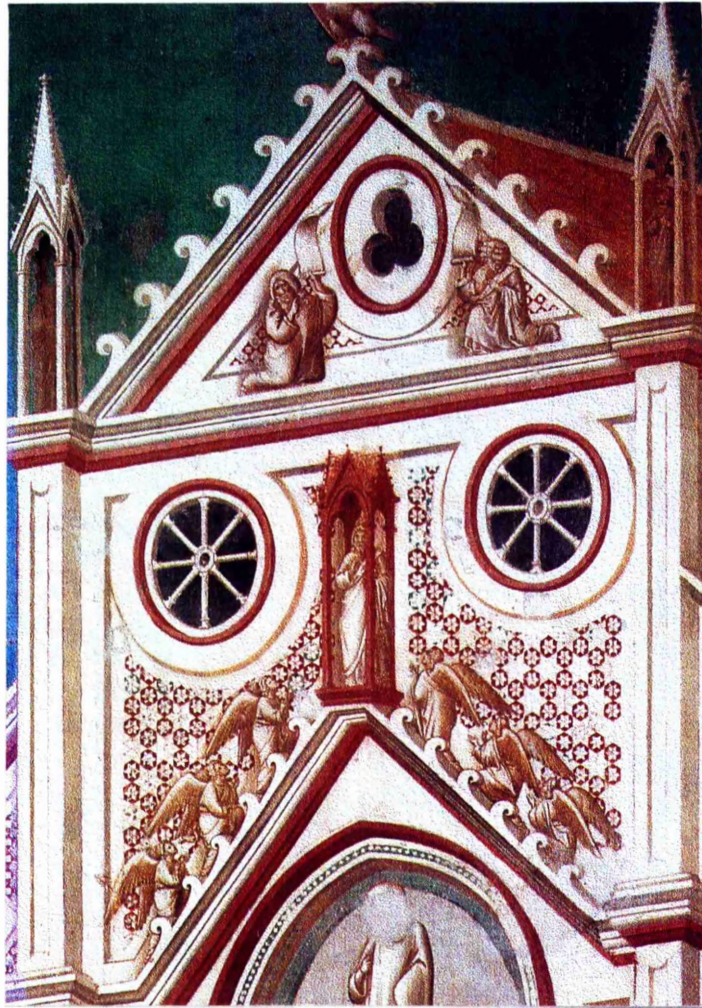


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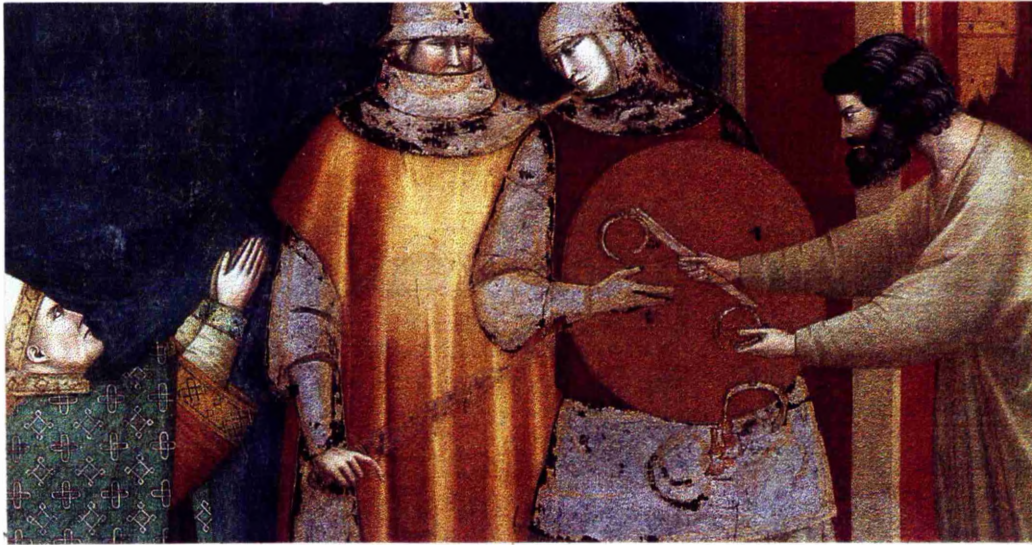


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A LOOK AT THE TREATMENT OF LIGHT AND SHADE IN PAINTERS'

QUEST FOR SPATIAL REALISM IN 13TH AND 14TH CENTURY ITALY

VOLUME THREE OF THREE

PLATES 213 - 419

by

JOHN BLACK

THESIS SUBMITTED FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF GLASGOW

DEPARTMENT OF HISTORY OF ART

September 2001

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- 260: Taddeo Gaddi, *Water Bottle and Shadow*, detail from *Annunciation to The Shepherds*, fresco, c.1328, Florence, S.Croce, Baroncelli Chapel.
- 261: Taddeo Gaddi, *Presentation of the Virgin*, fresco, c.1328, Florence, S.Croce, Baroncelli Chapel.
- 262: Taddeo Gaddi, detail of *The Virgin's Presentation*, fresco, c.1328, Florence, S.Croce, Baroncelli Chapel.
- 263: Taddeo Gaddi, *Theological Virtue, Prudence*, fresco, c.1328, Florence, S.Croce, Baroncelli Chapel.
- 264: Taddeo Gaddi, *The Meeting at the Golden Gate*, fresco, c.1328, Florence, S.Croce, Baroncelli Chapel.
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- 266: Taddeo Gaddi or Workshop, *Stigmatisation of St.Francis*, c.1340-50, fresco, Florence, S.Croce Refectory.
- 267: Giovanni da Milano, *Expulsion of Joachim*, fresco, c.1365-69, Florence, S.Croce Rinuccini Chapel.
- 268: Duccio, *Crevole Madonna*, tempera, c.1280, Siena, Museo dell'Opera del Duomo
- 269: Duccio, detail of *Crevole Madonna*, tempera, c.1280, Siena, Museo dell'Opera del Duomo.
- 270: Duccio, *Rucellai Madonna*, tempera c.1285, Florence, Uffizi.
- 271: Duccio, detail of *Rucellai Madonna*, tempera, c.1285, Florence, Uffizi.

- 272: Duccio, detail of *Rucellai Madonna*, tempera, c.1285, Florence, Uffizi.
- 273: Duccio, *Madonna of the Franciscans*, tempera, c.1290, Siena, Museo dell'Opera del Duomo.
- 274: Duccio *Triptych, Virgin and Child with SS. Dominic and Aurea*, tempera, c.1300, London, National Gallery.
- 275: Duccio, Polyptych No.28, tempera, c.1305, Siena, Pinacoteca.
- 276: Duccio, *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 277: Duccio, *Madonna and Child*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 278: Duccio, *St.Catherine*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 279: Duccio, *St.Agnes*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 280: Duccio, *Annunciation of the Virgin's Death*, detail of *Maestà*, 1308-11, Siena, Museo dell'Opera del Duomo.
- 281: Duccio, *Gabriel*, detail of *Annunciation of the Virgin's Death, Maestà*, tempera, 1308-1311, Siena, Museo dell'Opera del Duomo.
- 282: Duccio, *Funeral of the Virgin*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 283: Duccio, detail of *Funeral of the Virgin, Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 284: Duccio, *Annunciation*, detail of *Maestà Predella*, tempera, 1308-1311, Siena, Museo dell'Opera del Duomo.
- 285: Duccio, *Nativity*, detail of *Maestà Predella*, tempera, 1308-11, Washington, National Gallery of Art.
- 286: Duccio, *Pharisees Accuse Christ*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 287: Duccio, detail of *Pharisees Accuse Christ, Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 288: Duccio, *Entry to Jerusalem*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 289: Duccio, *The Washing of Feet*, detail of *Maestà*, tempera, 1308-1311, Siena, Museo dell'Opera del Duomo.
- 290: Duccio, *Last Supper*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 291: Duccio, *Arrest of Christ*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 292: Duccio, *Pilate's First Interrogation of Christ*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 293: Duccio, *Entombment*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 294: Duccio, *Doubting Thomas*, detail of *Maestà*, tempera, 1308-1311, Siena, Museo dell'Opera del Duomo.
- 295: Duccio, *Pentecost*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.
- 296: Duccio, *Temptation on the Mount*, detail of *Maestà*, tempera, 1308-11, New York, Frick Collection.
- 297: Duccio, *Wedding at Cana*, detail of *Maestà*, tempera, 1308-1311, Siena, Museo dell'Opera del Duomo.

- 298: Duccio, *Healing of the Blind Man*, detail of *Maestà*, tempera, 1308-11, London, National Gallery.
- 299: Duccio, *Transfiguration*, detail of *Maestà*, tempera, 1308-11, London, National Gallery.
- 300: Ugolino di Nerio, *Arrest of Christ*, detail of S.Croce Altarpiece, tempera, 1324-1325, London, National Gallery.
- 301: Ugolino di Nerio, *Moses*, detail from S.Croce Altarpiece, tempera, c. 1324-25, London, National Gallery.
- 302: Pietro Lorenzetti, *South Transept Lower Church S.Francesco Assisi, General View*, fresco, c. 1317-20, Assisi, S.Francesco.
- 303: Sketch of direction of pictorial light in Plate 302 above.
- 304: Pietro Lorenzetti, *Entry to Jerusalem*, fresco, c. 1317-20, Assisi, S.Francesco Lower Church.
- 305: Pietro Lorenzetti, *Disciples' Faces*, detail of *Entry to Jerusalem*, fresco, c. 1317-20, Assisi, S.Francesco Lower Church.
- 306: Pietro Lorenzetti, *Shadows*, Detail of *Entry to Jerusalem* showing wall shadows, fresco, c. 1317-1320, Assisi, S.Francesco Lower Church.
- 307: Pietro Lorenzetti, *Christ Washing His Disciples' Feet*, fresco, c. 1317-20, Assisi, S.Francesco, Lower Church.
- 308: Pietro Lorenzetti, *Last Supper*, fresco, c. 1317-1320, Assisi, S.Francesco, Lower Church.
- 309: Pietro Lorenzetti, detail of *Last Supper*, fresco, c. 1317-1320, Assisi, S.Francesco, Lower Church.
- 310: Pietro Lorenzetti, *Arrest of Christ*, fresco, c. 1317-1320, Assisi, S.Francesco, Lower Church.
- 311: Pietro Lorenzetti, *Flagellation*, fresco, c. 1317-20, Assisi, S.Francesco, Lower Church.
- 312: Pietro Lorenzetti, *Crucifixion*, fresco, c. 1317-1320, Assisi, S.Francesco, Lower Church.
- 313: Pietro Lorenzetti, *Stigmatisation of St. Francis*, fresco, c. 1317-20, Assisi, S.Francesco, Lower Church.
- 314: Pietro Lorenzetti, *Trompe l'oeil Bench and Niche*, fresco, c. 1317-1320, Assisi, S.Francesco, Lower Church.
- 315: Pietro Lorenzetti, *Madonna and Child*, detail of Arezzo Polyptych, tempera, 1320, Arezzo, Pieve di S.Maria.
- 316: Pietro Lorenzetti, *Elijah's Well*, detail of Carmine Altarpiece Predella, tempera, c. 1327-8, Siena, Pinacoteca Nazionale.
- 317: Pietro Lorenzetti, *Madonna and Child with Angels*, tempera, 1340, Florence, Uffizi.
- 318: Pietro Lorenzetti, detail of Beata Umilità Altarpiece, tempera, c. 1340, Florence, Uffizi.
- 319: Pietro Lorenzetti, *Nativity of the Virgin*, tempera, 1342, Siena, Museo dell'Opera del Duomo.
- 320: Ambrogio Lorenzetti, *The Life of St. Nicholas, Resurrection of the Boy*, tempera, c. 1330-32, Florence, Uffizi.
- 321: Ambrogio Lorenzetti, *Massa Marittima Maestà*, tempera, 1335, Massa Marittima, Palazzo Comunale.
- 322: Ambrogio Lorenzetti, *Louis being Received by Boniface VIII*, fresco, c. 1326, Siena, S.Francesco.

- 323: Ambrogio Lorenzetti, *City of Good Government*, fresco, 1337-40, Siena, Palazzo Pubblico, Sala della Pace.
- 324: Ambrogio Lorenzetti, detail of *City of Good Government*, 1337-40, Siena, Palazzo Pubblico, Sala della Pace.
- 325: Division of original and repainted work on *City of Good Government*, following Brandi's report and sketch (Fig.2 p.120, in 'Chiarimenti sul Buon Governo di Ambrogio Lorenzetti', *Bollettino d'Arte*, 40, 1955, pp. 119-123).
- 326: Andrea Vanni (?), *City of Good Government*, detail of repainted section, fresco, bet.1350-1360, Siena, Palazzo Pubblico, Sala della Pace.
- 327: Andrea Vanni (?), detail of buildings from *City of Good Government*, repainted section, fresco, bet.1350-1360, Siena, Palazzo Pubblico, Sala della Pace.
- 328: Ambrogio Lorenzetti, *The Well Governed Country*, fresco, 1337-40, Siena, Palazzo Pubblico, Sala della Pace.
- 329: Ambrogio Lorenzetti, detail from *The Well Governed Country*, fresco, 1337-40 Siena, Palazzo Pubblico, Sala della Pace.
- 330: Ambrogio Lorenzetti, *The Allegory of Good Government*, fresco, 1337-40 Siena, Palazzo Pubblico, Sala della Pace.
- 331: Division of original and repainted work on *The Allegory of Good Government*, following Brandi's report and sketch (Fig.1 p.119, in 'Chiarimenti sul Buon Governo di Ambrogio Lorenzetti', *Bollettino d'Arte*, 40, 1955, pp. 119-123).
- 332: Andrea Vanni (?), *Magnanimità, Temperantia, Iustitia*, detail of *The Allegory of Good Government*, repainted section, fresco, bet.1350-1360, Siena, Palazzo Pubblico, Sala della Pace.
- 333: Ambrogio Lorenzetti, the little *Maestà*, tempera, c.1340, Siena, Pinacoteca Nazionale.
- 334: Ambrogio Lorenzetti, *Presentation in the Temple*, tempera, 1342, Siena, Museo dell'Opera del Duomo.
- 335: Sketch plan indicating local directions of light in Pl.334 above.
- 336: Ambrogio Lorenzetti, *Simon and Infant Christ*, detail of *Presentation in the Temple*, tempera, 1332, Siena, Museo dell'Opera del Duomo.
- 337: Simone Martini, *Madonna and Child*, tempera, c.1308-1310, Siena, Pinacoteca (No.583).
- 338: Simone Martini, *Maestà*, fresco, 1315, Siena, Palazzo Pubblico.
- 339: Simone Martini, *Virgin and Child*, detail of *Maestà*, fresco, 1315, Siena, Palazzo Pubblico.
- 340: Simone Martini, *SS. Louis of France & Louis of Toulouse, and SS. Clare & Elizabeth of Hungary*, fresco, c.1317, Assisi, S.Francesco, St.Martin Chapel.
- 341: Simone Martini, *The Knighting of St.Martin*, fresco, c.1317 Assisi, S.Francesco, Lower Church, St.Martin Chapel.
- 342: Simone Martini, *Musicians*, detail of *Knighting of St.Martin*, fresco, c.1317, Assisi, S.Francesco, Lower Church, St.Martin Chapel.
- 343: Simone Martini, *Dream of St.Martin*, fresco, c.1317, Assisi, S.Francesco, Lower Church, St.Martin Chapel.
- 344: Simone Martini, *St.Martin Renouncing the Sword*, fresco, c.1317, Assisi, S.Francesco, Lower Church, St.Martin Chapel.
- 345: Simone Martini, detail of *St.Martin Renouncing the Sword*, fresco, c.1317, Assisi, S.Francesco, Lower Church, St.Martin Chapel.
- 346: Simone Martini, *Burial of St.Martin*, fresco, c.1317, Assisi, S.Francesco, Lower Church, St.Martin Chapel.

- 347: Simone Martini, detail of *Burial of St. Martin*, fresco, c.1317, Assisi, S.Francesco, Lower Church, St.Martin Chapel.
- 348: Simone Martini, *Santa Caterina Altarpiece*, tempera, 1319, Pisa, Museo Nazionale.
- 349: Simone Martini (?), detail of *Guidoriccio da Fogliano*, fresco, 1330 ?, Siena, Palazzo Pubblico.
- 350: Simone Martini, *Gabriel*, detail of *Annunciation*, tempera, 1333, Florence, Uffizi.
- 351: Jacopo di Cione, *The Zecca Coronation*, tempera, 1373 Florence, Galleria dell'Accademia.
- 352: Jacopo di Cione and collaborators, *Crucifixion*, tempera, 1370's, London, National Gallery.
- 353: Jacopo di Cione, *Coronation of the Virgin*, detail of San Pier Maggiore Altarpiece, tempera, 1370-71, London, National Gallery.
- 354: Jacopo di Cione, *Saints*, detail of San Pier Maggiore Altarpiece, tempera, 1370-71, London, National Gallery.
- 355: Jacopo di Cione, *St.Stephen*, detail from San Pier Maggiore Altarpiece, tempera, c.1370, London, National Gallery.
- 356: Jacopo di Cione, *The Three Marys at the Tomb*, San Pier Maggiore Altarpiece, tempera, c.1370, London National Gallery.
- 357: Jacopo di Cione, *Nativity and Annunciation to the Shepherds*, detail of San Pier Maggiore Altarpiece, tempera, 1370-71, London, National Gallery
- 358: Jacopo di Cione, *Adoration of the Magi*, detail of San Pier Maggiore Altarpiece, tempera, 1370-71, London, National Gallery.
- 359: Guariento, *Judith and Holofernes*, fresco, c.1350, Padua, Accademia Patavina.
- 360: Guariento, *St.Augustine Receiving the Habit and His Baptism*, fresco, c.1366-70, Padua, Church of the Eremitani.
- 361: Guariento, *Coronation of the Virgin*, fresco, c. 1351, Padua, Church of the Eremitani.
- 362: Altichiero, *Coronation of the Virgin*, fresco, c 1380, Padua, Church of the Eremitani. (Destroyed 1944).
- 363: Altichiero, *Soldiers*, detail of *Crucifixion*, fresco, 1377-1379, Padua, Il Santo, Capella di S.Giacomo.
- 364: Altichiero, *Mary and Attendant Crowd*, detail of *Crucifixion*, fresco, 1377-1379, Padua, Il Santo, Capella di San Giacomo.
- 365: Altichiero, detail of *Funeral of St.Lucy*, fresco, 1379-84, Padua, Oratorio di S.Giorgio.
- 366: Altichiero, *Bystanders* detail of *Torture of St George*, fresco, 1379-84, Padua, Oratorio di S.Giorgio.
- 367: Altichiero, *Bystanders* detail of *Torture of St George*, fresco, 1379-84 Padua, Oratorio di S.Giorgio.
- 368: Altichiero, *Soldiers*, detail of *Crucifixion*, fresco, 1379-84, Padua, Oratorio di S.Giorgio.
- 369: Altichiero, *Presentation in the Temple*, fresco, 1379-84, Padua, Oratorio di San Giorgio.
- 370: Altichiero, *Coronation of the Virgin*, fresco, 1379-84, Padua, Oratorio di San Giorgio.
- 371: Altichiero, *Martyrdom of St.George*, fresco, 1379-84, Padua, Oratorio di S.Giorgio.
- 372: Altichiero, Window shadows, background detail of *St.Lucy before Judge Pascasio*, fresco, 1379-84, Padua, Oratorio di S.Giorgio.

- 373: Altichiero, *St. George Baptising King Sevio and his Court*, fresco, 1379-84
Padua, Oratorio di S. Giorgio.
- 374: Avanzi, *Miraculous Burial of St. James; Queen Lupa told of the Miracle*, fresco,
bet. 1377-1379, Padua, Il Santo, Capella di S. Giacomo.
- 375: Avanzi, *St. James Disputing with Filetus*, fresco, bet. 1377-1379,
Padua, Il Santo, Capella di San Giacomo.
- 376: Marino Sanuto, *Map of the World*, c. 1306-21, Paris, Bibliothèque Nationale.
- 377: Giusto de' Menabuoi, *Creation of the World*, fresco, 1370's,
Padua, Duomo Baptistery
- 378: Giusto de' Menabuoi, *Adoration of the Magi*, fresco, 1370's,
Padua, Duomo Baptistery.
- 379: Giusto de' Menabuoi, *The Calling of St. Matthew*, fresco, mid 1370's,
Padua, Duomo Baptistery.
- 380: Giusto de' Menabuoi, *Annunciation*, fresco. Mid 1370's,
Padua, Duomo Baptistery.
- 381: Giusto de' Menabuoi, *Christ Among the Doctors*, fresco, mid 1370's
Padua Duomo Baptistery.
- 382: Giusto de' Menabuoi, *Presentation of the Virgin*, mid 1370's,
Padua, Duomo Baptistery.
- 383: Giusto de' Menabuoi, *Arrest of Christ*, fresco, mid 1370's,
Padua, Duomo Baptistery.
- 384: Tomaso da Modena, *Albertus Magnus and Johann di Sassonia*,
fresco, 1351-52, Treviso, S. Nicolò, Capitolo.
- 385: Tomaso da Modena, *St. Jerome*, fresco, 1350's,
Treviso, S. Nicolò.
- 386: Tomaso da Modena, *Ink bottle and quill box shadows*, detail of *St. Jerome*,
fresco, 1350's, Treviso, S. Nicolò.
- 387: Bottega di S. Francesco, Maestro di Feltre (?), *St. Anthony Abbot*, fresco,
c. 1350's, Treviso, S. Francesco, Cappella Coletti.
- 388: Vitale da Bologna, detail of *Coronation of the Virgin*, tempera, c. 1350,
Bologna, Pinacoteca Nazionale.
- 389: Agnolo Gaddi, *Presentation of the Virgin*, fresco, c. 1380's, Prato, Duomo.
- 390: Agnolo Gaddi, *Discovery and Testing of the True Cross*, fresco, c. 1380,
Florence, Santa Croce.
- 391: Agnolo Gaddi, *Coronation of the Virgin*, tempera, c. 1380,
London National Gallery.
- 392: Agnolo Gaddi, *Coronation of the Virgin*, tempera, c. 1388-93,
Washington, National Gallery.
- 393: Niccolò di Pietro Gerini, *Baptism of Christ, with SS Peter and Paul*,
tempera, 1387, London National Gallery.
- 394: Spinello Aretino, *St. Benedict receives King Totila*, fresco, 1385-87
Florence, San Miniato al Monte, Sacristy.
- 395: Spinello Aretino *Madonna and Child Enthroned with Two Saints*, fresco
c. 1390's, Arezzo, Duomo.
- 396: Spinello Aretino & Parri di Spinello, detail of *Life of Alexander III*,
fresco, 1407-08, Siena, Palazzo Pubblico, Sala di Balìa.
- 397: Paolo di Giovanni Fei, *Nativity of the Virgin with Saints*, tempera, 1390-1400,
Siena, Pinacoteca.
- 398: Gentile da Fabriano, *Stigmatisation of St. Francis*, tempera, c. 1400-1410,
Traversetolo (Parma), Fondazione Magnani.

- 399: Gentile da Fabriano, *Adoration of the Magi Altarpiece*, tempera, 1423, Florence, Uffizi.
- 400: Gentile da Fabriano, *Nativity*, Predella of the *Adoration of the Magi Altarpiece*, tempera, 1423, Florence, Uffizi.
- 401: Gentile da Fabriano, *Flight into Egypt*, Predella of the *Adoration of the Magi Altarpiece*, tempera, 1423, Florence, Uffizi.
- 402: Gentile da Fabriano, *Presentation in the Temple*, Predella of the *Adoration of the Magi Altarpiece*, tempera, 1423, Paris, Louvre.
- 403: Masaccio, *San Giovenale Triptych*, tempera, 1422, Cascia de Reggello, S.Pietro.
- 404: Masaccio, *Madonna and Child with St. Anne*, tempera, c.1424-25, Florence, Uffizi.
- 405: Masaccio, detail of *Madonna and Child with St. Anne*, tempera, c.1424-25, Florence, Uffizi.
- 406: Masaccio, *The Tribute Money*, fresco, c.1425, Florence, Sta Maria del Carmine, Brancacci Chapel.
- 407: Masaccio, detail of *The Tribute Money*, fresco, c.1425, Florence, Sta. Maria del Carmine, Brancacci Chapel.
- 408: Masaccio, *St. Peter Healing the Sick by his Shadow*, fresco, c.1426, Florence, Sta. Maria del Carmine, Brancacci Chapel.
- 409: Masaccio, *Enthroned Madonna with Child and Angels*, centre panel of the Pisa Polyptych, tempera, 1426, London, National Gallery.
- 410: Masaccio, *Martyrdom of St. John the Baptist*, detail from the predella of the Pisa Polyptych, tempera, 1426, Berlin, Staatliche Museum.
- 411: Fra Angelico, *Virgin and Child Enthroned with Eight Angels*, centre panel of altarpiece, tempera, c.1425, Fiesole, S.Domenico
- 412: Robert Campin, *A Woman*, c.1430, London, National Gallery.
- 413: Jan van Eyck, *Cardinal Niccolò Albergati / Bishop of Winchester*, 1432, Vienna, Kunsthistorisches Museum.
- 414: Jan van Eyck, *The Arnolfini Wedding*, 1434, London, National Gallery.
- 415: Jan van Eyck, *Mirror*, detail of *The Arnolfini Wedding*, 1434, London, National Gallery.
- 416: Jan van Eyck, *Jan Arnolfini*, detail of *The Arnolfini Wedding*, 1434, London, National Gallery.
- 417: Jan van Eyck, *Giovanna Arnolfini*, detail of *The Arnolfini Wedding*, 1434, London, National Gallery.
- 418: Filippo Lippi, detail of the *Tarquinia Madonna*, 1437, Rome Palazzo Barberini.
- 419: Sassetta, *Stigmatisation of St Francis*, tempera, 1437-44, London, National Gallery.



Plate 213: Giotto, *Enthroned Madonna*, tempera, c. 1295,
Florence, S. Giorgio alla Costa.



Plate 214: Giotto, *Ognissanti Madonna*, tempera, c.1310-15, Florence, Uffizi.

