

Painting and Experience in Fifteenth Century Italy

**A PRIMER IN THE SOCIAL HISTORY
OF PICTORIAL STYLE**

MICHAEL BAXANDALL

CLARENDON PRESS · OXFORD
1972

Oxford University Press, Ely House, London W. 1

GLASGOW NEW YORK TORONTO MELBOURNE WELLINGTON
CAPE TOWN IBADAN NAIROBI DAR ES SALAAM LISAKA ADDIS ABABA
DELHI BOMBAY CALCUTTA MADRAS KARACHI LAHORE DACCA
KUALA LUMPUR SINGAPORE HONG KONG TOKYO

© OXFORD UNIVERSITY PRESS 1972

AA
ND

615

B32,

PHOTOSET AND
PRINTED IN GREAT BRITAIN
BY BAS PRINTERS LIMITED
WALLOP HAMPSHIRE

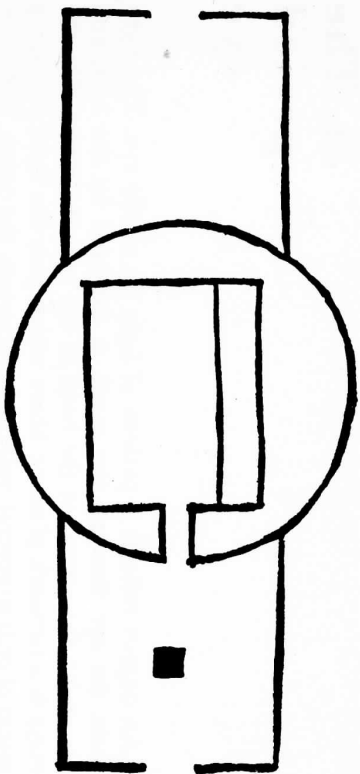
COLOUR PLATES BY
COLOUR REPRODUCTIONS LTD., BILLERICAY, ESSEX

II. The period eye

1. An object reflects a pattern of light on to the eye. The light enters the eye through the pupil, is gathered by the lens, and thrown on the screen at the back of the eye, the retina. On the retina is a network of nerve fibres which pass the light through a system of cells to several millions of receptors, the cones. The cones are sensitive both to light and to colour, and they respond by carrying information about light and colour to the brain.

It is at this point that human equipment for visual perception ceases to be uniform, from one man to the next. The brain must interpret the raw data about light and colour that it receives from the cones and it does this with innate skills and those developed out of experience. It tries out relevant items from its stock of patterns, categories, habits of inference and analogy—'round', 'grey', 'smooth', 'pebble' would be verbalized examples—and these lend the fantastically complex ocular data a structure and therefore a meaning. This is done at the cost of a certain simplification and distortion: the relative aptness of the category 'round' overlays a more complex reality. But each of us has had different experience, and so each of us has slightly different knowledge and skills of interpretation. Everyone, in fact, processes the data from the eye with different equipment. In practice these differences are quite small, since most experience is common to us all: we all recognize our own species and its limbs, judge distance and elevation, infer and assess movement, and many other things. Yet in some circumstances the otherwise marginal differences between one man and another can take on a curious prominence.

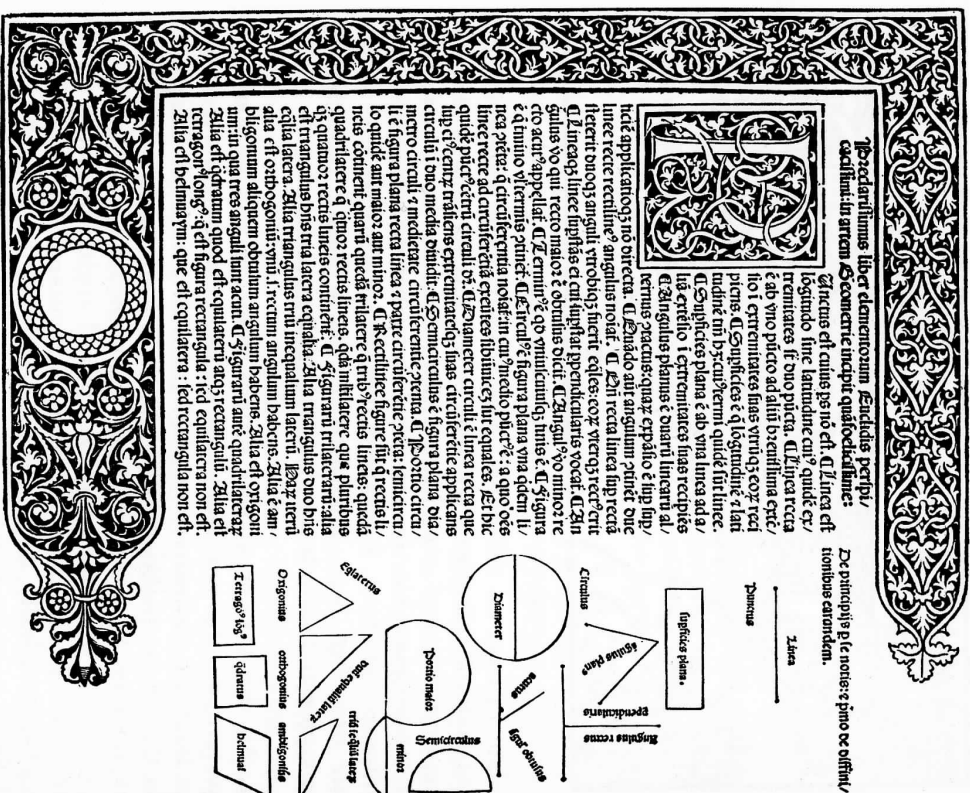
Suppose a man is shown the configuration in plate 13, a configuration that can be apprehended in various ways. One way would be primarily as a round thing with a pair of elongated L-shaped projections on each side. Another way would be primarily as a circular form superimposed on a broken rectangular form. There are many other ways of perceiving it as well. That which we tend toward will depend on many things—particularly on the context of the configuration, which is suppressed here for the moment—but not least on the interpreting



13. Santo Brasca. *Itinerario* . . . di Gerusalemme (Milan, 1481). p. 58 v. Woodcut.

skills one happens to possess, the categories, the model patterns and the habits of inference and analogy: in short, what we may call one's *cognitive style*. Suppose the man looking at plate 13 is well equipped with patterns and concepts of shape like those in plate 14 and is practised in using them. (In fact, most of the people plate 13 was originally made for were proud of being so equipped.) This