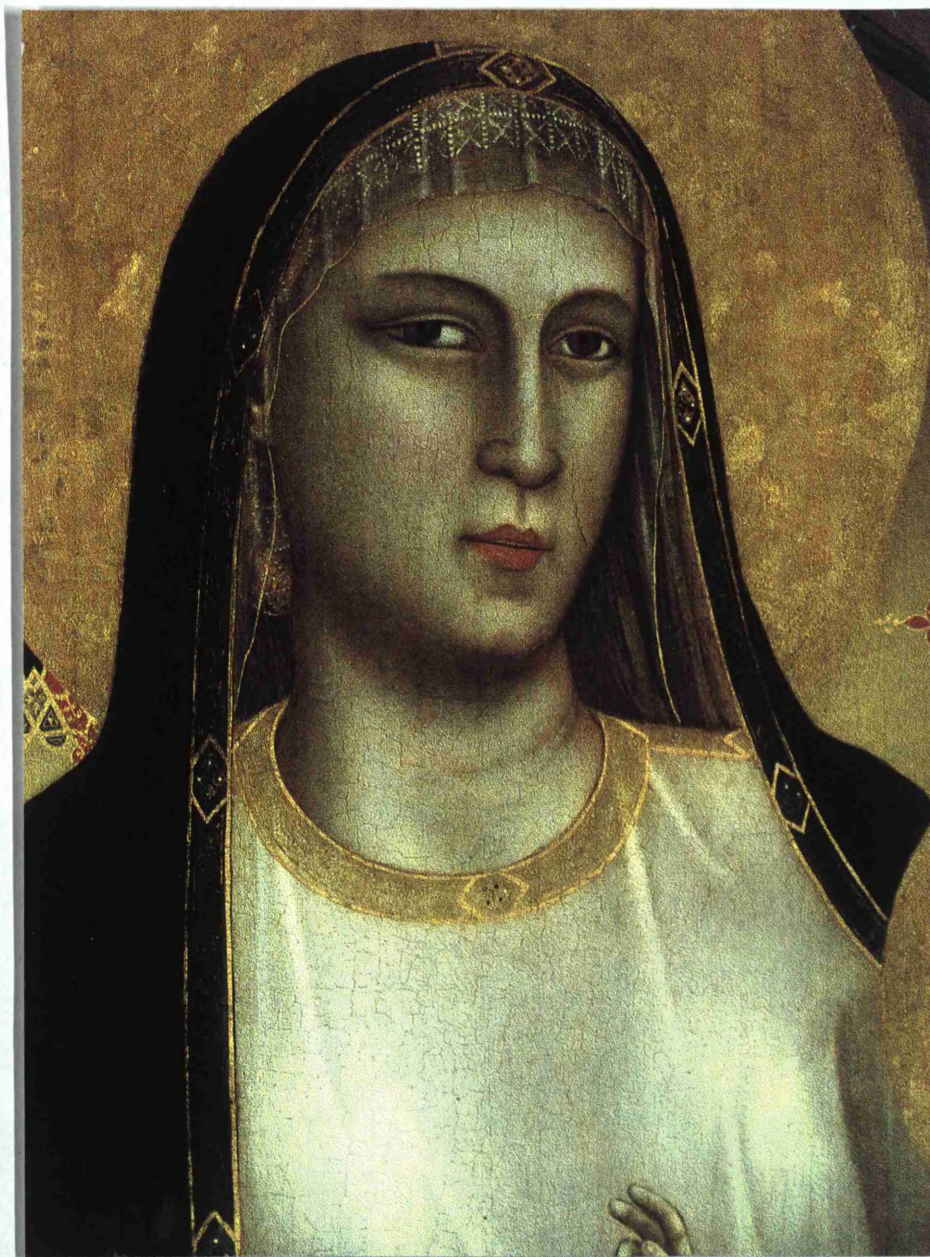


Plate 215: Giotto, detail of *Ognissanti Madonna*, tempera, c. 1310-15, Florence, Uffizi.



Plate 216: Giotto, *Joachim*, detail of *Joachim's Expulsion from the Temple*, fresco, bet. 1304-1314, Padua, Arena Chapel.



Plate 217: Giotto, *Joachim's Dream*, fresco, bet. 1304-1314,
Padua, Arena Chapel.



Plate 219: Giotto, *Birth of the Virgin*, fresco, bet. 1304-1314,
Padua, Arena Chapel.



Plate 220: Giotto, *Presentation of The Virgin*, bet. 1304-1314,
Padua, Arena Chapel.

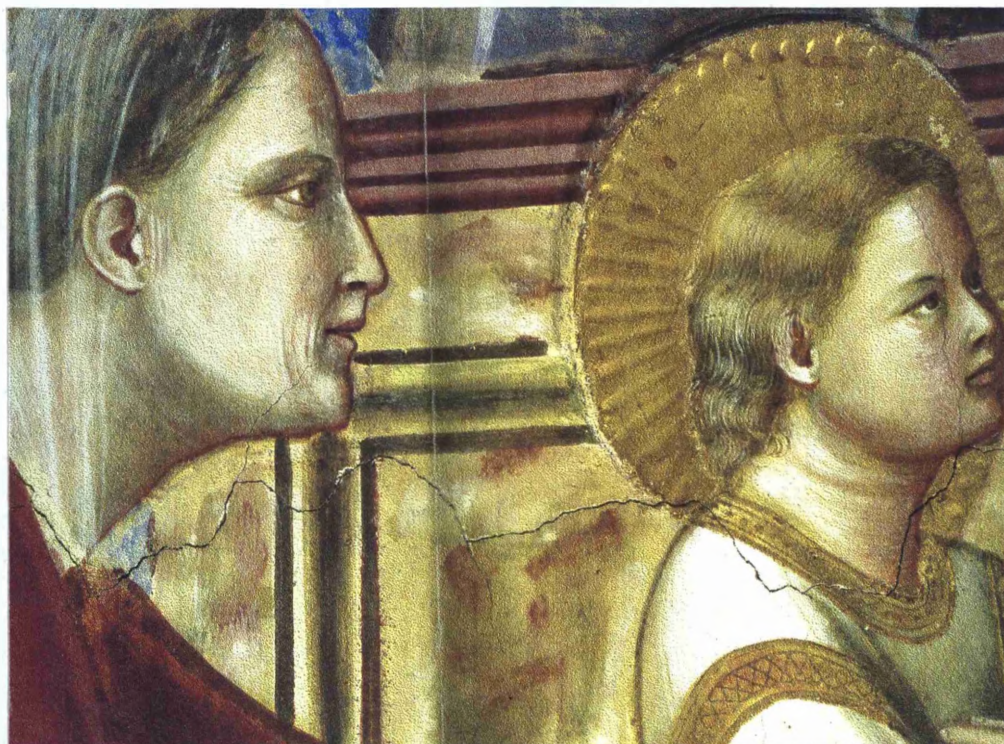


Plate 221: Giotto, *St Anne and Mary*, detail of *Presentation of The Virgin*,
bet. 1304-1314, Padua, Arena Chapel.



Plate 222: Giotto, *Prayer for the Flowering of the Branches*, fresco, bet.1304-1314, Padua Arena Chapel.



Plate 223: Giotto, *Flight into Egypt*, fresco,
bet. 1304-1314, Padua, Arena Chapel.



Plate 224: Giotto, *The Wedding at Cana*, fresco, bet.1304-1314,
Padua, Arena Chapel.

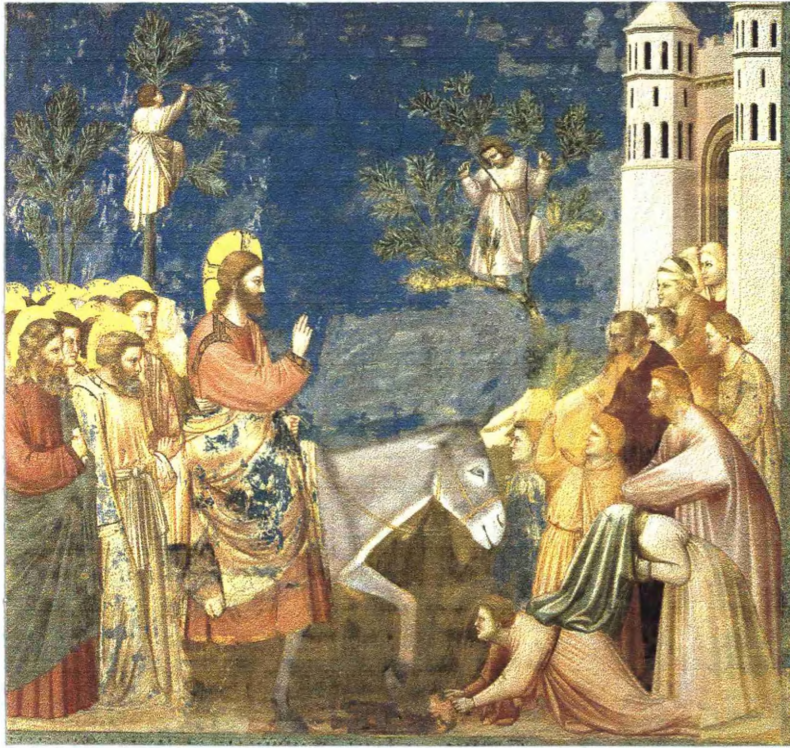


Plate 225: Giotto, *Entry to Jerusalem*, fresco, bet. 1304-1314, Padua, Arena Chapel.



Plate 226: Giotto, *The Last Supper*, fresco, bet. 1304-1314, Padua, Arena Chapel.

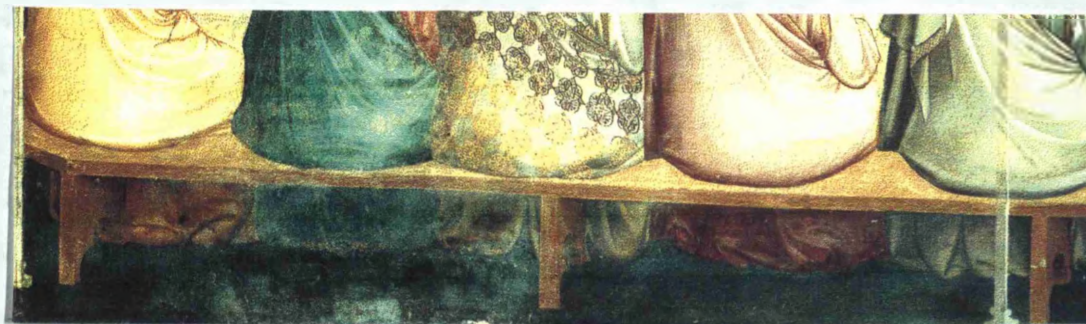


Plate 227: Giotto, *Bench*, detail of *The Last Supper*, fresco, bet. 1304-1314, Padua, Arena Chapel.

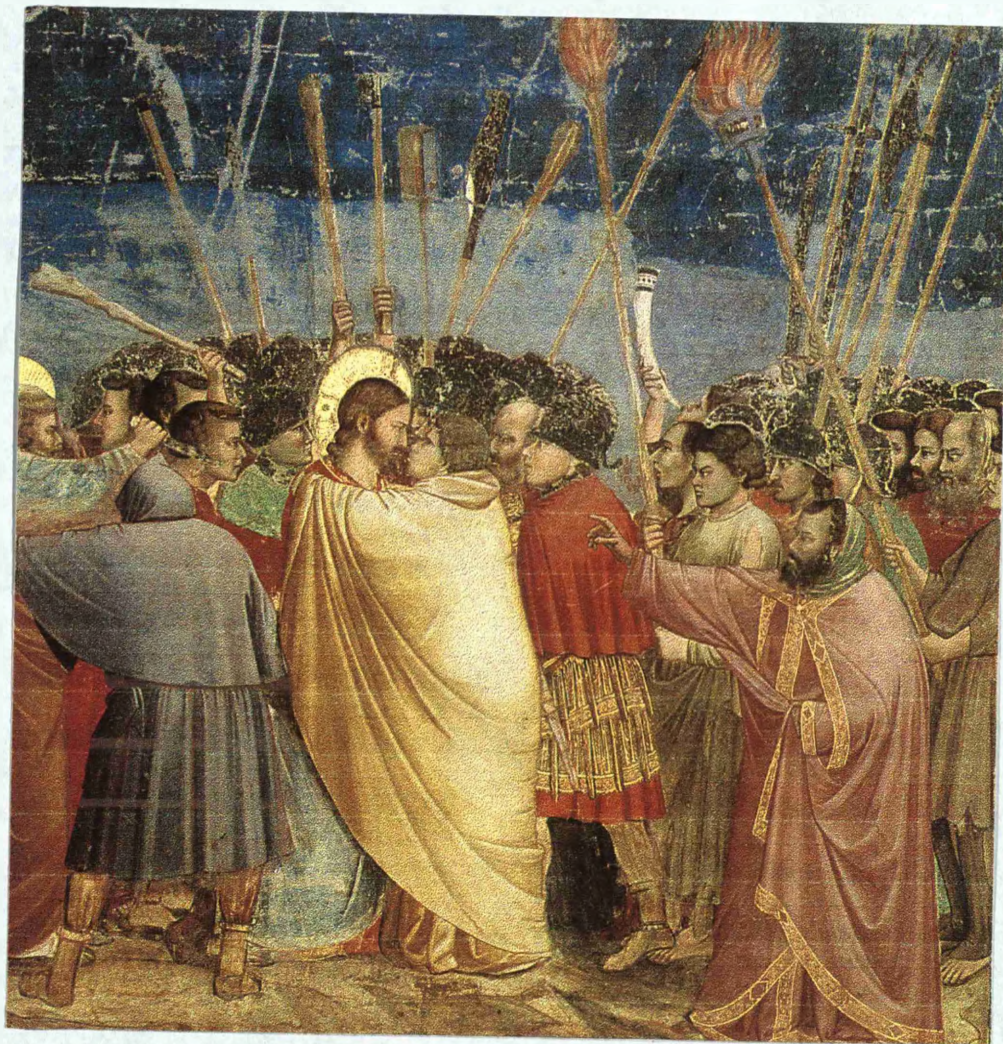


Plate 228: Giotto, *Arrest of Christ*, fresco, bet. 1304-1314,
Padua, Arena Chapel.



Plate 229: Giotto, detail of *Arrest of Christ*, fresco, bet. 1304-1314,
Padua, Arena Chapel.

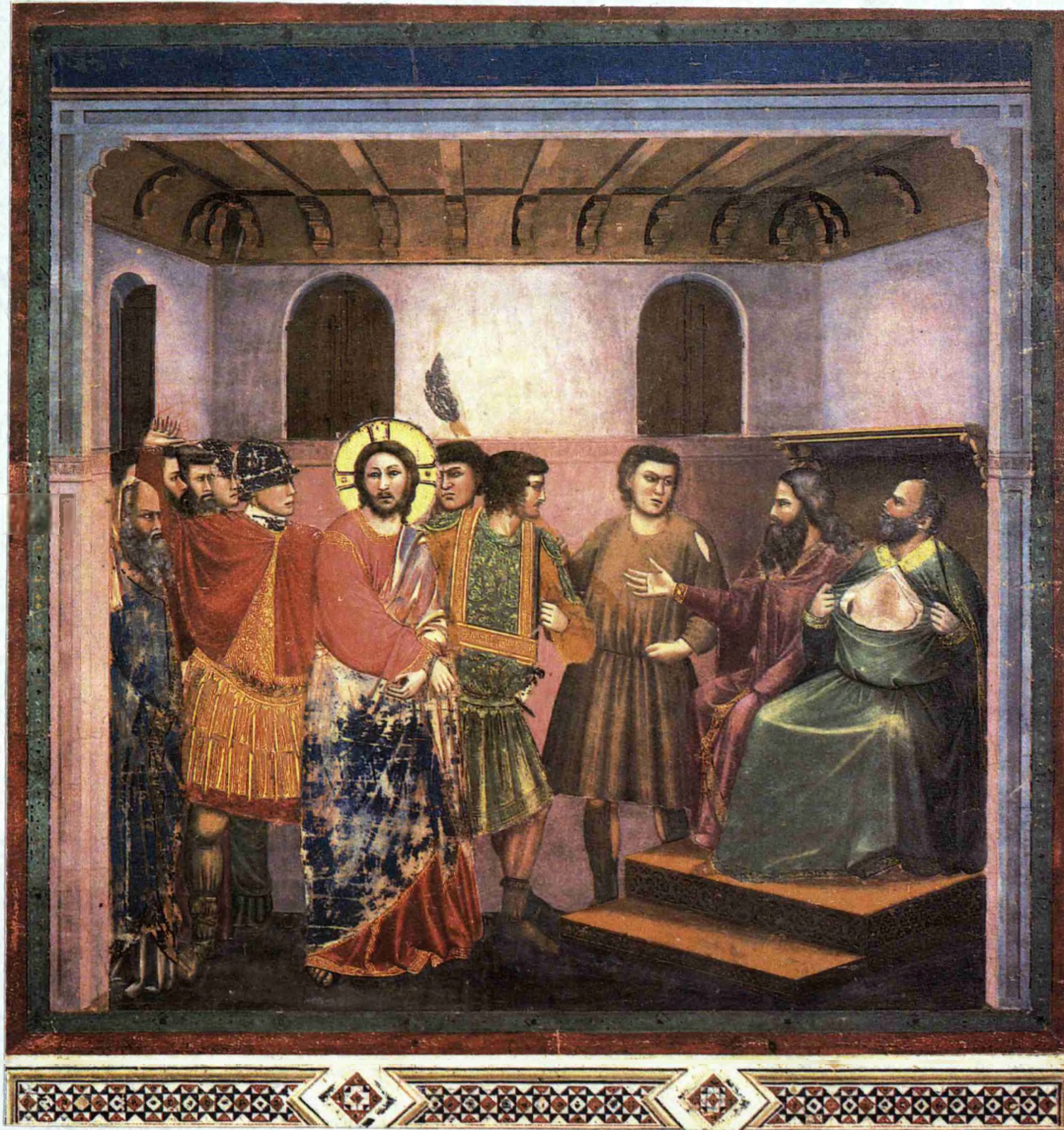


Plate 230: Giotto, *Jesus Before Caiaphas*, fresco, bet. 1304-1314,
Padua, Arena Chapel

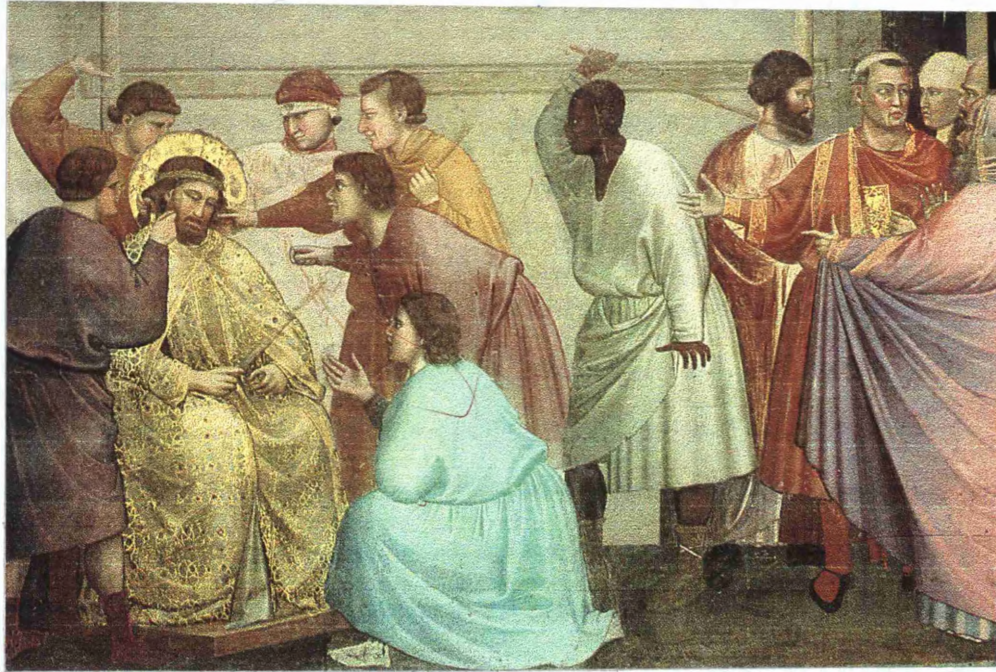


Plate 231: Giotto, *Mocking of Christ*, fresco, bet. 1304-1314,
Padua, Arena Chapel.



Plate 232: Giotto, *Pilate*, detail of *Mocking of Christ*, fresco, bet. 1304-1314, Padua, Arena Chapel.



Plate 233: Giotto, *Christ*, detail of *Road to Calvary*, fresco, bet.1304-1314, Padua, Arena Chapel.



Plate 234: Giotto, *The Lamentation*, fresco, bet. 1304-1314,
Padua, Arena Chapel.



Plate 235: Giotto, *Noli Me Tangere*, fresco, bet.1304-1314,
Padua, Arena Chapel.



Plate 236: Giotto, *God Eternal*, tempera, panel set in fresco, bet.1304-1313, Padua, Arena Chapel.



Plate 237: Giotto Workshop, *Stigmatisation of St. Francis*,
tempera, c.1300. Paris, Louvre.



Plate 238: Giotto Workshop, *Visitation*, fresco, bet 1310-17,
Assisi, S.Francesco, Lower Church.



Plate 239: Giotto Workshop, *Massacre of the Innocents*, fresco, bet.1310-17, Assisi, S.Francesco, Lower Church.



Plate 240: Giotto Workshop, detail of *Massacre of the Innocents*, fresco, bet 1310-17, Assisi, S.Francesco, Lower Church.

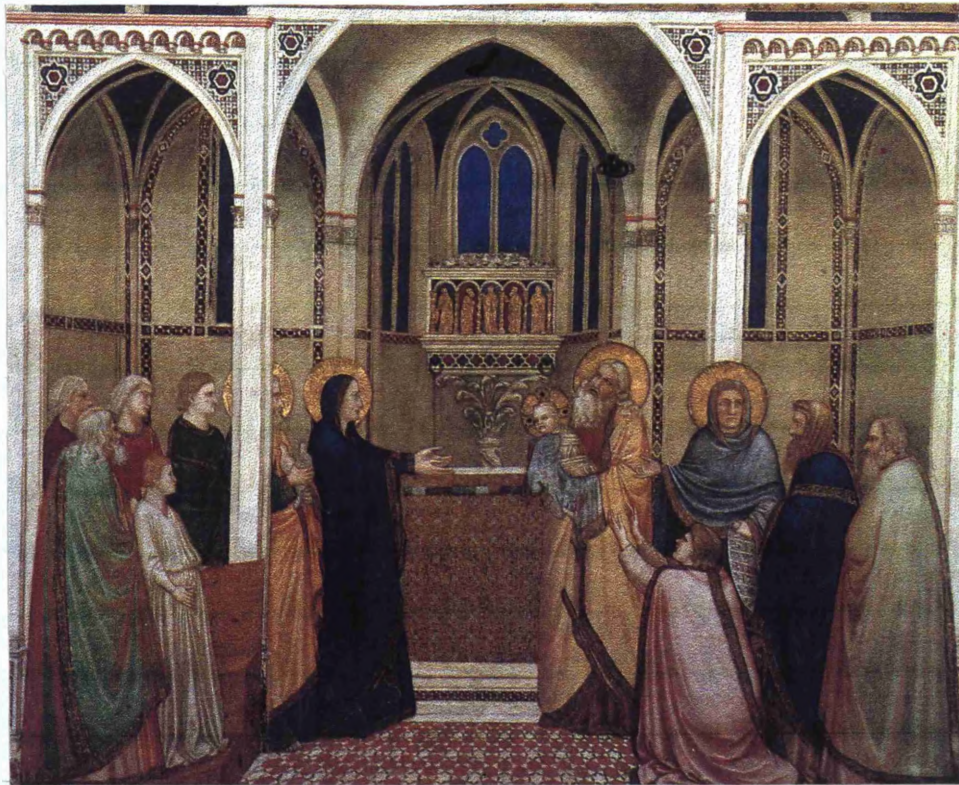


Plate 241: Giotto Workshop, *Presentation in the Temple*, fresco, bet.1310-17, Assisi, S.Francesco, Lower Church.

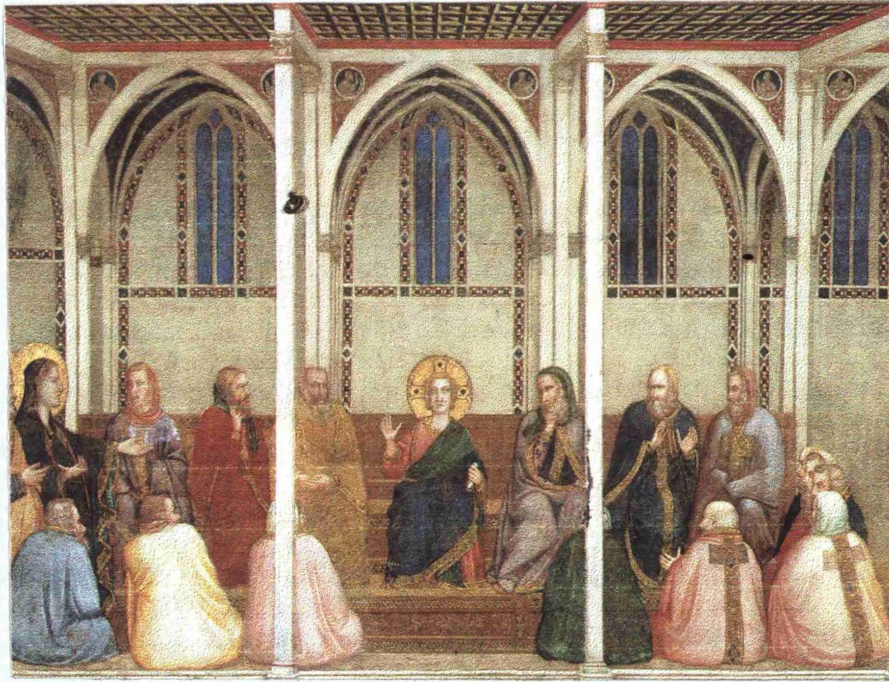


Plate 242: Giotto Workshop, *Jesus Disputing with the Doctors*, fresco, bet 1310-17, Assisi, S.Francesco, Lower Church.

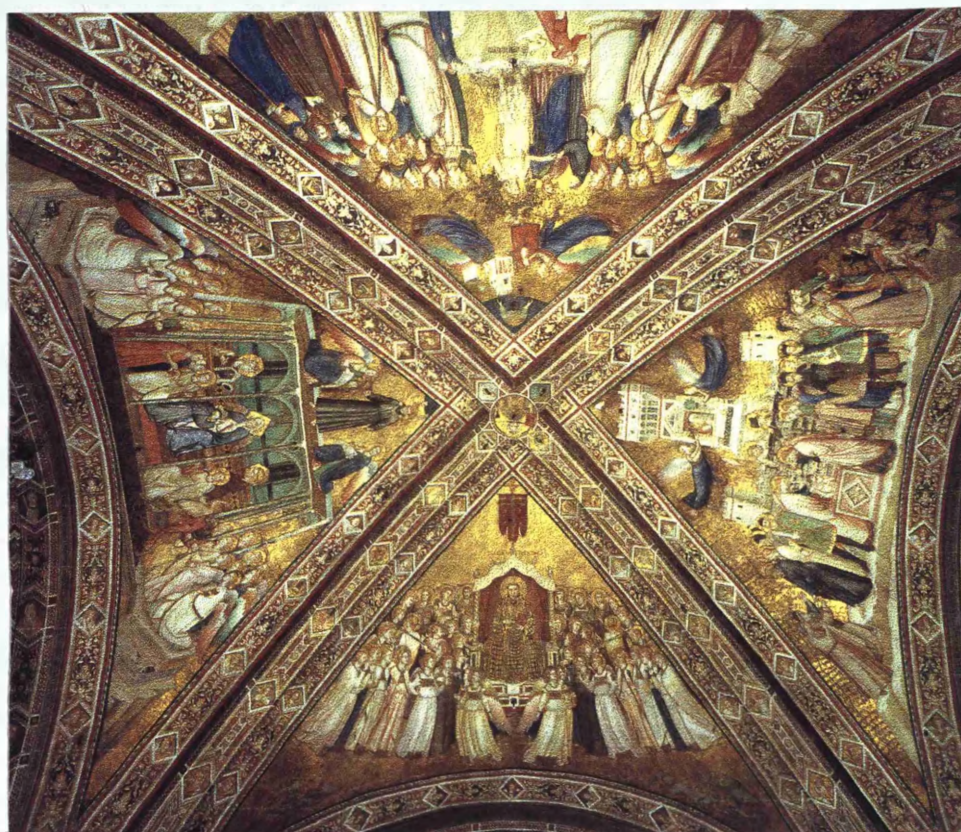


Plate 243: Giotto Workshop, *Apotheosis of St. Francis and Franciscan Allegories*, fresco, bet. 1310-17, Assisi, S. Francesco, Lower Church, Crossing Vault.

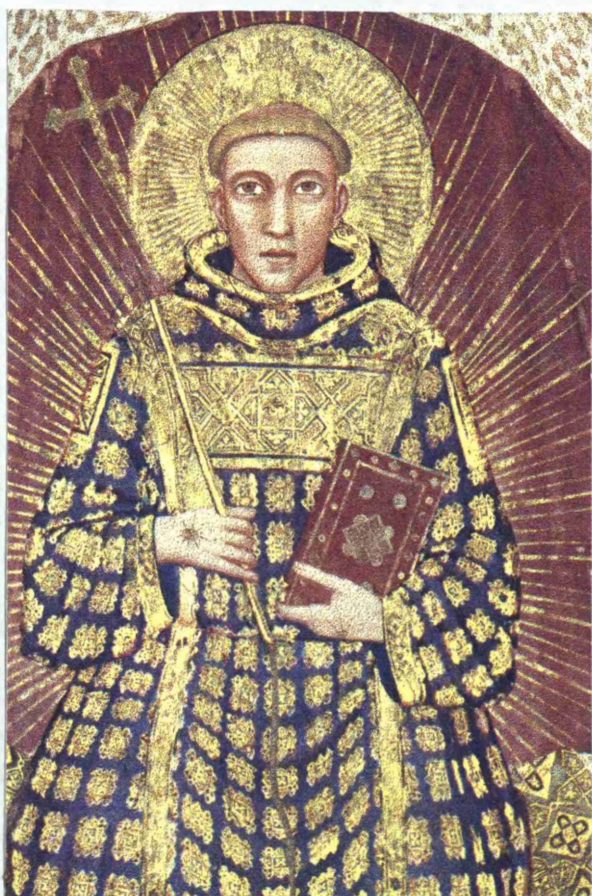


Plate 244: Giotto Workshop, *St. Francis*, detail of *Apotheosis of St. Francis*, fresco, bet. 1310-17, Assisi, S. Francesco, Lower Church, Crossing Vault.

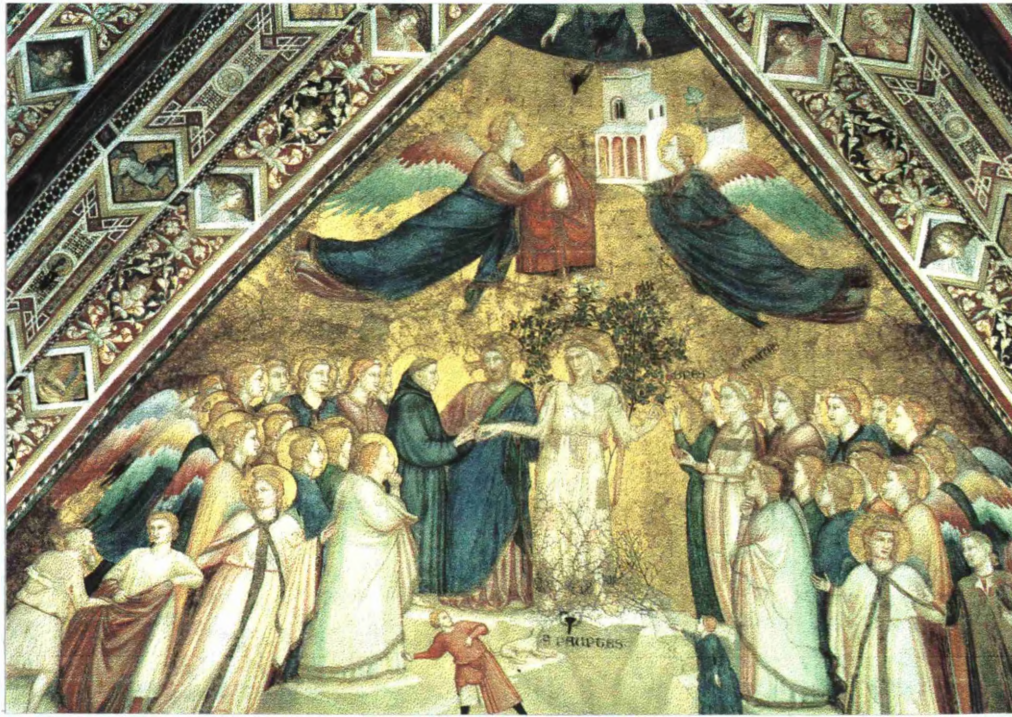


Plate 245: Giotto Workshop, *Allegory of Poverty*, fresco, bet. 1310-17, Assisi, S.Francesco, Lower Church, Crossing Vault.



Plate 247: Giotto Workshop, *Martyrdom of St. Peter*,
detail from *Stefaneschi Altarpiece*,
tempera, bet. 1318-1320, Rome, Vatican Pinacoteca.



Plate 248: Giotto Workshop, *Stigmatisation of St. Francis*, fresco, c.1325, Florence, S.Croce, Bardi Chapel Facia.

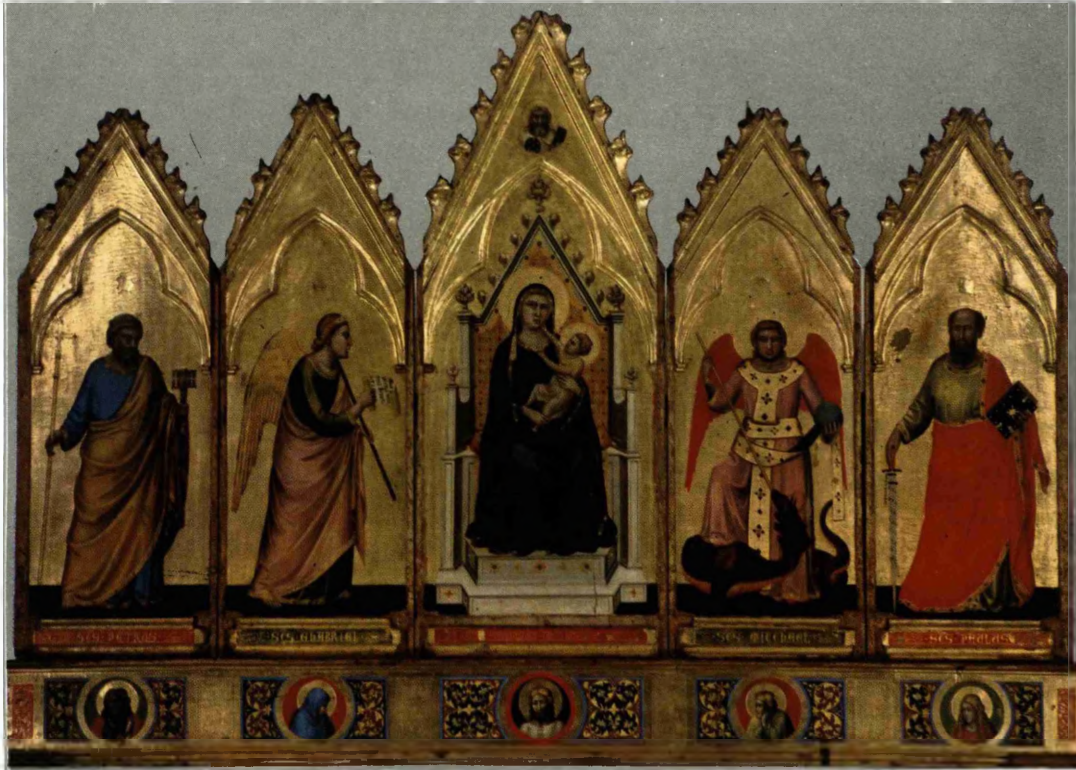


Plate 249: Giotto Workshop,
Virgin and Child with SS. Peter and Paul and Archangels Gabriel and Michael,
tempera, c.1328, Bologna, Pinacoteca Nazionale.



Plate 250: Giotto Workshop, *Coronation of the Virgin*, tempera, c.1330,
Florence, S.Croce, Baroncelli Chapel.



Plate 251: Giotto, *The Resurrection of Drusiana*, fresco, mid 1320's,
Florence, S.Croce, Peruzzi Chapel.

Original in Colour



Plate 252: Bernardo Daddi, *Virgin and Child with Angels*, tempera, 1347, Florence, Orsanmichele.

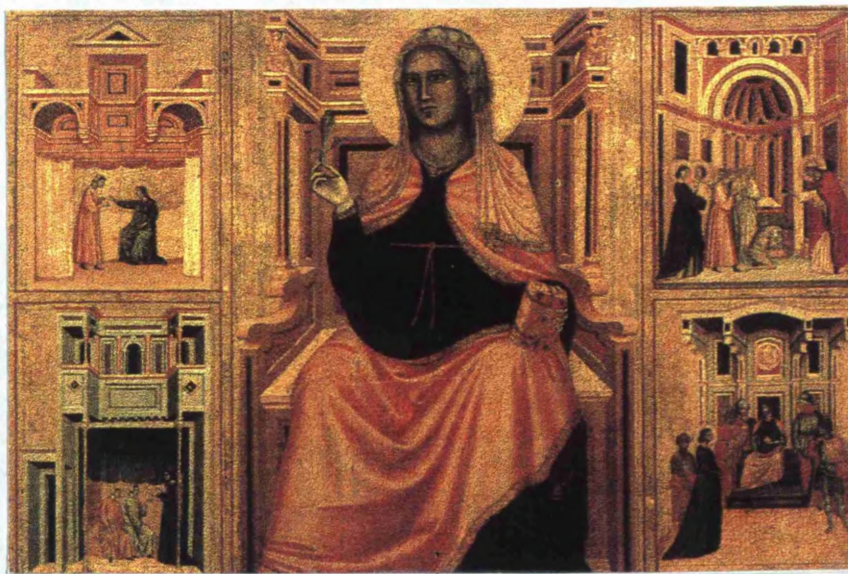


Plate 253: S.Cecilia Master, detail from *Saint Cecilia and Eight Stories from her Life*, tempera, c.1304, Florence, Uffizi.



Plate 254: *Christ*, fresco, c.1315,
Assisi, S.Francesco, Lower Church, North Transept.

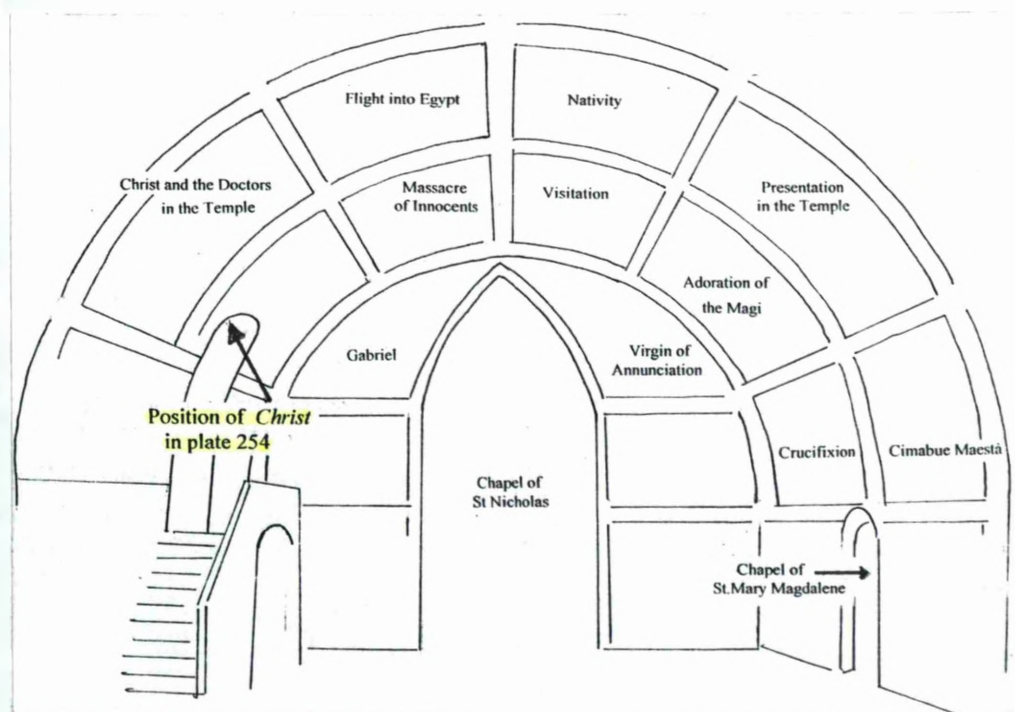


Plate 255: *North Transept of Lower Church of S.Francesco, Assisi.*
Location sketch showing position of *Christ* in Pl.254 above.



Plate 256: Maso di Banco, *St. Sylvester and the Dragon*, fresco, late 1330's, Florence, S. Croce, Bardi di Vernio Chapel.



Plate 257: Taddeo Gaddi, *Castelfiorentino Madonna*, tempera, c.1320-25,
Castelfiorentino, Museo S. Verdiana.



Plate 258: General View of Baroncelli Chapel, Florence, S.Croce.

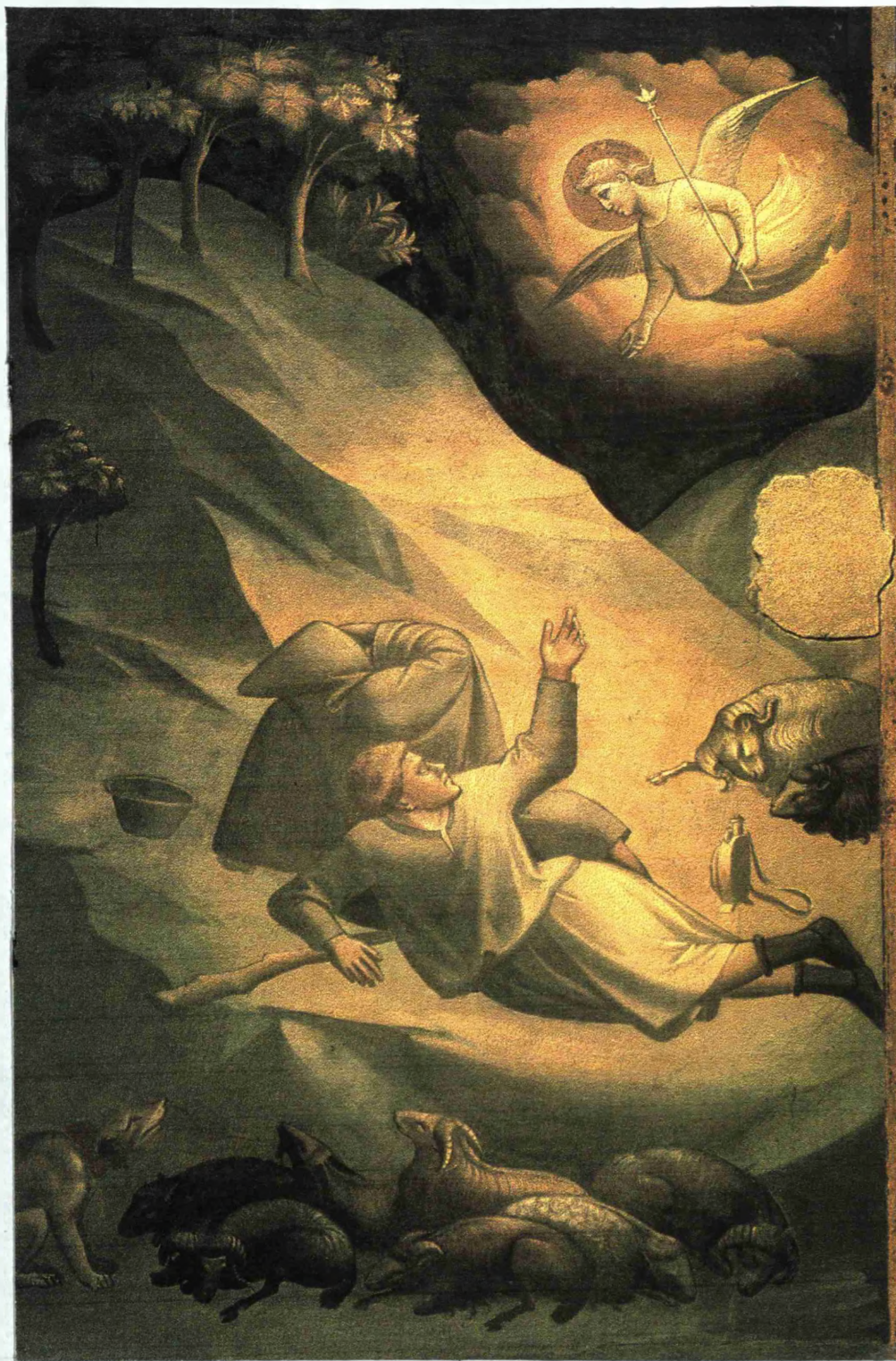


Plate 259: Taddeo Gaddi, *Annunciation to the Shepherds*, fresco, c.1328, Florence, S.Croce, Baroncelli Chapel.



Plate 260: Taddeo Gaddi, *Water Bottle and Shadow*,
detail from *Annunciation to The Shepherds*,
fresco, c.1328, Florence, S.Croce, Baroncelli Chapel.

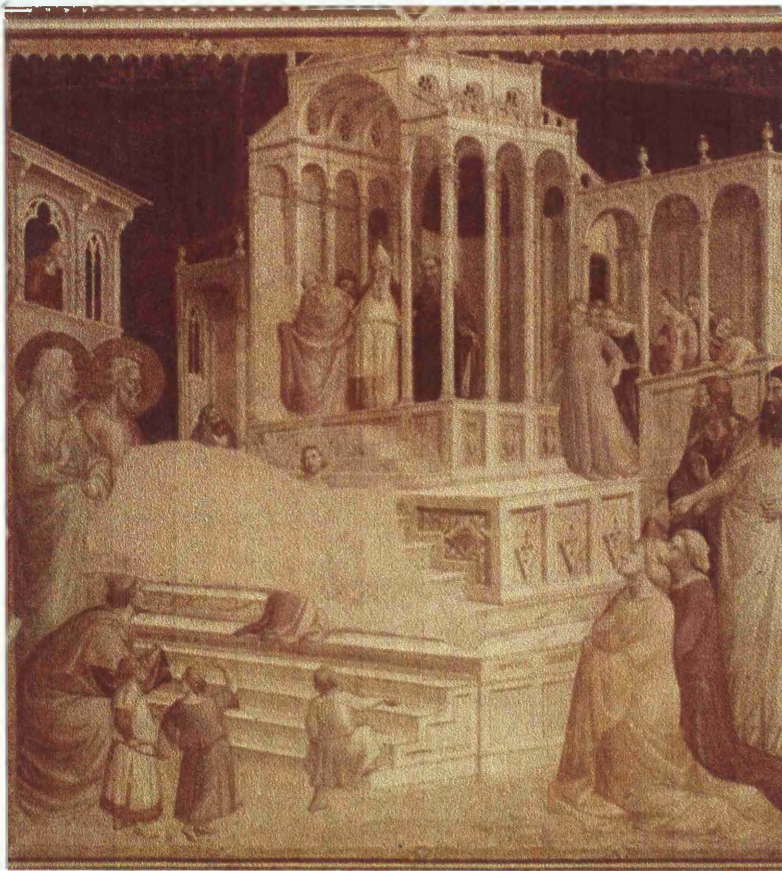


Plate 261: Taddeo Gaddi, *Presentation of the Virgin*, fresco, c.1328, Florence, S.Croce, Baroncelli Chapel.

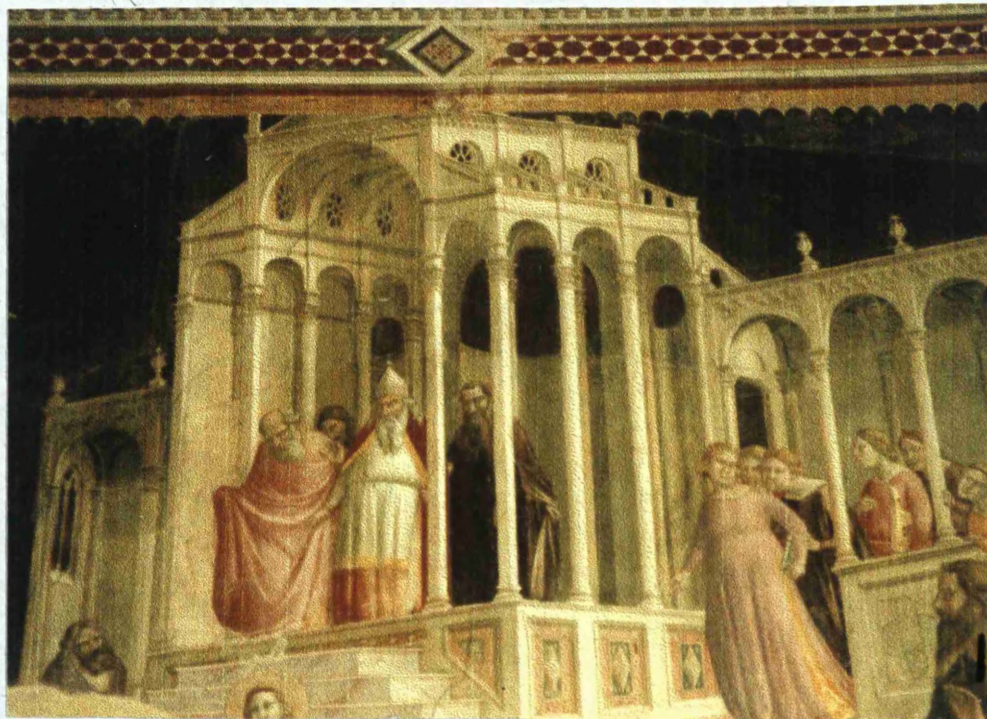


Plate 262: Taddeo Gaddi, detail of *The Virgin's Presentation*, fresco, c.1328, Florence, S.Croce, Baroncelli Chapel.



Plate 263: Taddeo Gaddi, *Theological Virtue, Prudence*, fresco, c.1328, Florence, S.Croce, Baroncelli Chapel.



Plate 264: Taddeo Gaddi, *The Meeting at the Golden Gate*, fresco, c.1328, Florence, S.Croce, Baroncelli Chapel.



Plate 265: Giovanni da Milano, *The Meeting at the Golden Gate*, fresco, c.1365-69, Florence, S.Croce, Rinuccini Chapel.

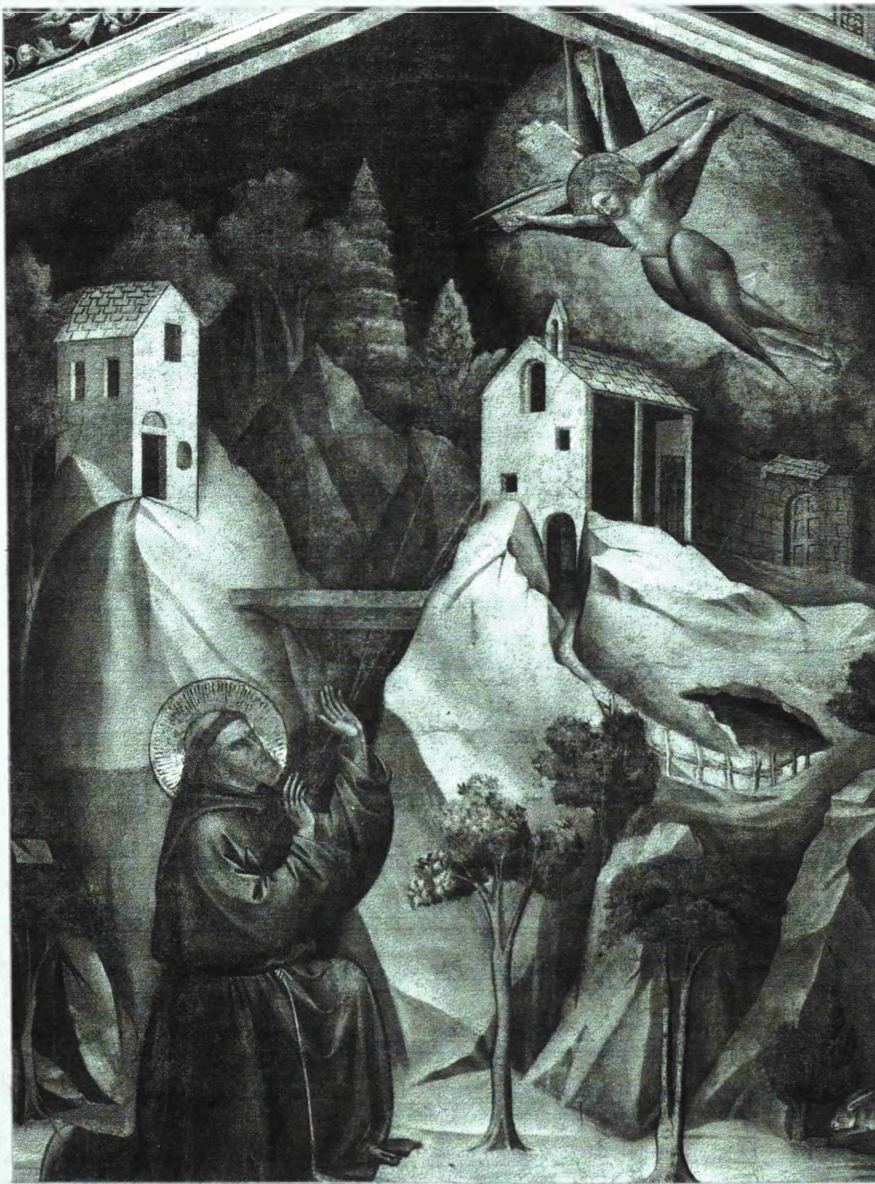


Plate 266: Taddeo Gaddi or Workshop, *Stigmatisation of St. Francis*, c.1340-50, fresco, Florence, S.Croce Refectory.

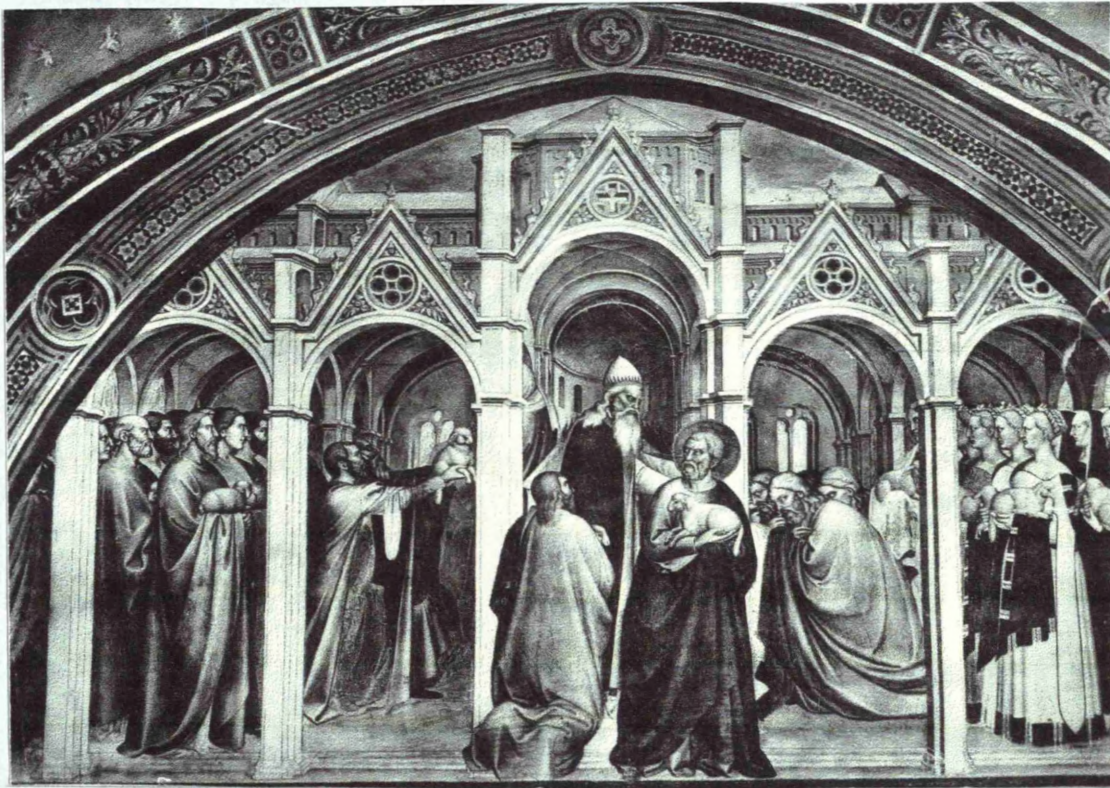


Plate 267: Giovanni da Milano, *Expulsion of Joachim*, fresco, c.1365-69,
Florence, S.Croce Rinuccini Chapel.



Plate 268: Duccio, *Crevole Madonna*, tempera, c.1280,
Siena, Museo dell'Opera del Duomo

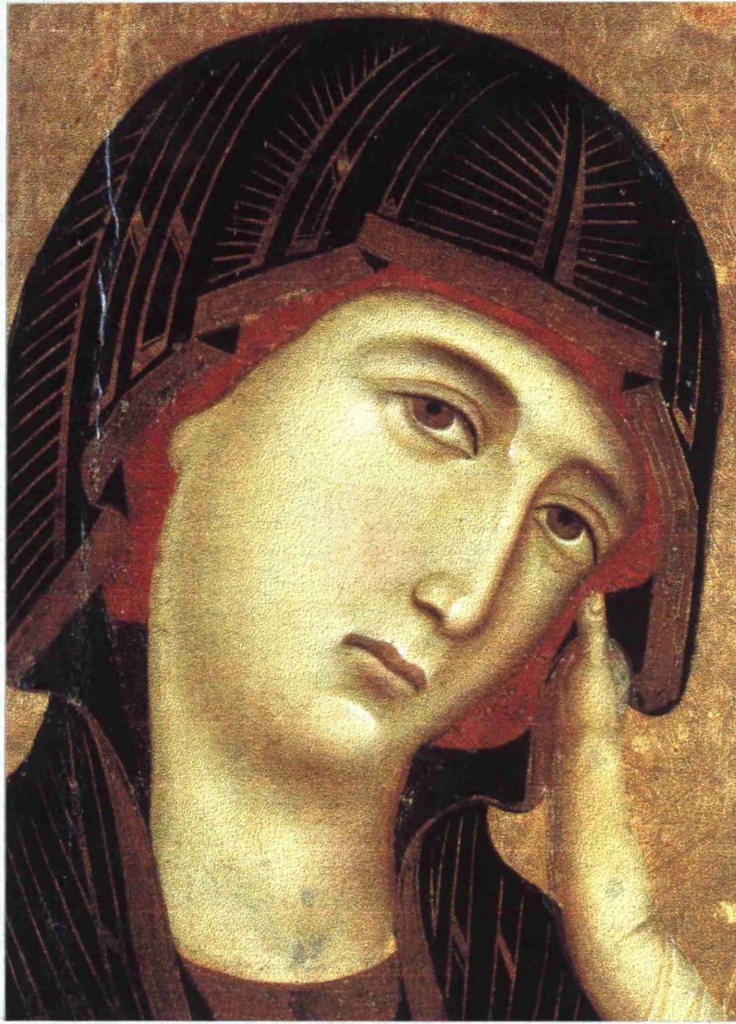


Plate 269: Duccio, detail of *Crevole Madonna*, tempera, c.1280,
Siena, Museo dell'Opera del Duomo.



Plate 270: Duccio, *Rucellai Madonna*, tempera c.1285,
Florence, Uffizi.



Plate 271: Duccio, detail of *Rucellai Madonna*, tempera, c.1285, Florence, Uffizi.



Plate 272: Duccio, detail of *Rucellai Madonna*, tempera, c.1285, Florence, Uffizi.



Plate 273: Duccio, *Madonna of the Franciscans*, tempera, c.1290, Siena, Museo dell'Opera del Duomo.

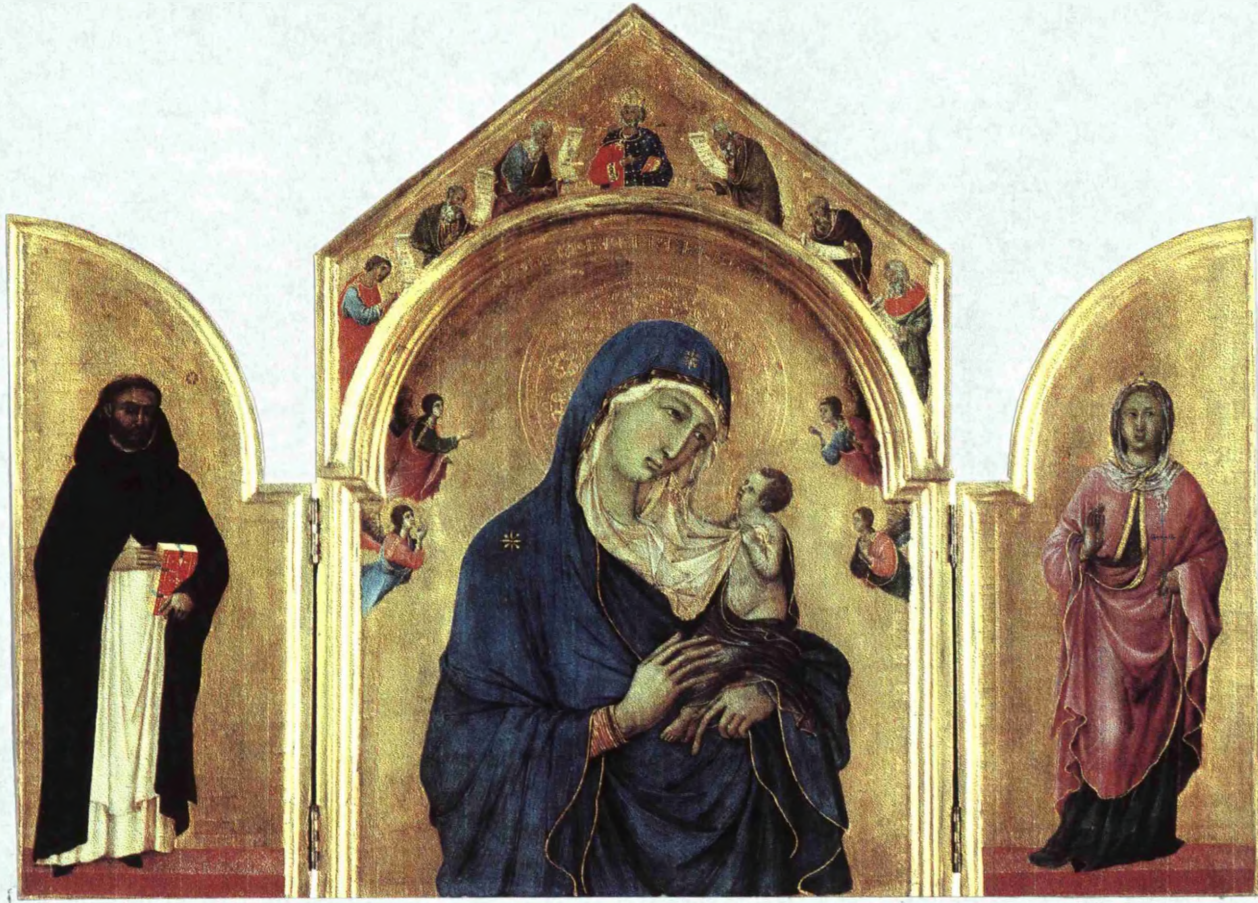


Plate 274: Duccio *Triptych, Virgin and Child with SS. Dominic and Aurea*, tempera. c.1300, London, National Gallery.



Plate 275: Duccio, *Polyptych No.28*, tempera, c.1305, Siena, Pinacoteca.



Plate 276: Duccio, *Maestà*, tempera, 1308-11,
Siena, Museo dell'Opera del Duomo.



Plate 277: Duccio, *Madonna and Child*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.



Plate 278: Duccio, *St. Catherine*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.



Plate 279: Duccio, *St. Agnes*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.



Plate 280: Duccio, *Annunciation of the Virgin's Death*, detail of *Maestà*, 1308-11, Siena, Museo dell'Opera del Duomo.



Plate 281: Duccio, *Gabriel*, detail of *Annunciation of the Virgin's Death*, *Maestà*, tempera, 1308-1311, Siena, Museo dell'Opera del Duomo.

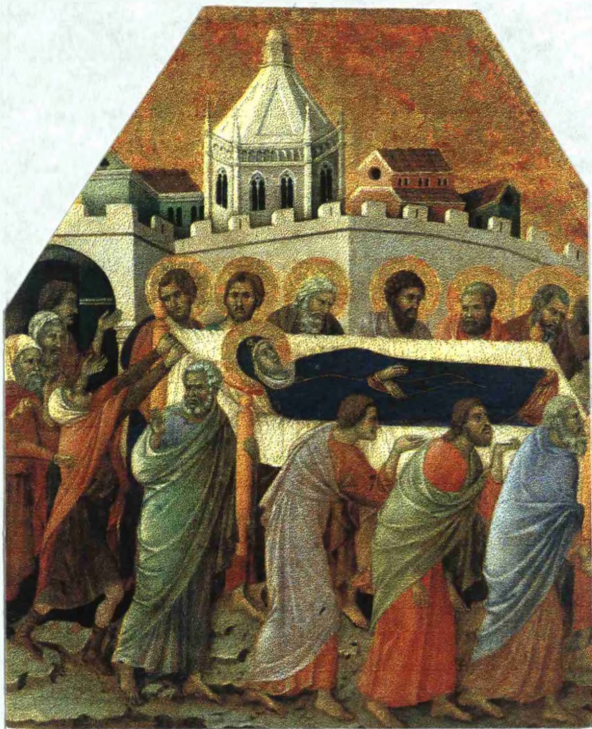


Plate 282: Duccio,
Funeral of the Virgin,
detail of *Maestà*,
tempera, 1308-11,
Siena,
Museo dell'Opera del Duomo.



Plate 283: Duccio,
Funeral of the Virgin,
detail of *Maestà*, tempera, 1308-11,
Siena,
Museo dell'Opera del Duomo.

Original in colour



Plate 284: Duccio, *Annunciation*,
detail of *Maestà* Predella, tempera, 1308-1311,
Siena, Museo dell'Opera del Duomo.



Plate 285: Duccio,
Nativity,
detail of *Maestà* Predella,
tempera, 1308-11,
Washington,
National Gallery of Art.

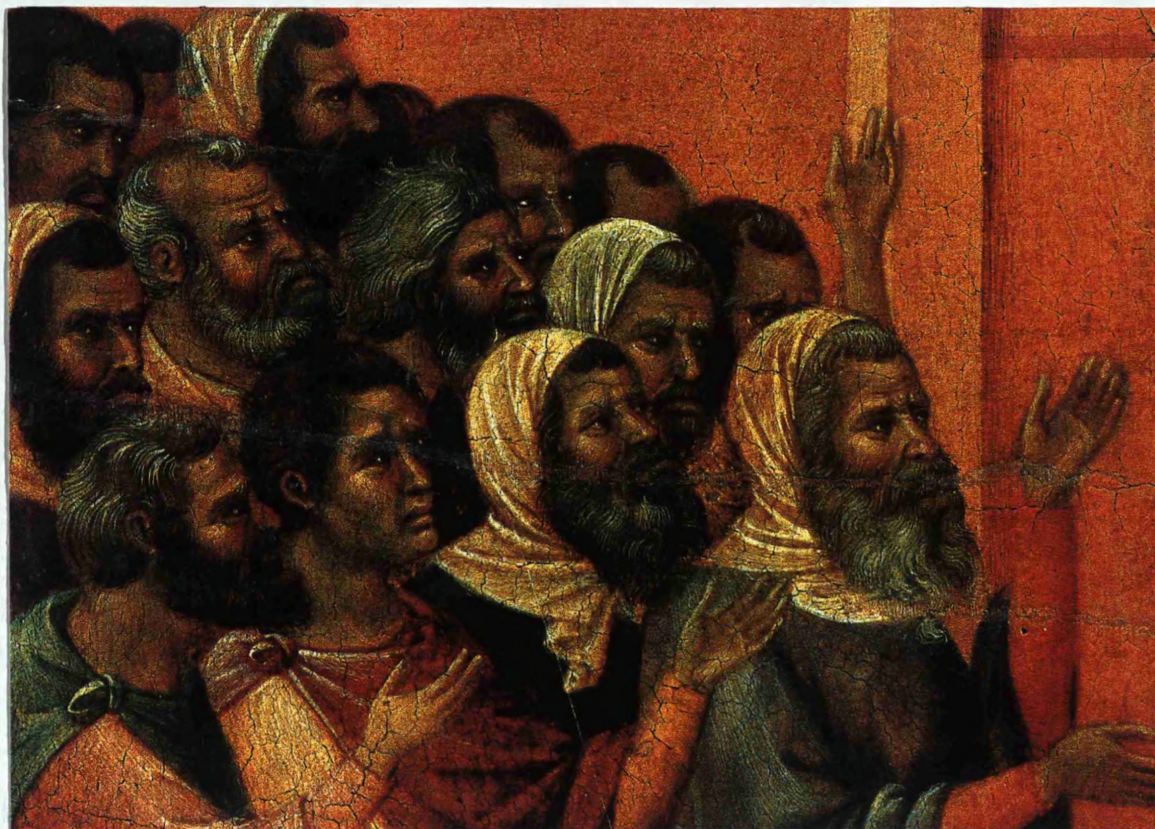


Plate 286: Duccio, *Pharisees Accuse Christ*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.



Plate 287: Duccio, detail of *Pharisees Accuse Christ*, *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.



Plate 288: Duccio, *Entry to Jerusalem*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.

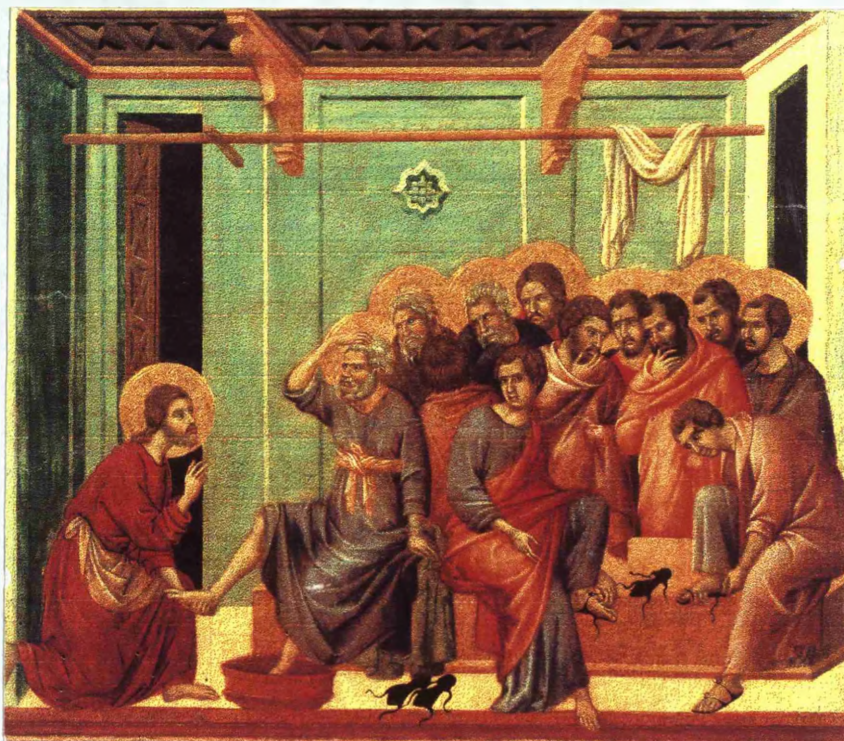


Plate 289: Duccio, *The Washing of Feet*, detail of *Maestà*, tempera, 1308-1311, Siena, Museo dell'Opera del Duomo.



Plate 290: Duccio, *Last Supper*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.



Plate 291: Duccio, *Arrest of Christ*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.



Plate 292: Duccio, *Pilate's First Interrogation of Christ*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.

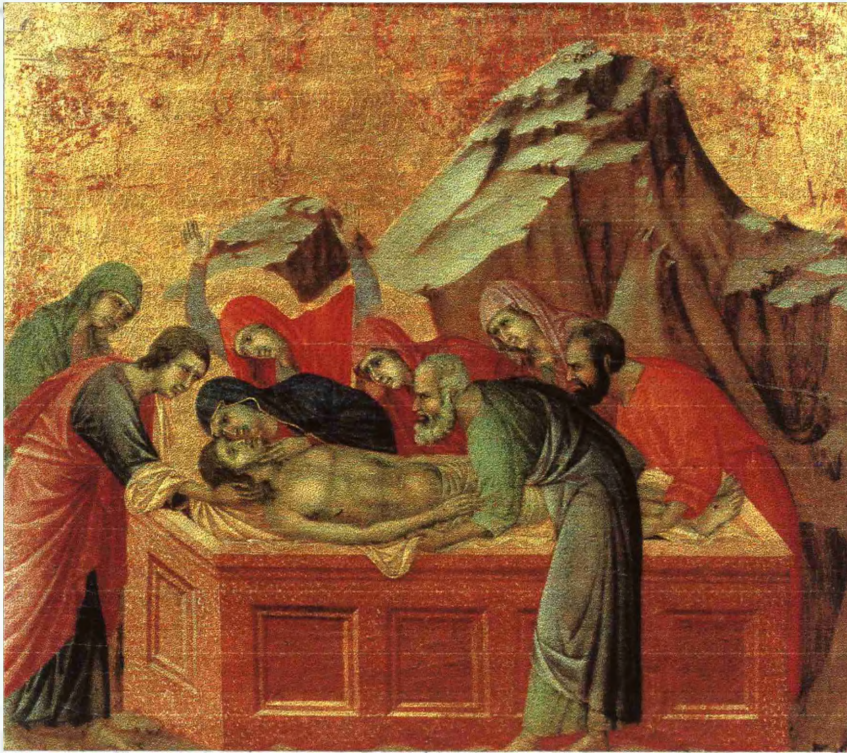


Plate 293: Duccio, *Entombment*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.



Plate 294: Duccio, *Doubting Thomas* detail of *Maestà*, tempera, 1308-1311, Siena, Museo dell'Opera del Duomo.



Plate 295: Duccio, *Pentecost*, detail of *Maestà*, tempera, 1308-11, Siena, Museo dell'Opera del Duomo.



Plate 296: Duccio, *Temptation on the Mount*, detail of *Maestà*, tempera, 1308-11, New York, Frick Collection.



Plate 297: Duccio, *Wedding at Cana*, detail of *Maestà*, tempera, 1308-1311, Siena, Museo dell'Opera del Duomo.



Plate 298: Duccio, *Healing of the Blind Man*, detail of *Maestà*, tempera, 1308-11, London, National Gallery.



Plate 299: Duccio, *Transfiguration*, detail of *Maestà*, tempera, 1308-11, London, National Gallery.



Plate 300: Ugolino di Nerio, *Arrest of Christ*, detail of *S. Croce Altarpiece*,
tempera, 1324-1325, London, National Gallery



Plate 301: Ugolino di Nerio, *Moses*, detail from
S. Croce Altarpiece, tempera, c.1324-25,
London, National Gallery.



Plate 302: Pietro Lorenzetti, *South Transept Lower Church S.Francesco Assisi, General View*, fresco, c.1317-20, Assisi, S.Francesco.

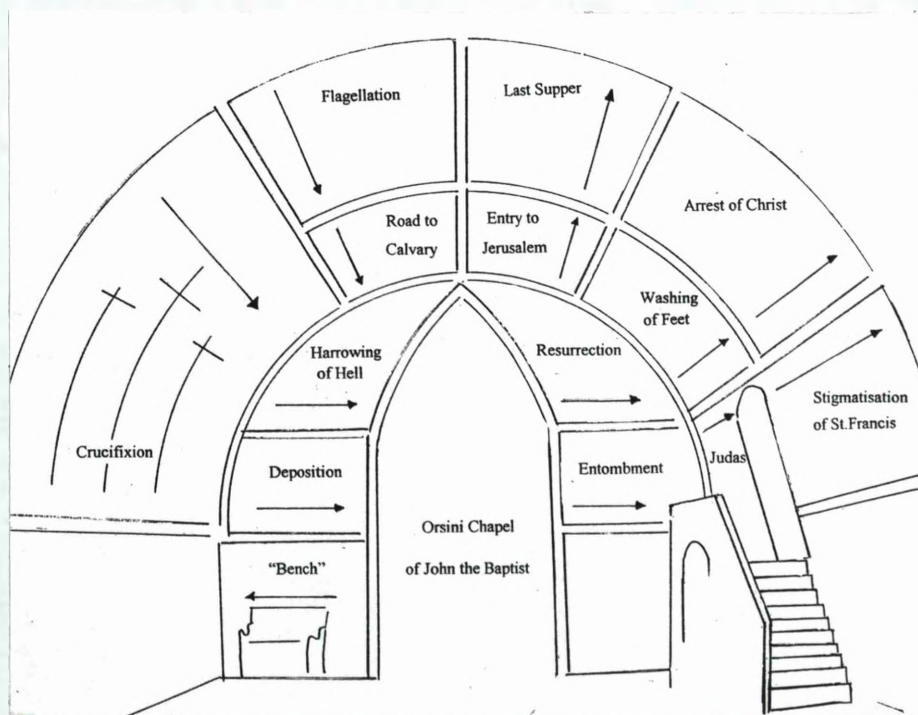


Plate 303: Sketch of direction of pictorial light in Plate 302 above.



Plate 304: Pietro Lorenzetti, *Entry to Jerusalem*, fresco, c.1317-20,
Assisi, S.Francesco, Lower Church.



Plate 305: Pietro Lorenzetti, *Disciples' Faces*, detail of *Entry to Jerusalem*, fresco, c.1317-20, Assisi, S.Francesco, Lower Church.



Plate 306: Pietro Lorenzetti, *Detail of Entry to Jerusalem* showing wall shadows, fresco, c.1317-1320, Assisi, S.Francesco Lower Church.



Plate 307: Pietro Lorenzetti, *Christ Washing His Disciples' Feet*, fresco, c.1317-20, Assisi, S.Francesco, Lower Church.

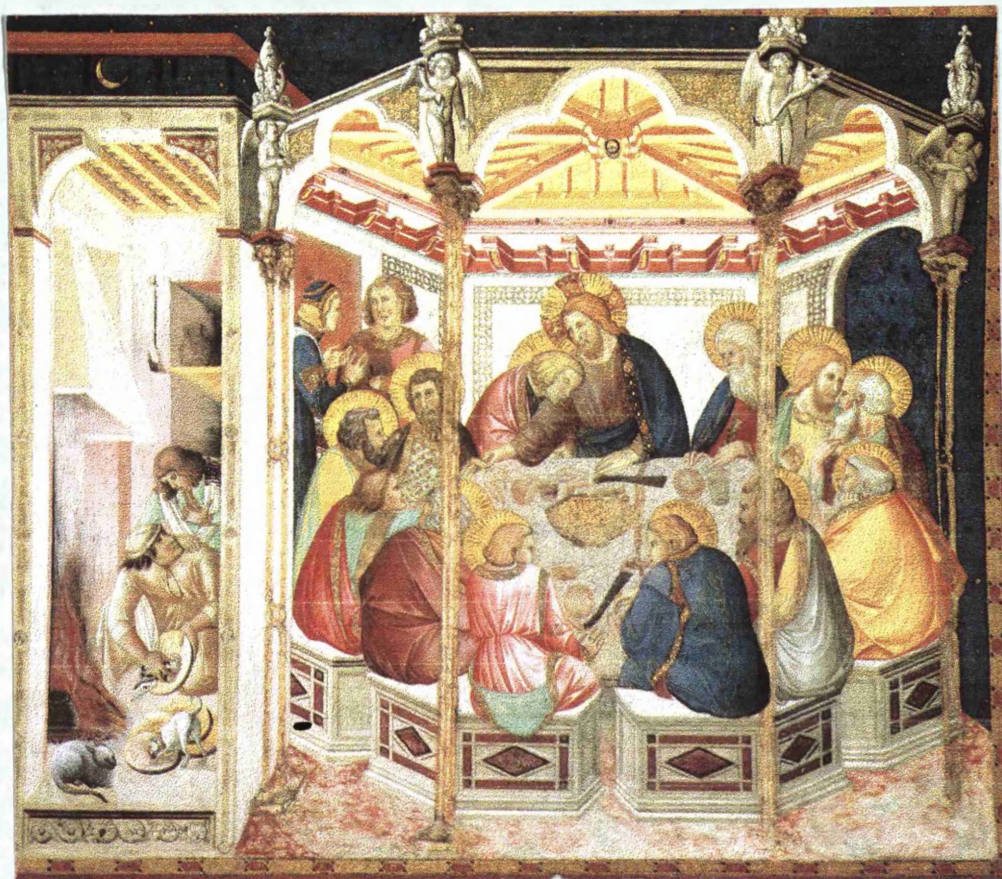


Plate 308: Pietro Lorenzetti,
Last Supper, fresco, c.1317-1320
Assisi, S.Francesco, Lower Church.

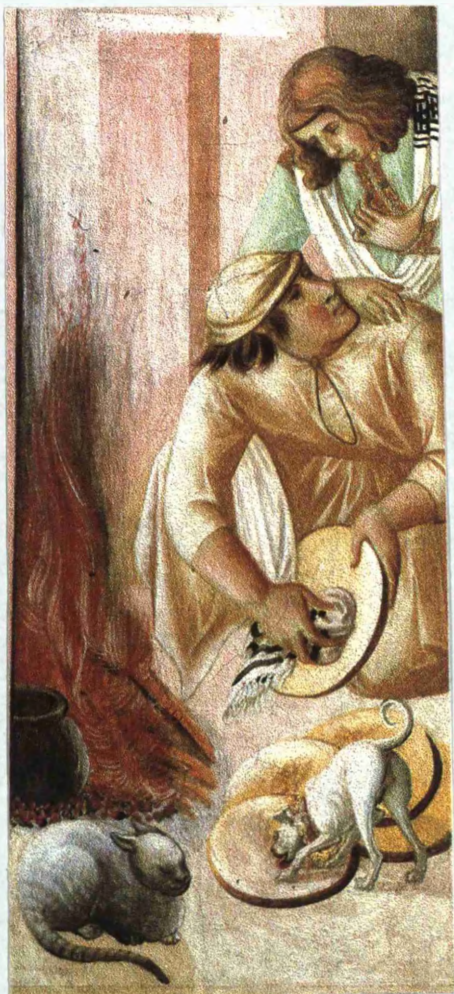


Plate 309: Pietro Lorenzetti,
detail of *Last Supper*,
fresco, c.1317-1320,
Assisi, S.Francesco, Lower Church.

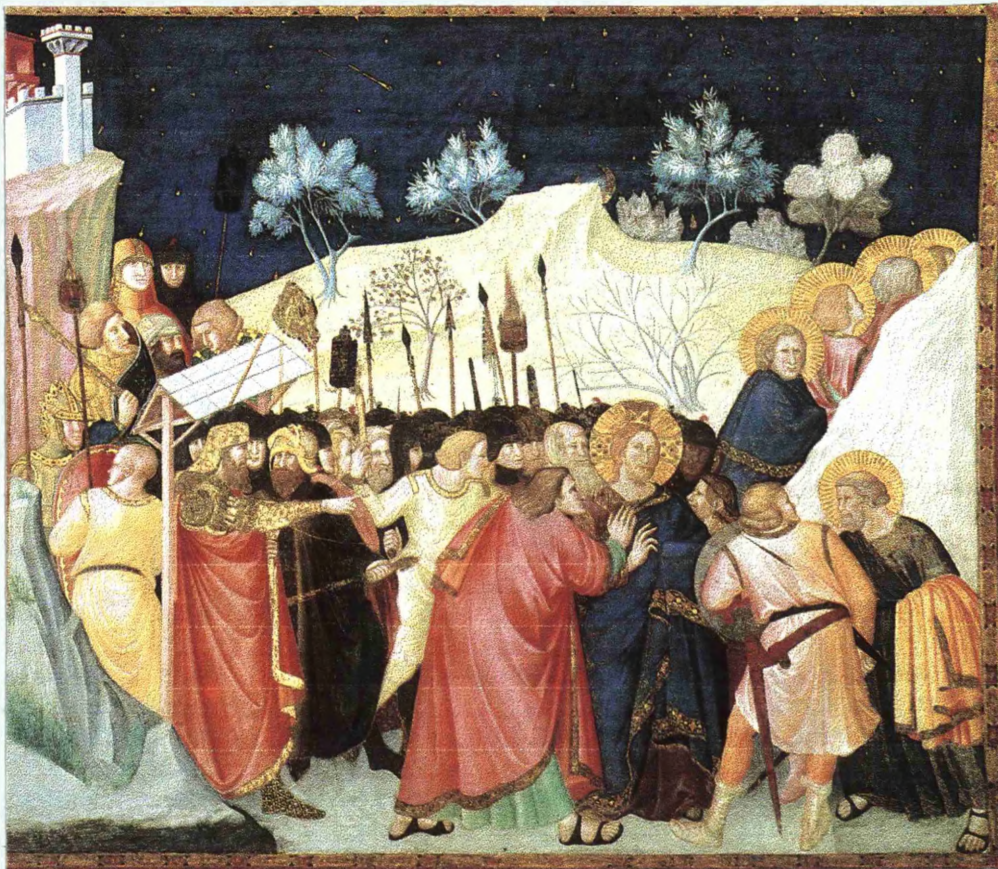


Plate 310: Pietro Lorenzetti, *Arrest of Christ*, fresco, c.1317-1320, Assisi, S.Francesco, Lower Church.

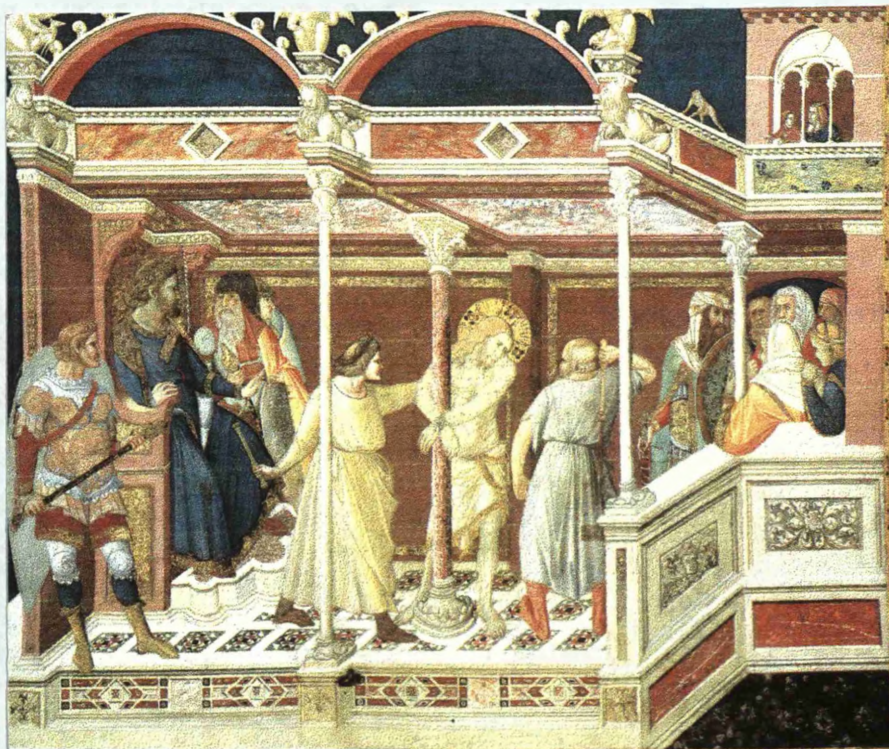


Plate 311: Pietro Lorenzetti, *Flagellation*, fresco, c.1317-20, Assisi, S.Francesco, Lower Church.

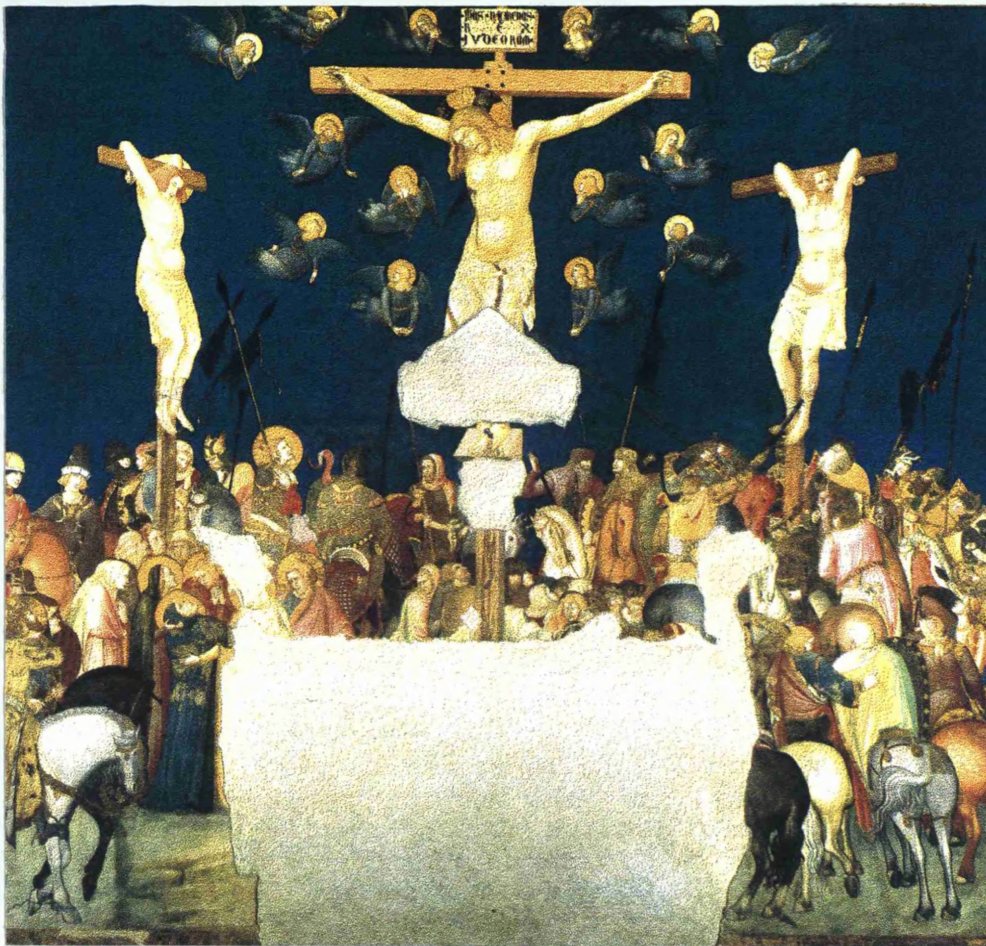


Plate 312: Pietro Lorenzetti, *Crucifixion*, fresco, c.1317-1320, Assisi, S.Francesco, Lower Church.



Plate 313: Pietro Lorenzetti, *Stigmatisation of St.Francis*, fresco, c.1317-20, Assisi, S.Francesco, Lower Church.



Plate 314: Pietro Lorenzetti, *Trompe l'oeil Bench and Niche*, fresco, c.1317-1320, Assisi, S.Francesco, Lower Church.



Plate 315: Pietro Lorenzetti, *Madonna and Child*, detail of Arezzo Polyptych, tempera, 1320, Arezzo, Pieve di S.Maria.



Plate 316: Pietro Lorenzetti, *Elijah's Well*, detail of Carmine Altarpiece Predella, tempera, c. 1327-8, Siena, Pinacoteca Nazionale.



Plate 317: Pietro Lorenzetti, *Madonna and Child with Angels*, tempera, 1340, Florence, Uffizi.

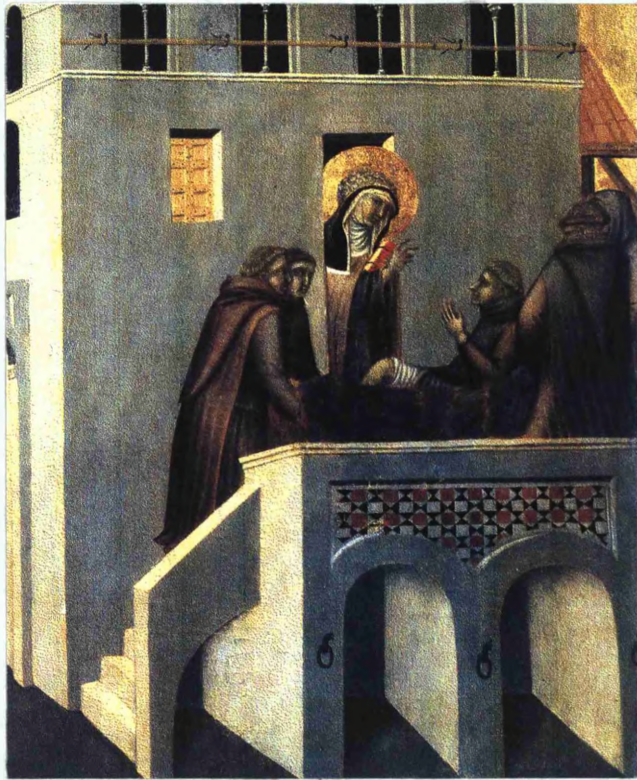


Plate 318: Pietro Lorenzetti, detail of *Beata Umiltà Altarpiece*,
tempera, c.1340, Florence, Uffizi.



Plate 319: Pietro Lorenzetti, *Nativity of the Virgin*, tempera, 1342, Siena, Museo dell'Opera del Duomo.

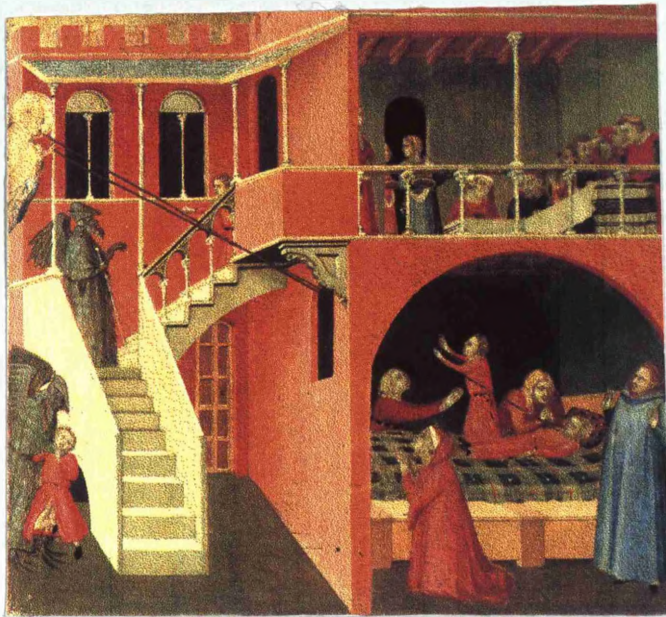


Plate 320: Ambrogio Lorenzetti, *The Life of St. Nicholas, Resurrection of the Boy*, tempera, c.1330-32, Florence, Uffizi.



Plate 321: Ambrogio Lorenzetti, *Massa Marittima Maestà*, tempera, 1335, Massa Marittima, Palazzo Comunale.

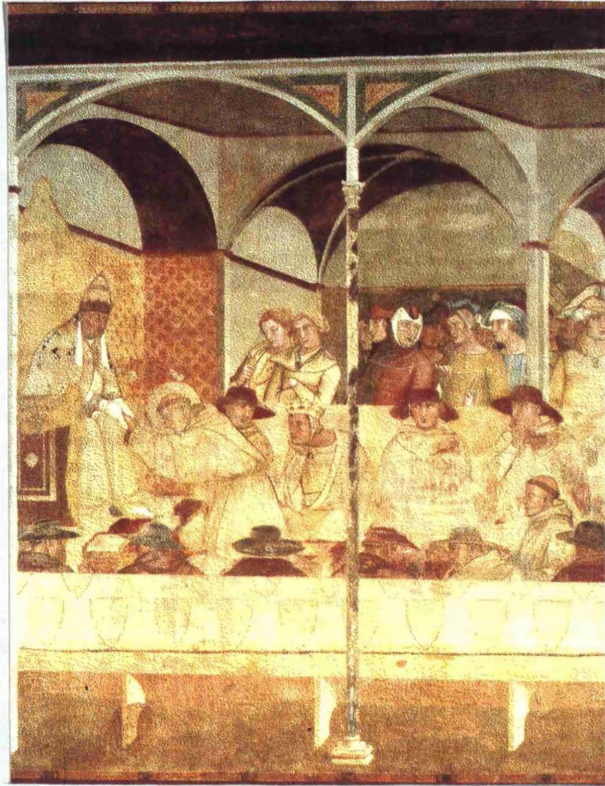


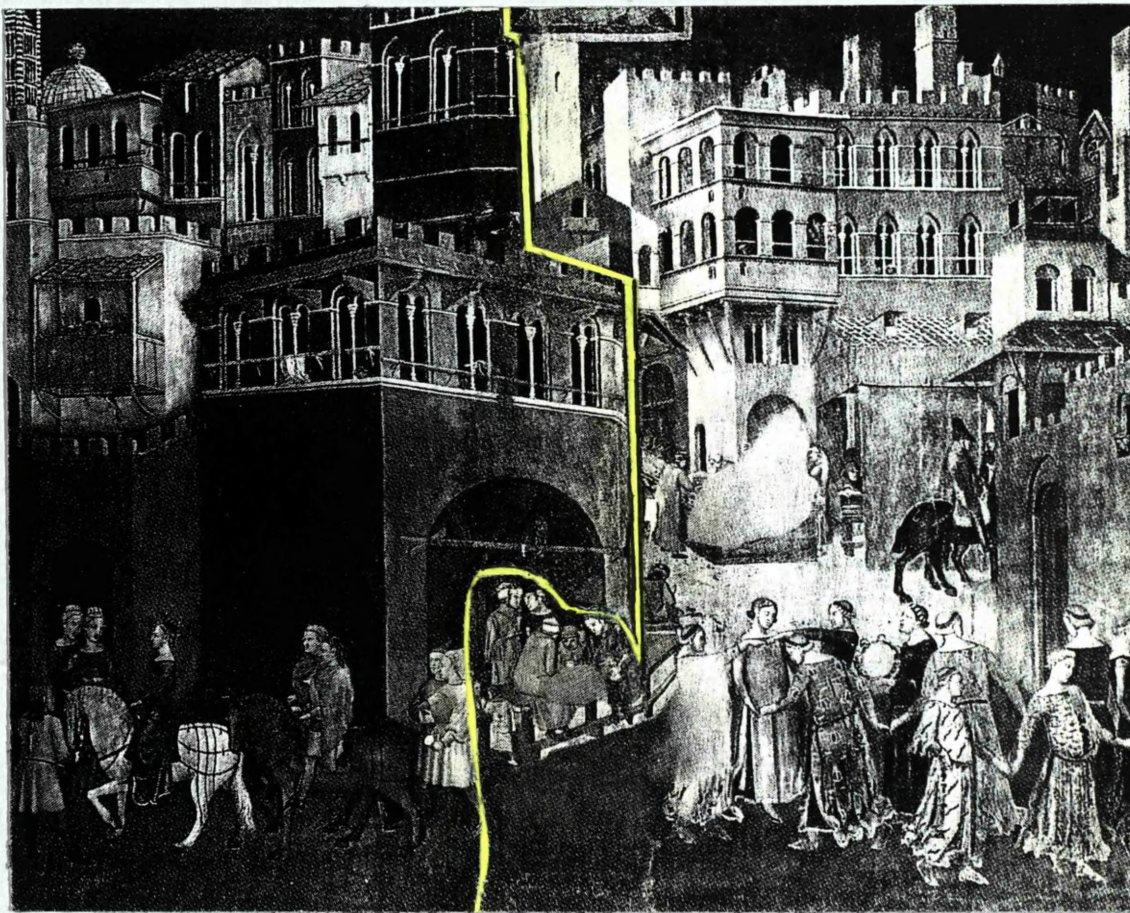
Plate 322: Ambrogio Lorenzetti, *Louis being Received by Boniface VIII*, fresco, c.1337, Siena, S.Francesco.



Plate 323: Ambrogio Lorenzetti, *City of Good Government*, fresco, 1337-40,
Siena, Palazzo Pubblico, Sala della Pace.



Plate 324: Ambrogio Lorenzetti, detail of *City of Good Government*, 1337-40,
Siena, Palazzo Pubblico, Sala della Pace.



Repainted

Original

Plate 325: Division of original and repainted work on
City of Good Government, following Brandi's report and sketch
 (Fig.2 p.120, in 'Chiarimenti sul Buon Governo di Ambrogio Lorenzetti',
Bollettino d'Arte, 40, 1955, pp. 119-123).



Plate 326: Andrea Vanni (?), *City of Good Government*, detail of repainted section, fresco, bet.1350-1360, Siena, Palazzo Pubblico, Sala della Pace.



Plate 327: Andrea Vanni (?), detail of buildings from *City of Good Government*, repainted section, fresco, bet. 1350-1360, Siena, Palazzo Pubblico, Sala della Pace.

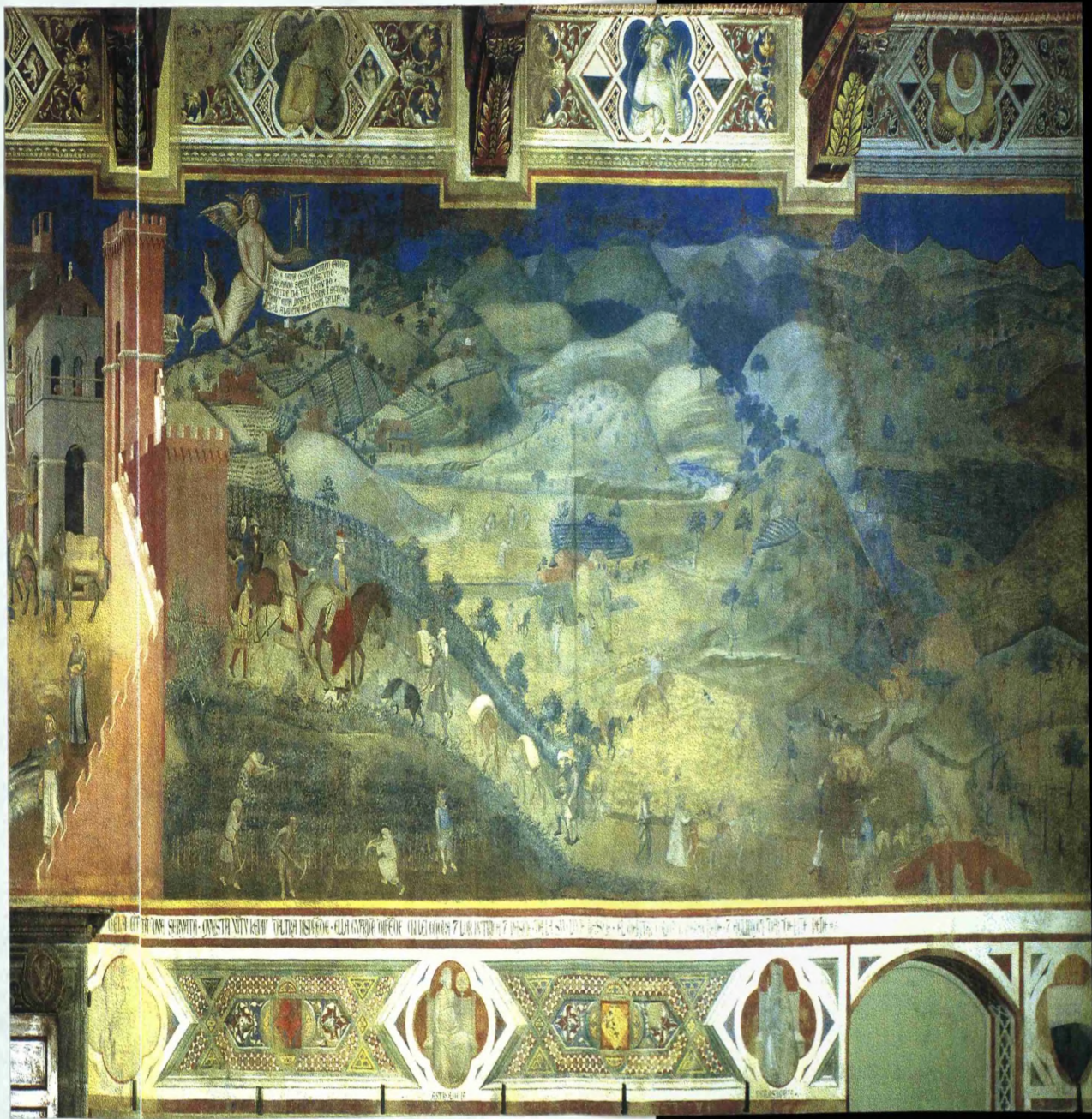


Plate 328: Ambrogio Lorenzetti, *The Well Governed Country*, fresco, 1337-40,
Siena, Palazzo Pubblico, Sala della Pace.



Plate 329: Ambrogio Lorenzetti, detail from *The Well Governed Country*, fresco, 1337-40, Siena, Palazzo Pubblico, Sala della Pace.

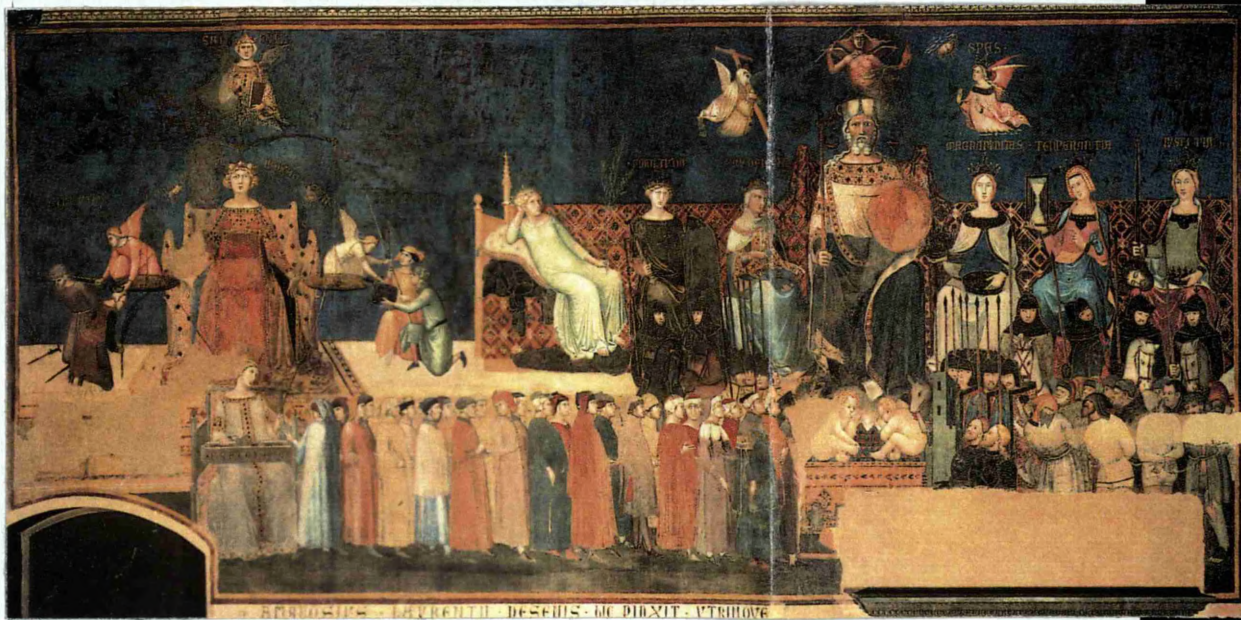


Plate 330: Ambrogio Lorenzetti, *The Allegory of Good Government*, fresco, 1337-40, Siena, Palazzo Pubblico, Sala della Pace.

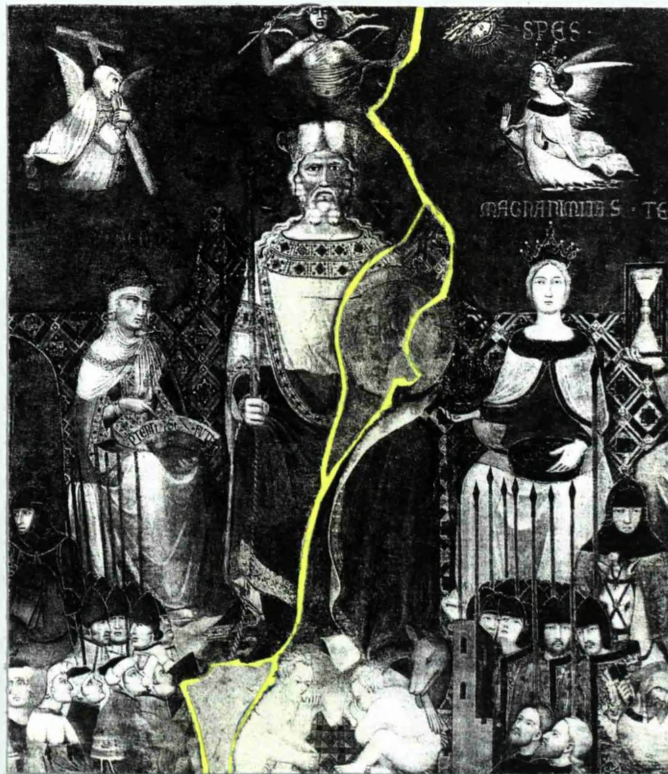


Plate 331: Division of original and repainted work on *The Allegory of Good Government*, following Brandi's report and sketch, (Fig.1 p.119, in 'Chiarimenti sul Buon Governo di Ambrogio Lorenzetti', *Bollettino d'Arte*, 40, 1955, pp. 119-123).



Plate 332: Andrea Vanni (?), *Magnanimita, Temperantia, Iustitia*,
detail of *Allegory of Good Government*,
repainted section, fresco, bet. 1350-1360,
Siena, Palazzo Pubblico, Sala della Pace.



Plate 333: Ambrogio Lorenzetti, the little *Maestà*, tempera, c.1340, Siena, Pinacoteca Nazionale.

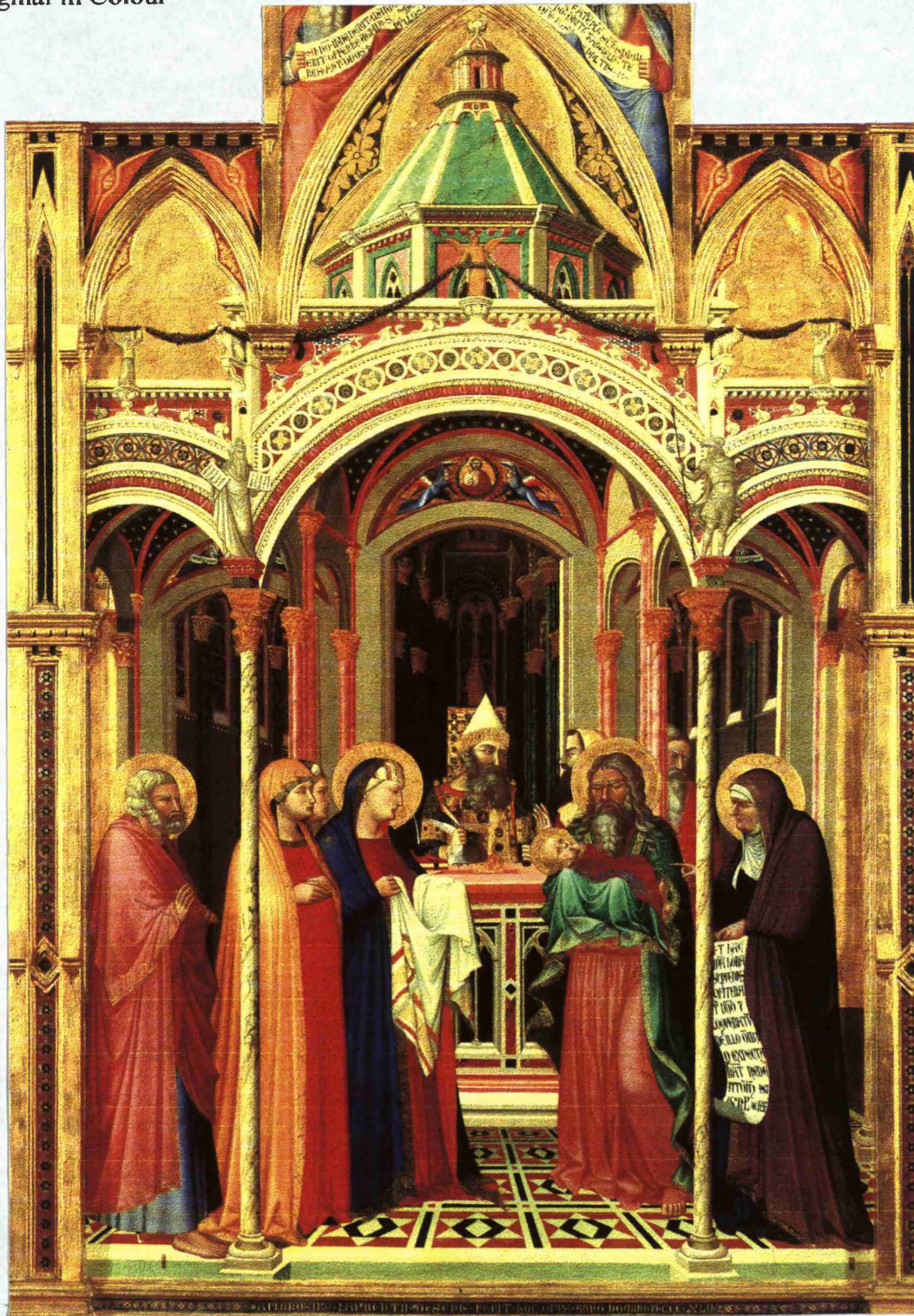


Plate 334: Ambrogio Lorenzetti, *Presentation in the Temple*, tempera, 1342, Siena, Museo dell'Opera del Duomo.

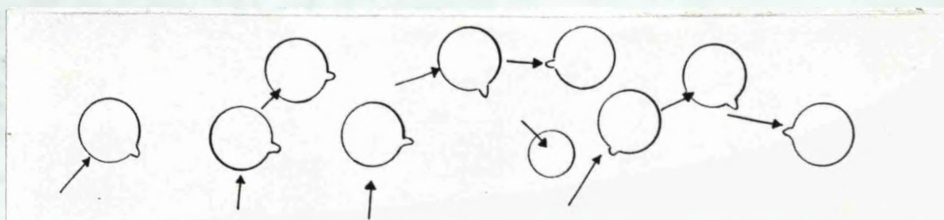


Plate 335: Sketch plan indicating local directions of light in Pl.334 above.



Plate 336: Ambrogio Lorenzetti, *Simon and Infant Christ*,
detail of *Presentation in the Temple*,
tempera, 1332, Siena, Museo dell'Opera del Duomo



Plate 337: Simone Martini, *Madonna and Child*, tempera, c.1308-1310, Siena, Pinacoteca (No.583).

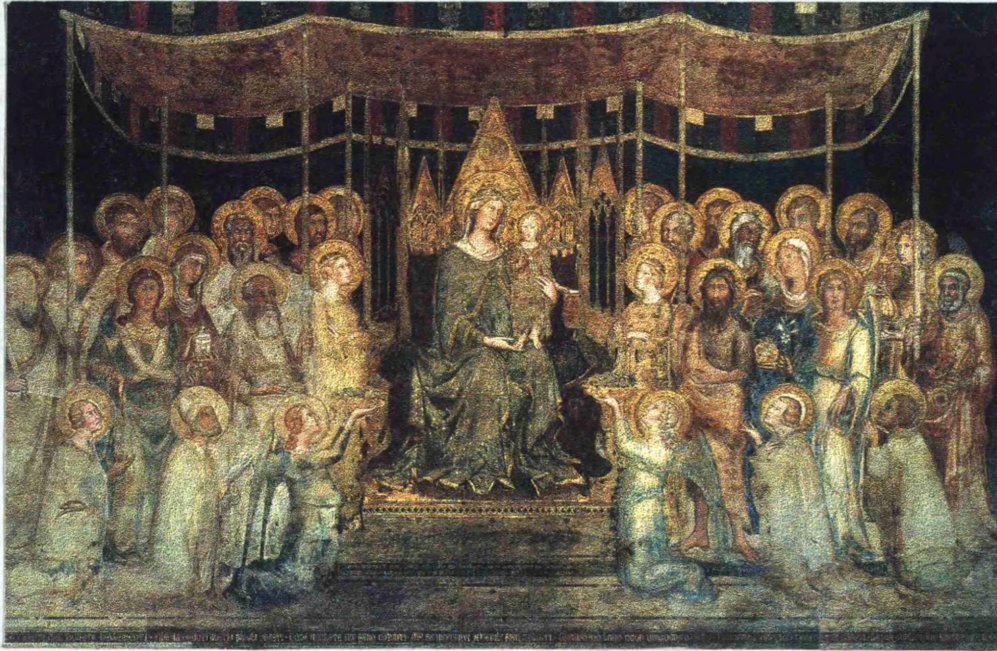


Plate 338: Simone Martini, *Maestà*, fresco, 1315 Siena, Palazzo Pubblico.



339: Simone Martini,
Virgin and Child,
detail of *Maestà*,
fresco, 1315,
Siena, Palazzo Pubblico.



Plate 340: Simone Martini,
SS. Louis of France & Louis of Toulouse, and SS. Clare & Elizabeth of Hungary,
fresco, c.1317, Assisi, S.Francesco, St.Martin Chapel.



Plate 341: Simone Martini, *The Knighting of St. Martin*, fresco, c.1317
Assisi, S. Francesco, Lower Church, St. Martin Chapel.



Plate 342: Simone Martini, *Musicians*, detail of *Knighting of St. Martin*, fresco, c.1317, Assisi, S. Francesco, Lower Church, St. Martin Chapel.



Plate 343: Simone Martini, *Dream of St. Martin*, fresco, c.1317,
Assisi, S. Francesco, Lower Church, St. Martin Chapel.



Plate 344: Simone Martini, *St. Martin Renouncing the Sword* fresco, c.1317, Assisi, S. Francesco, Lower Church, St. Martin Chapel.



Plate 345: Simone Martini, detail of *St. Martin Renouncing the Sword* fresco, c.1317, Assisi, S. Francesco, Lower Church, St. Martin Chapel.



Plate 346: Simone Martini, *Burial of St. Martin*, fresco, c. 1317,
Assisi, S. Francesco, Lower Church, St. Martin Chapel.



Plate 347: Simone Martini, detail of *Burial of St. Martin*, fresco, c.1317, Assisi, S. Francesco, Lower Church, St. Martin Chapel.



Plate 348: Simone Martini, *Santa Caterina Altarpiece*, tempera, 1319, Pisa, Museo Nazionale.

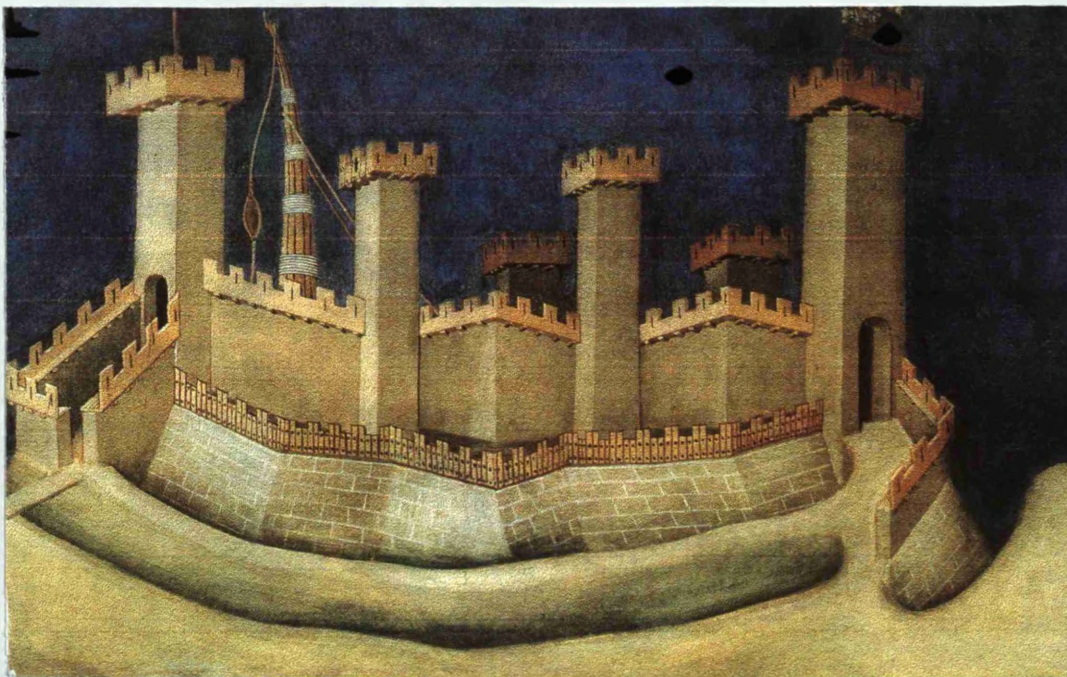


Plate 349: Simone Martini (?), detail of *Guidoriccio da Fogliano*, fresco, 1330 ?, Siena, Palazzo Pubblico.



Plate 350: Simone Martini, *Gabriel*, detail of *Annunciation*,
tempera, 1333, Florence, Uffizi.



Plate 351: Jacopo di Cione, *The Zecca Coronation*, tempera, 1373,
Florence, Galleria dell'Accademia.



Plate 352: Jacopo di Cione and collaborators, *Crucifixion*, tempera, 1370's, London, National Gallery.



Plate 353: Jacopo di Cione, *Coronation of the Virgin*,
detail of *San Pier Maggiore Altarpiece*,
tempera, 1370-71, London, National Gallery.



Plate 354: Jacopo di Cione, *Saints*, detail of *San Pier Maggiore Altarpiece*, tempera, 1370-71, London, National Gallery.



355: Jacopo di Cione,
St. Stephen, detail from
San Pier Maggiore Altarpiece,
tempera, c.1370,
London, National Gallery.



356: Jacopo di Cione,
The Three Marys at the Tomb,
San Pier Maggiore Altarpiece,
tempera, c.1370,
London National Gallery.



Plate 357: Jacopo di Cione,
Nativity and Annunciation to the Shepherds,
detail of
San Pier Maggiore Altarpiece,
tempera, 1370-71,
London, National Gallery



Plate 358: Jacopo di Cione,
Adoration of the Magi,
detail of
San Pier Maggiore Altarpiece,
tempera, 1370-71,
London, National Gallery



Plate 359: Guariento, *Judith and Holofernes*, fresco, c.1350,
Padua, Accademia Patavina.



Plate 360: Guariento, *St. Augustine Receiving the Habit and His Baptism*, fresco, c. 1366-70, Padua, Church of the Eremitani.



Plate 361: Guariento, *Coronation of the Virgin*, fresco, c. 1351, Padua, Church of the Eremitani.

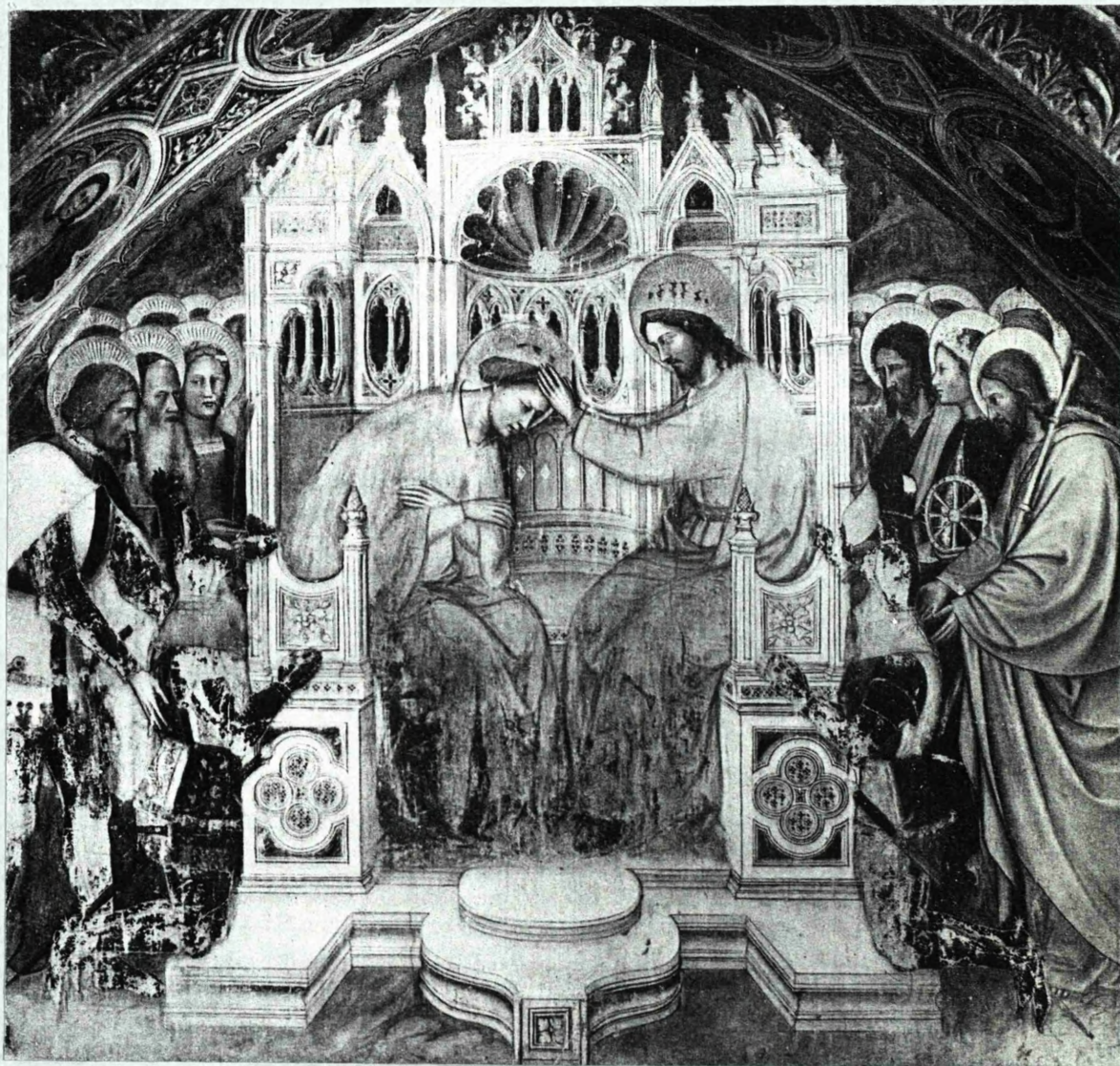


Plate 362: Altichiero, *Coronation of the Virgin*, fresco, c 1380,
Padua, Church of the Eremitani. (Destroyed 1944).



Plate 363: Altichiero, *Soldiers*, detail of *Crucifixion*, fresco, 1377-1379,
Padua, Il Santo, Capella di S. Giacomo.



Plate 364: Altichiero, *Mary and Attendant Crowd*, detail of *Crucifixion*, fresco, 1377-1379, Padua, Il Santo, Capella di San Giacomo.



Plate 365: Altichiero, detail of *Funeral of St. Lucy*, fresco, 1379-84,
Padua, Oratorio di S. Giorgio.



Plate 366: Altichiero, *Bystanders detail of Torture of St George*, fresco, 1379-84, Padua, Oratorio di S. Giorgio.



Plate 367: Altichiero, *Bystanders* detail of *Torture of St George*, fresco, 1379-84, Padua, Oratorio di S. Giorgio.



Plate 368: Altichiero, *Soldiers*, detail of *Crucifixion*, fresco, 1379-84,
Padua, Oratorio di S. Giorgio.

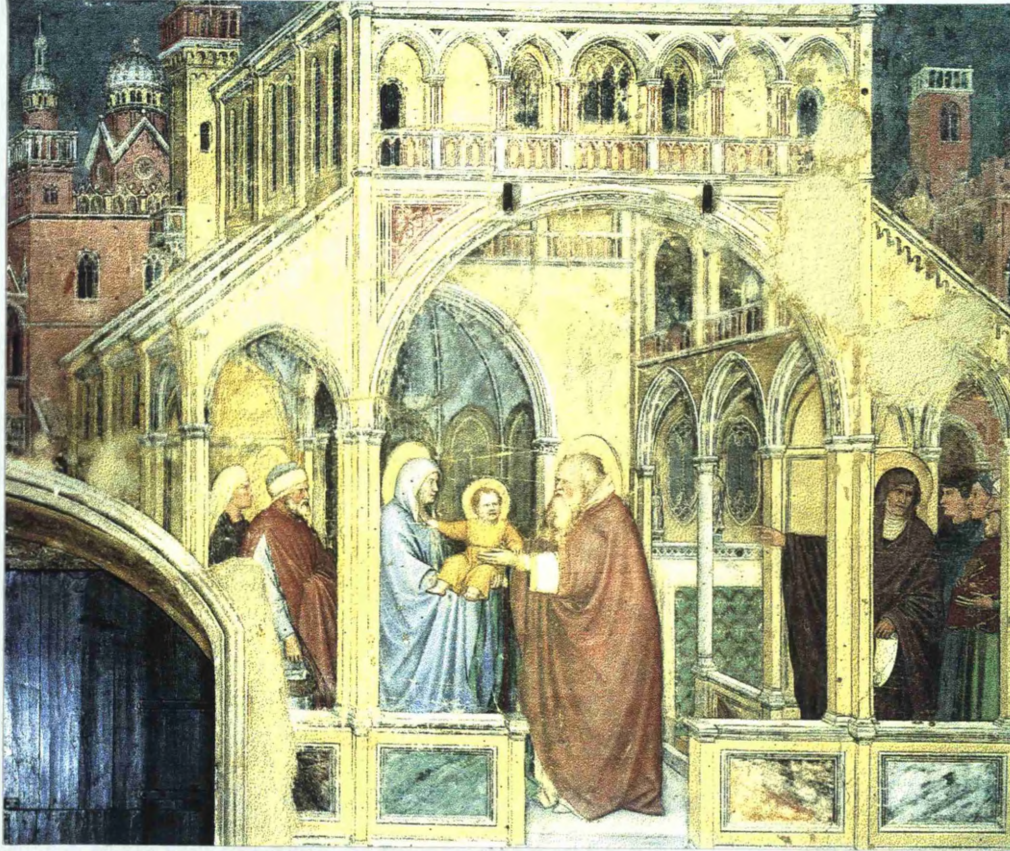


Plate 369: Altichiero, *Presentation in the Temple*, fresco, 1379-84,
Padua, Oratorio di San Giorgio.



Plate 370: Altichiero, *Coronation of the Virgin*, fresco, 1379-84,
Padua, Oratorio di San Giorgio.



Plate 371: Altichiero, *Martyrdom of St. George*, fresco, 1379-84,
Padua, Oratorio di S. Giorgio.



Plate 372: Altichiero, Window shadows, background detail of
St. Lucy before Judge Pascasio, fresco, 1379-84,
Padua, Oratorio di S. Giorgio.

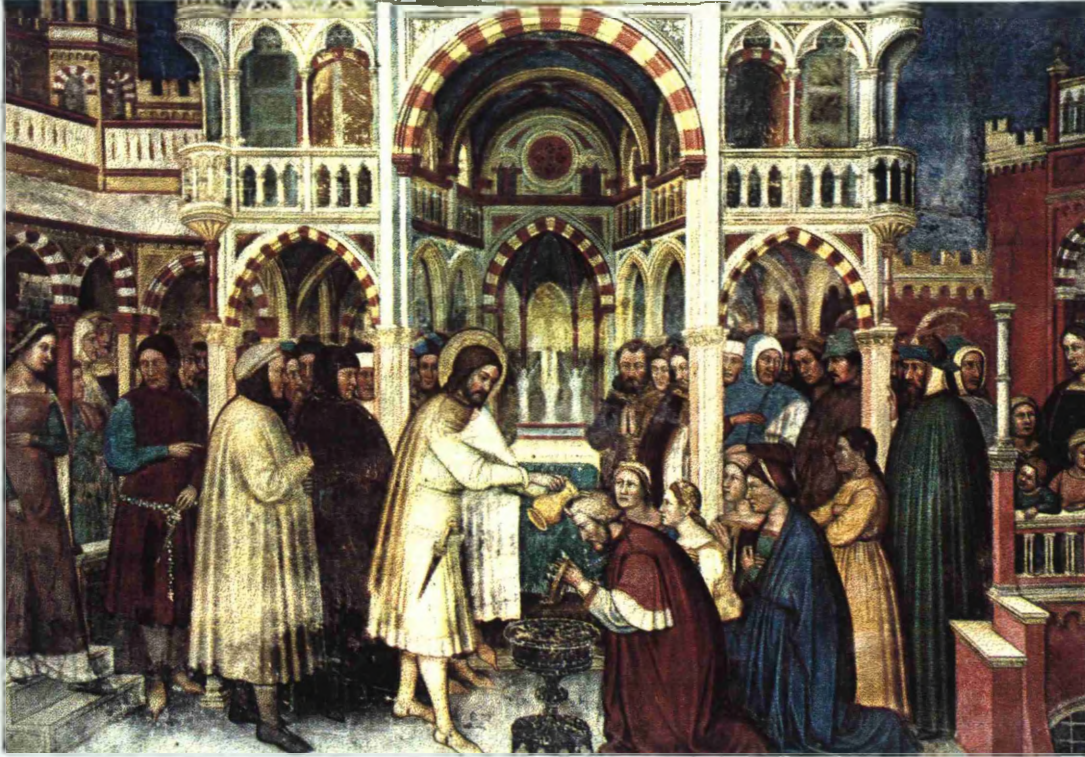


Plate 373: Altichiero, *St George Baptising King Sevio and his Court*, fresco, 1379-84, Padua, Oratorio di S. Giorgio.



Plate 374: Avanzi, *Miraculous Burial of St. James; Queen Lupa told of the Miracle*, fresco, bet. 1377-1379, Padua, Il Santo, Capella di S. Giacomo.

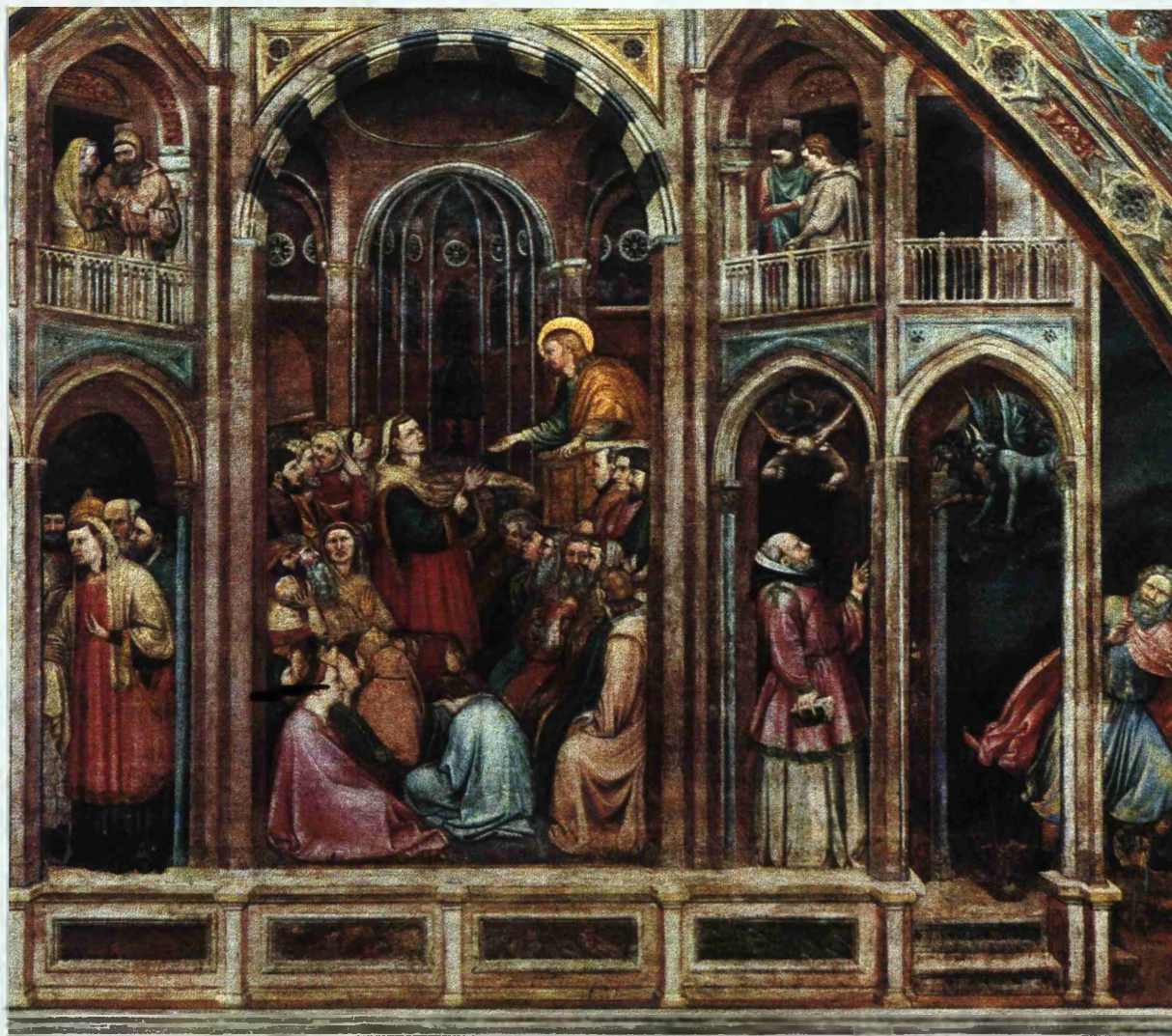


Plate 375: Avanzi, *St. James Disputing with Filetus*, fresco, bet. 1377-1379,
Padua, Il Santo, Capella di San Giacomo.

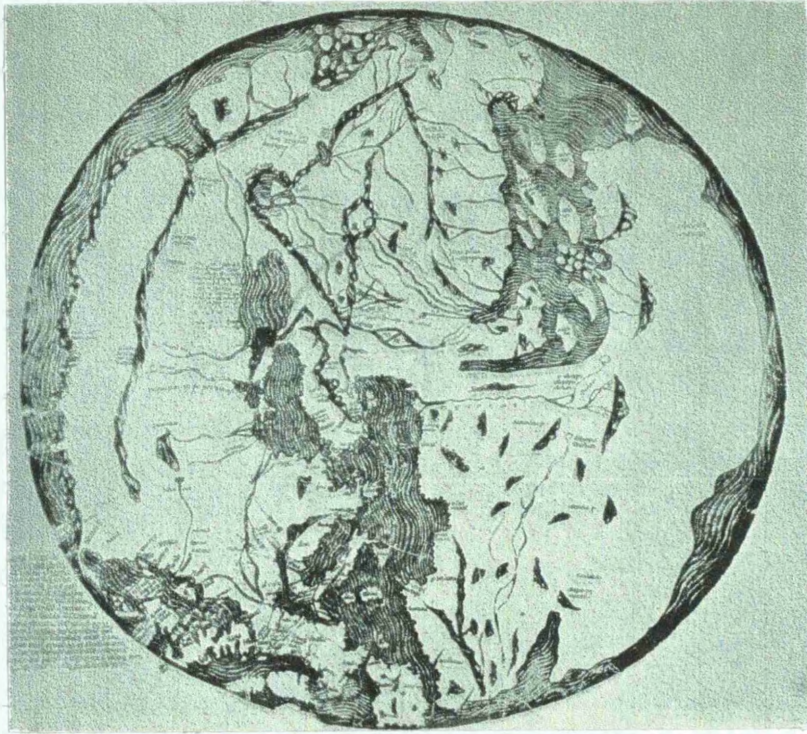


Plate 376: Marino Sanuto, *Map of the World*, c.1306-21, Paris, Bibliothèque Nationale.



Plate 377: Giusto de' Menabuoi, *Creation of the World*, fresco, 1370's, Padua, Duomo Baptistery.



Plate 378: Giusto de' Menabuoi, *Adoration of the Magi*, fresco, 1370's, Padua, Duomo Baptistery.



Plate 379: Giusto de' Menabuoi, *The Calling of St. Matthew*, fresco, mid 1370's, Padua, Duomo Baptistery.



Plate 380: Giusto De'Menabuoi, *Annunciation*, fresco. Mid 1370's, Padua, Duomo Baptistery.

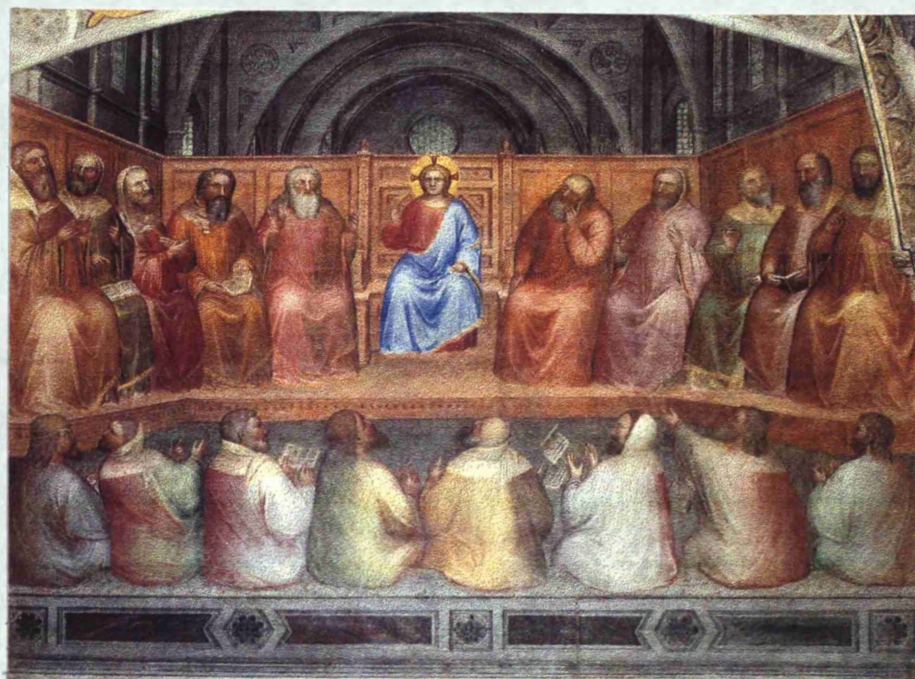


Plate 381: Giusto de'Menabuoi, *Christ Among the Doctors*, fresco, mid 1370's, Padua Duomo Baptistery.



Plate 382: Giusto de' Menabuoi, *Presentation of the Virgin*, mid 1370's, Padua, Duomo Baptistery.



Plate 383: Giusto de' Menabuoi, *Arrest of Christ*, fresco, mid 1370's, Padua, Duomo Baptistery.



Plate 384: Tomaso da Modena, *Albertus Magnus and Johann di Sassonia*, fresco, 1351-52, Treviso, S.Nicolò, Capitolo.



Plate 385: Tomaso da Modena, *St. Jerome*, fresco, 1350's,
Treviso, S. Nicolò.

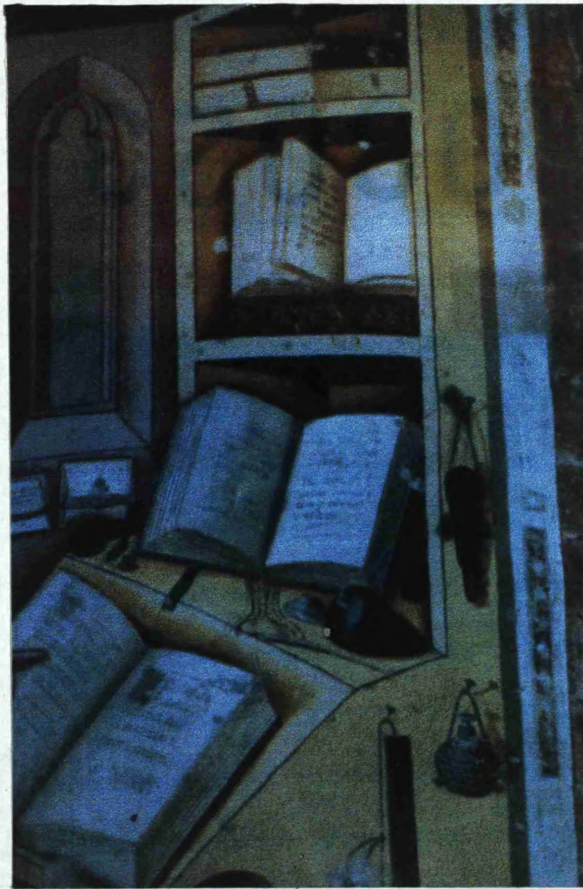


Plate 386: Tomaso da Modena, Ink bottle and quill box shadows,
detail of *St. Jerome*, fresco, 1350's, Treviso, S.Nicolò.



Plate 387: Bottega di S.Francesco, Maestro di Feltre (?),
St. Anthony Abbot, fresco, c.1350's,
Treviso, S.Francesco, Cappella Coletti.



Plate 388: Vitale da Bologna, detail of *Coronation of the Virgin*,
tempera, c.1350, Bologna, Pinacoteca Nazionale.

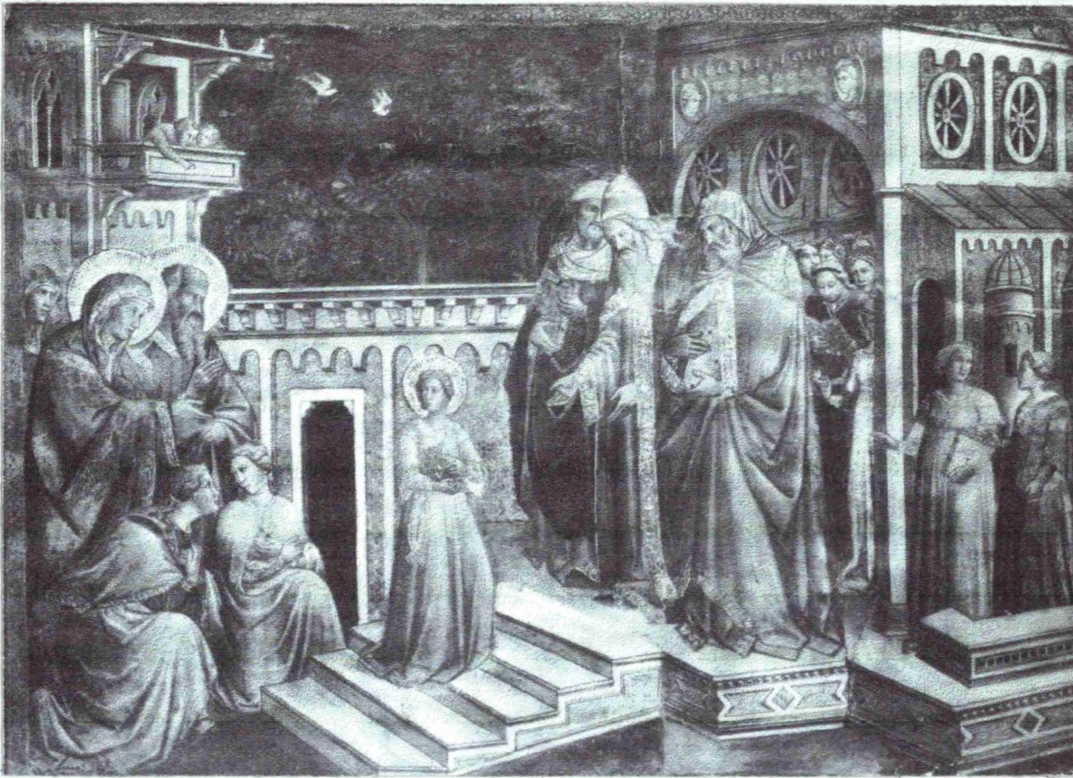


Plate 389: Agnolo Gaddi, *Presentation of the Virgin*, fresco, c.1380's, Prato, Duomo.



Plate 390: Agnolo Gaddi, *Discovery and Testing of the True Cross*, fresco, c.1380, Florence, Santa Croce.

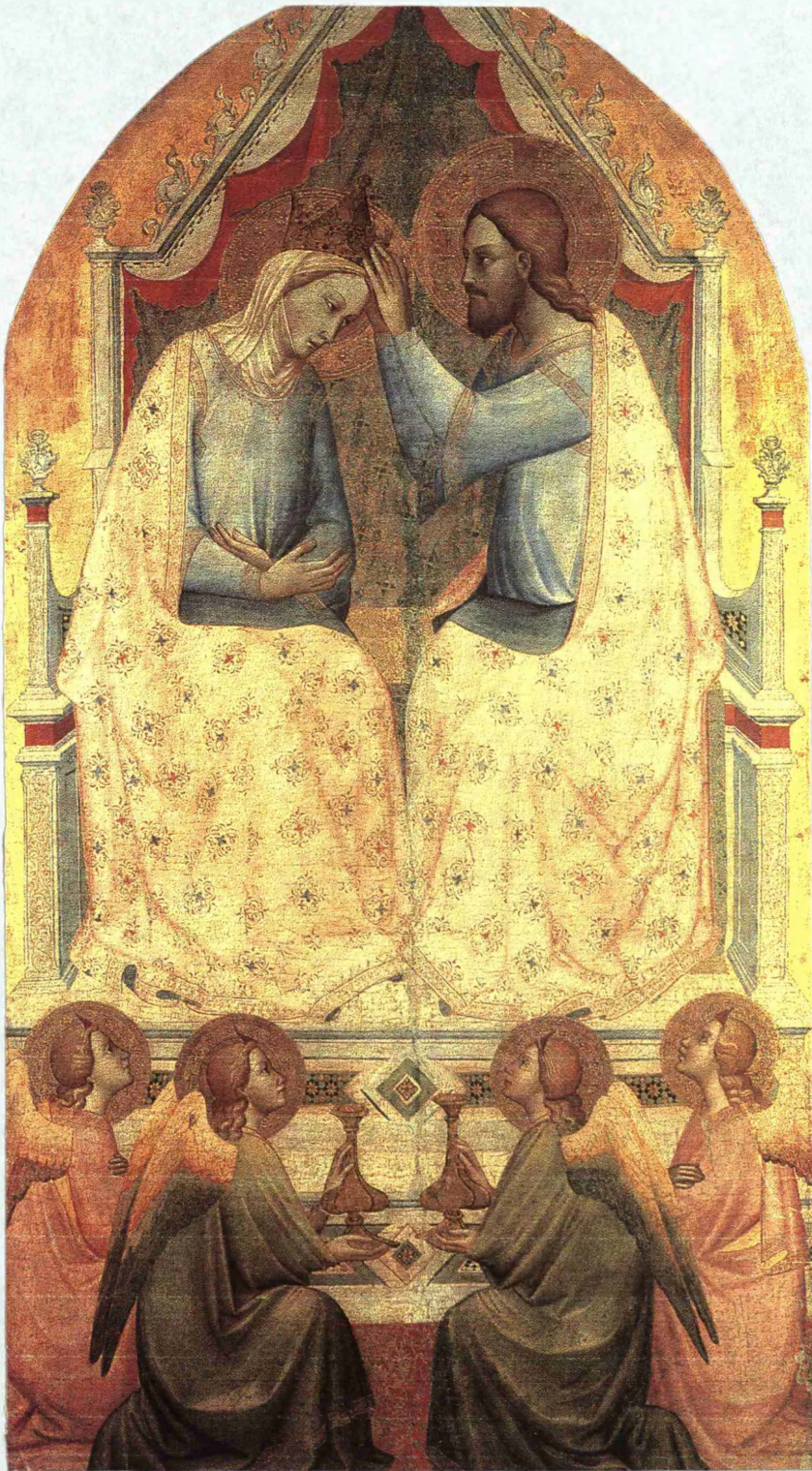


Plate 391: Agnolo Gaddi, *Coronation of the Virgin*, tempera, c.1380, London National Gallery.



Plate 392: Agnolo Gaddi, *Coronation of the Virgin*, tempera, c.1388-93, Washington, National Gallery.

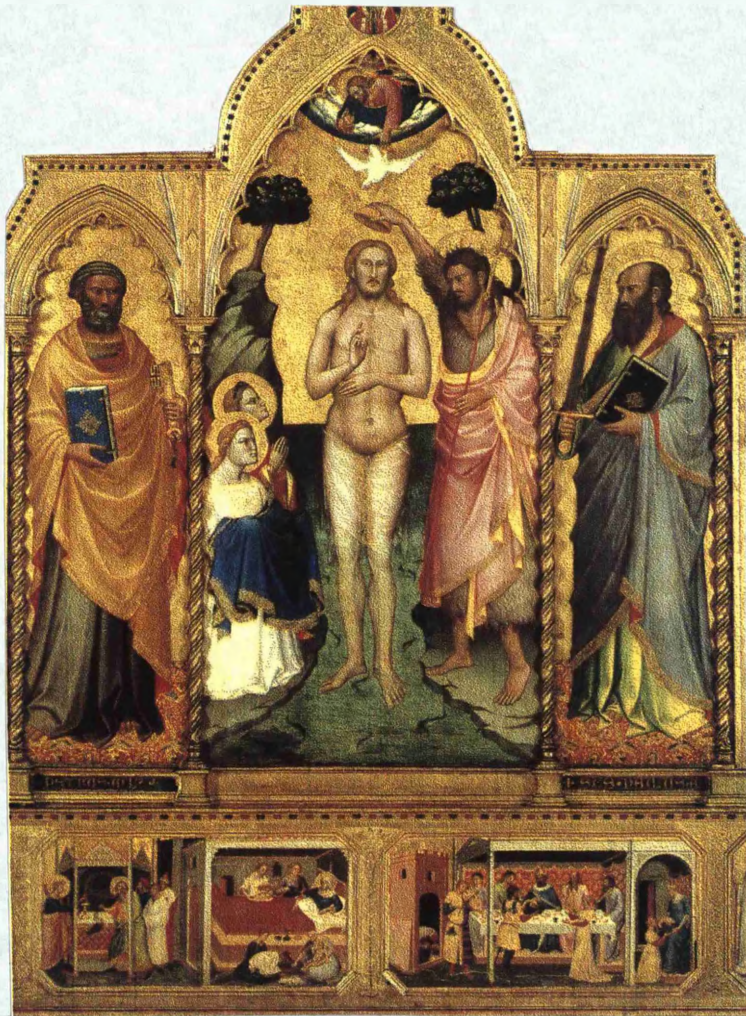


Plate 393: Niccolò di Pietro Gerini, *Baptism of Christ, with SS. Peter and Paul*, tempera, 1387, London National Gallery.



Plate 394: Spinello Aretino, *St. Benedict receives King Totila*, fresco, 1385-87, Florence, San Miniato al Monte, Sacristy.

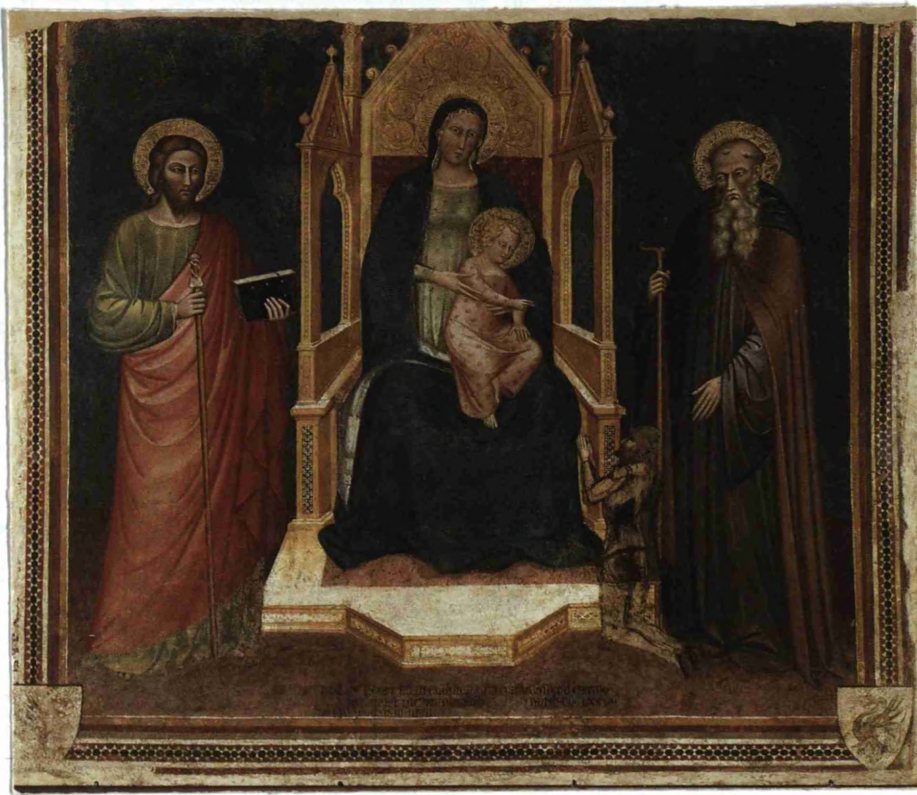


Plate 395: Spinello Aretino *Madonna and Child Enthroned with Two Saints*, fresco, c.1390's, Arezzo, Duomo.



Plate 396: Spinello Aretino & Parri di Spinello, detail of *Life of Alexander III*, fresco, 1407-08, Siena, Palazzo Pubblico, Sala di Balia.

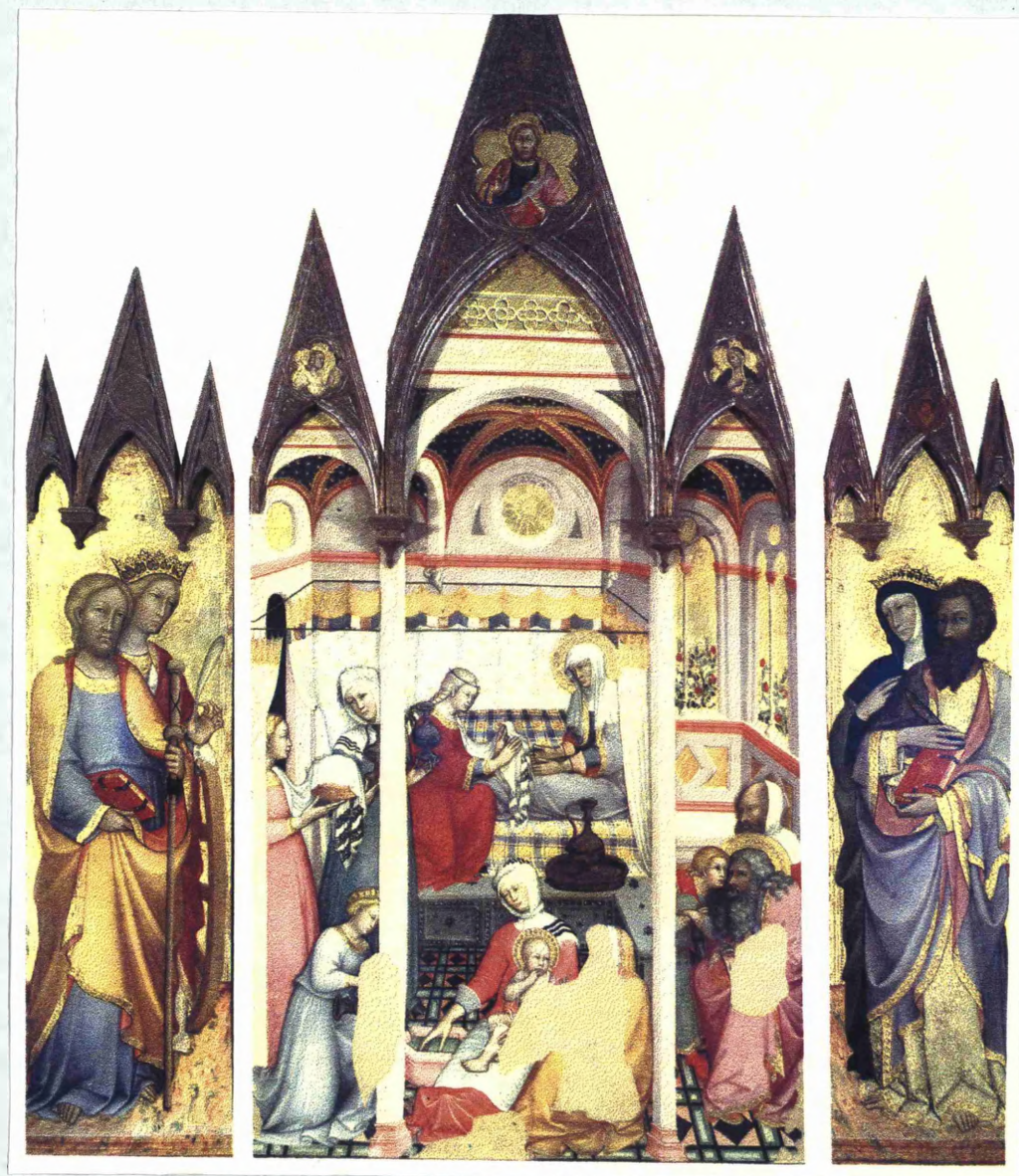


Plate 397: Paolo di Giovanni Fei, *Nativity of the Virgin with Saints*,
tempera, 1390-1400, Siena, Pinacoteca.



Plate 398: Gentile da Fabriano, *Stigmatisation of St. Francis*, tempera, c. 1400-1410, Traversetolo (Parma), Fondazione Magnani.

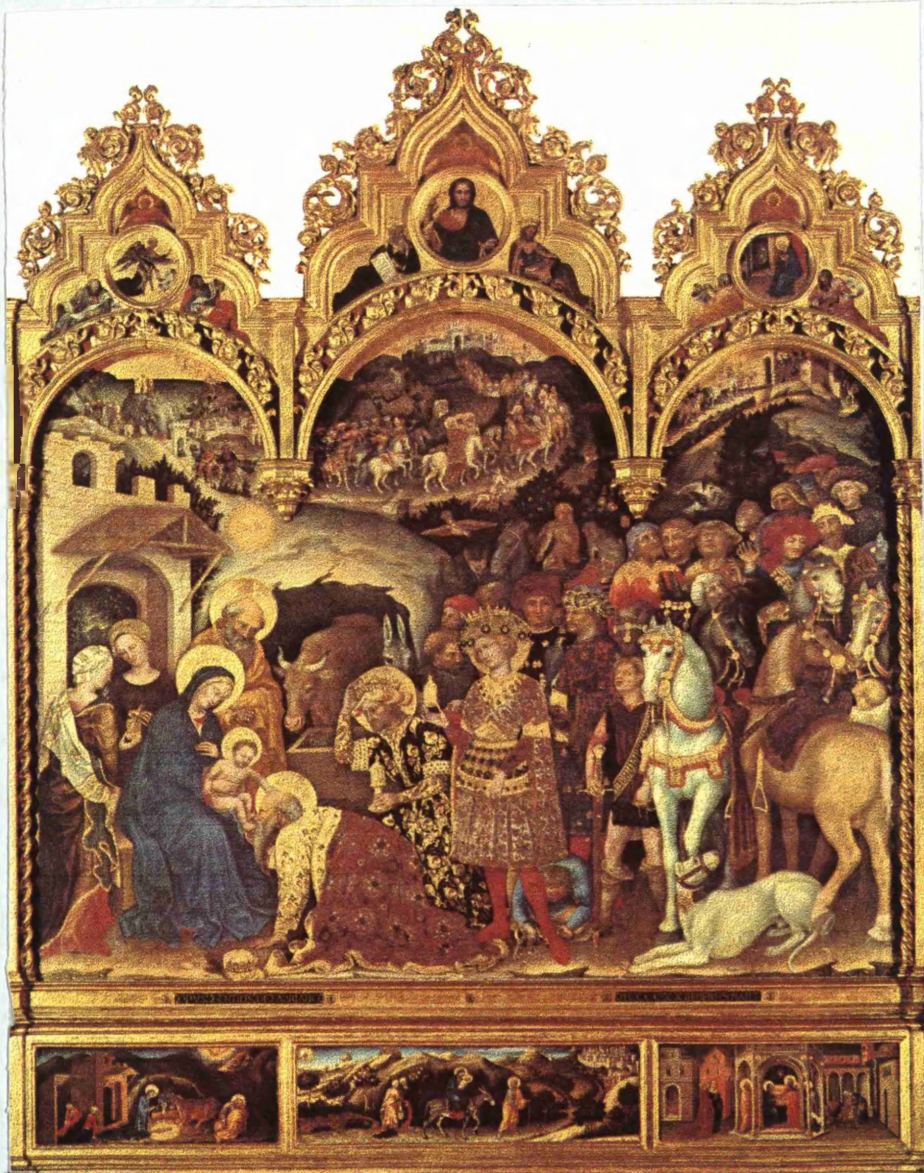


Plate 399: Gentile da Fabriano, *Adoration of the Magi Altarpiece*, tempera, 1423, Florence, Uffizi.



Plate 400: Gentile da Fabriano, *Nativity*,
Predella of the *Adoration of the Magi* Altarpiece,
tempera, 1423, Florence, Uffizi.



Plate 401: Gentile da Fabriano, *Flight into Egypt*,
Predella of the *Adoration of the Magi* Altarpiece,
tempera, 1423, Florence, Uffizi.



Plate 402: Gentile da Fabriano, *Presentation in the Temple*,
Predella of the *Adoration of the Magi* Altarpiece,
tempera, 1423, Paris, Louvre.

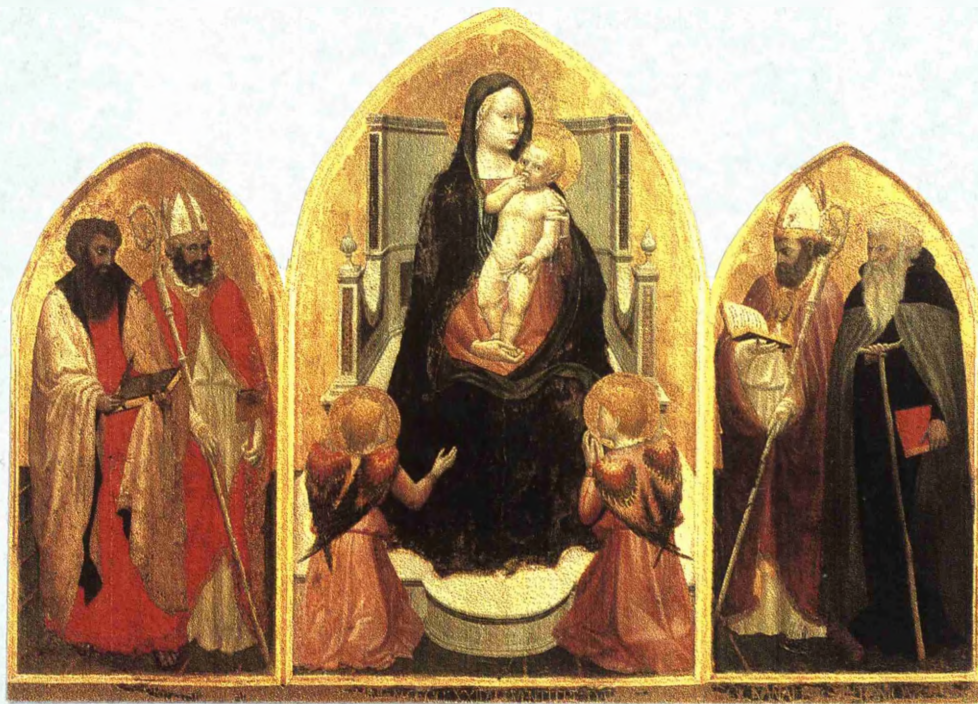


Plate 403: Masaccio, *San Giovenale Triptych*,
tempera, 1422, Cascia de Reggello, S.Pietro.



Plate 404: Masaccio, *Madonna and Child with St. Anne*,
tempera, c.1424-25, Florence, Uffizi.

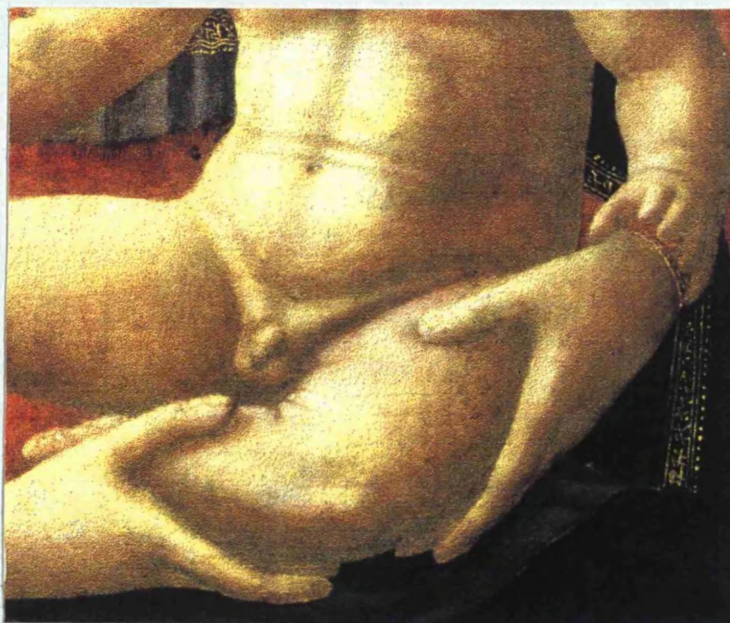


Plate 405: Masaccio, detail of *Madonna and Child with St. Anne*,
tempera, c.1424-25, Florence, Uffizi.

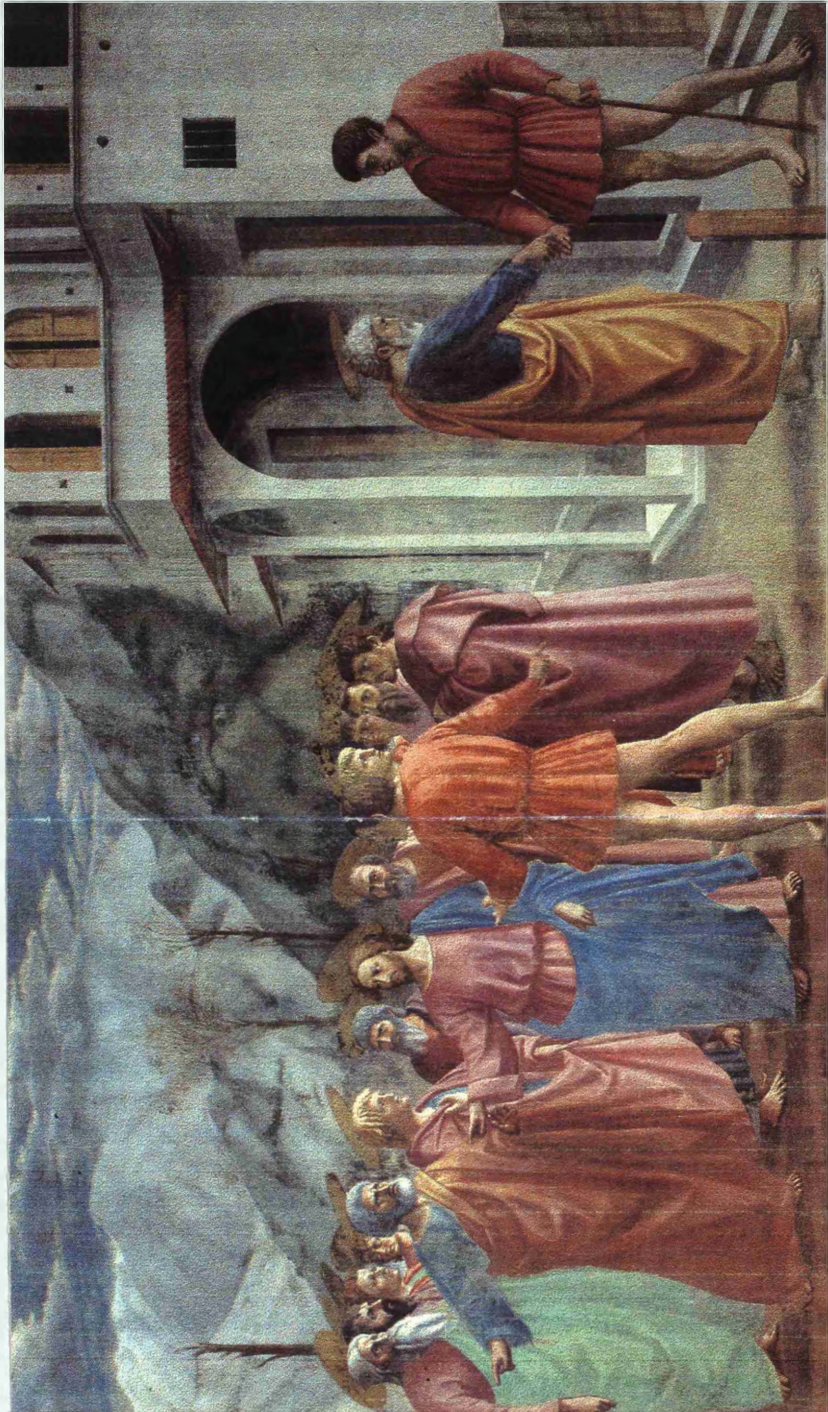


Plate 406: Masaccio, *The Tribute Money*, fresco, c.1425,
Florence, Sta Maria del Carmine, Brancacci Chapel.



Plate 407: Masaccio, detail of *The Tribute Money*, fresco, c.1425, Florence, Sta.Maria del Carmine, Brancacci Chapel.

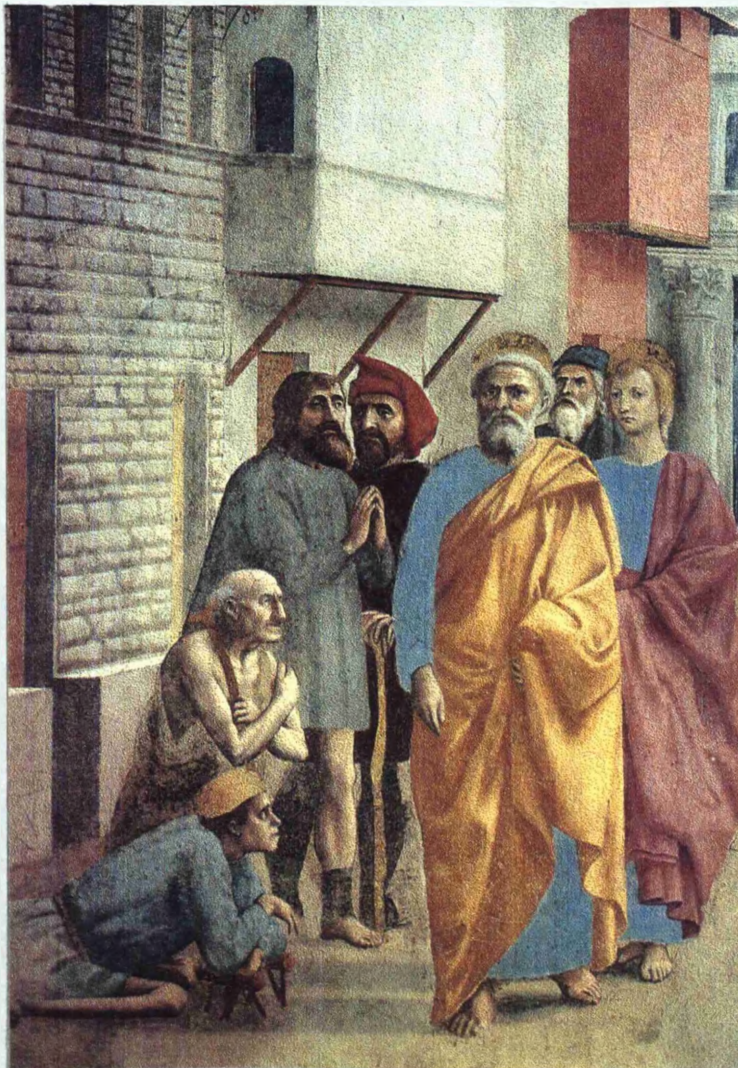


Plate 408: Masaccio, *St.Peter Healing the Sick by his Shadow*, fresco, c.1426, Florence, Sta.Maria del Carmine, Brancacci Chapel.



Plate 409: Masaccio, *Enthroned Madonna with Child and Angels*,
centre panel of the Pisa Polyptych, tempera, 1426,
London, National Gallery.

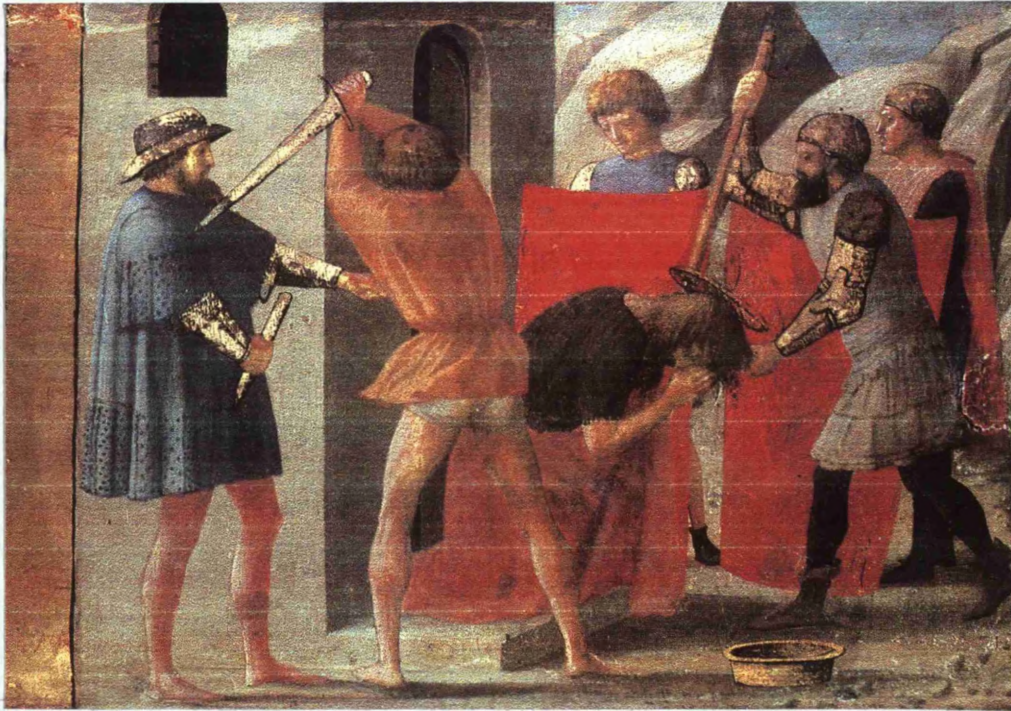


Plate 410: Masaccio, *Martyrdom of St. John the Baptist*, detail from the predella of the Pisa Polyptych, tempera, 1426, Berlin, Staatliche Museum.



Plate 411: Fra Angelico, *Virgin and Child Enthroned with Eight Angels*,
centre panel of altarpiece, tempera, c.1425,
Fiesole, S.Domenico



Plate 412: Robert Campin, *A Woman*, c.1430,
London, National Gallery.



Plate 412: Robert Campin, *A Woman*, c.1430,
London, National Gallery.



Plate 413: Jan van Eyck, *Cardinal Niccolò Albergati / Bishop of Winchester*, 1432, Vienna, Kunsthistorisches Museum.



Plate 414: Jan van Eyck, *The Arnolfini Wedding*, 1434,
London, National Gallery.

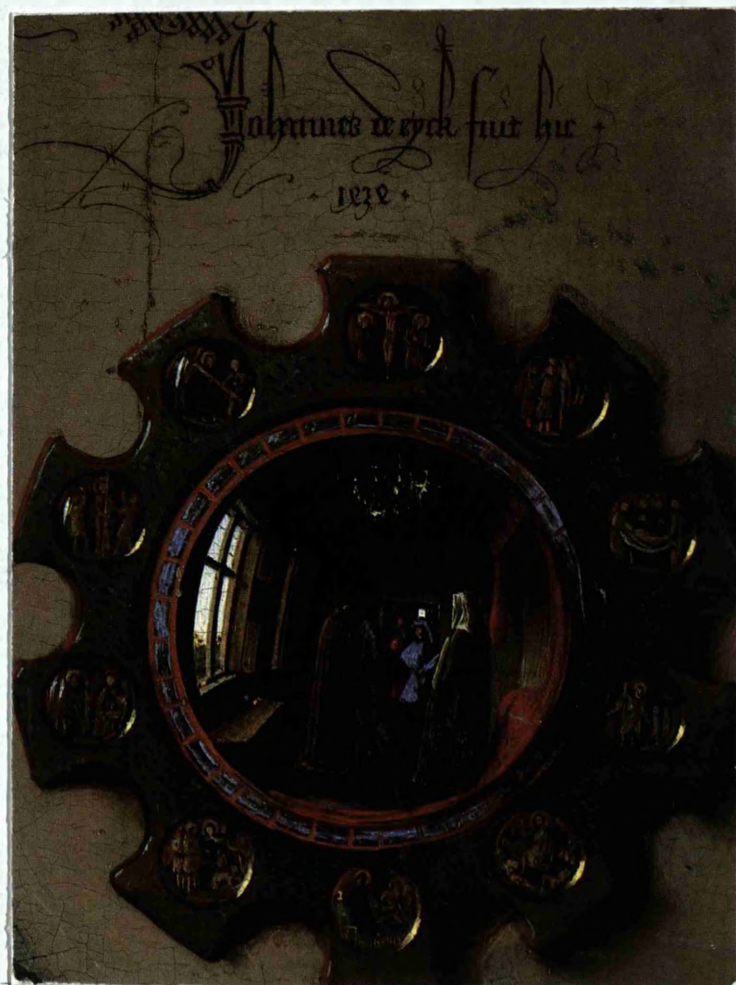


Plate 415: Jan van Eyck, *Mirror*, detail of *The Arnolfini Wedding*, 1434, London, National Gallery.



Plate 416: Jan van Eyck, *Jan Arnolfini*, detail of *The Arnolfini Wedding*, 1434, London, National Gallery.

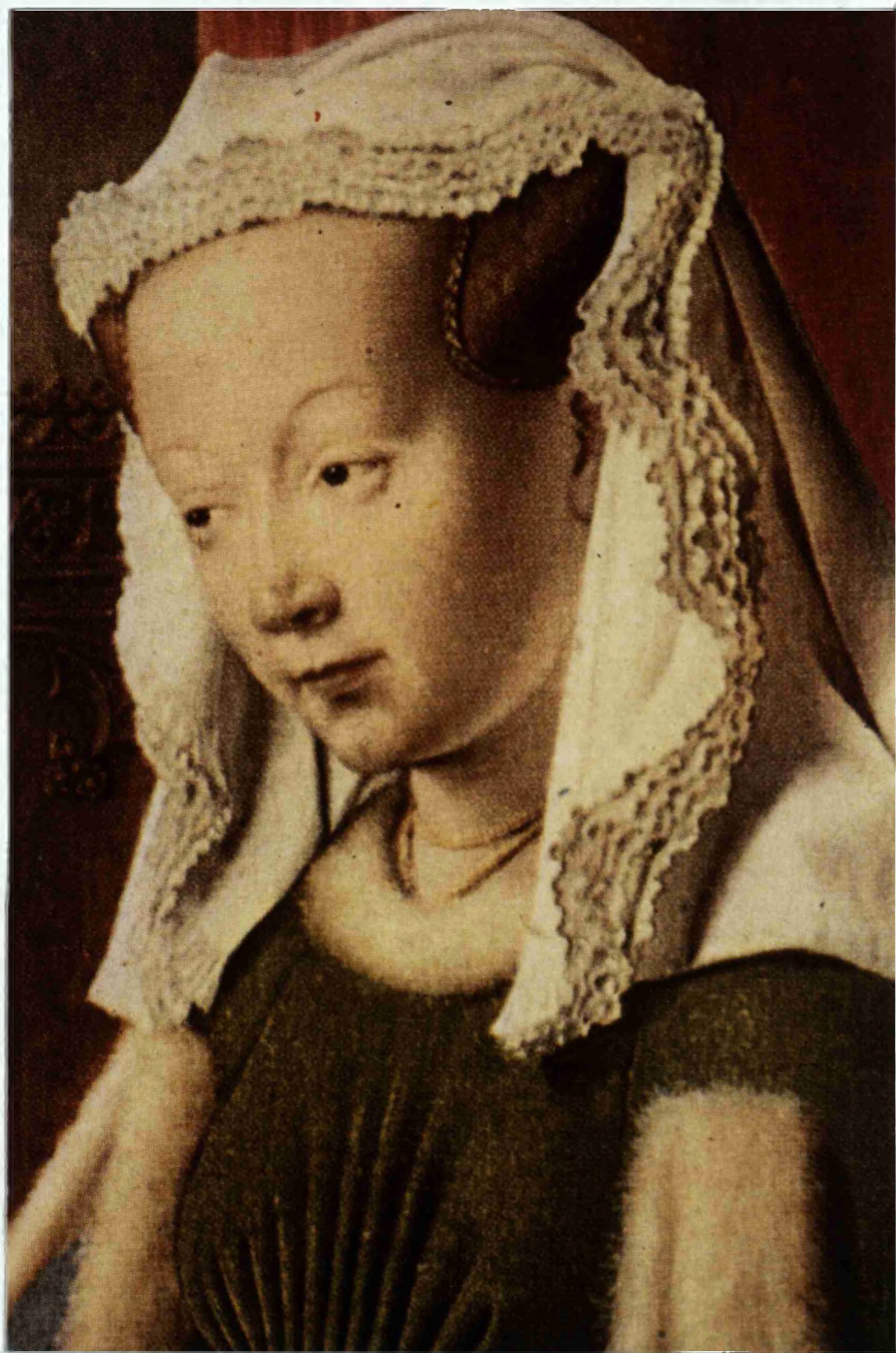


Plate 417: Jan van Eyck, *Giovanna Arnolfini*,
detail of *The Arnolfini Wedding*, 1434,
London, National Gallery.



Plate 418: Filippo Lippi, detail of the *Tarquinia Madonna*, 1437,
Rome Palazzo Barberini.



Plate 419: Sassetta, *Stigmatisation of St Francis*,
tempera, 1437-44, London, National Gallery.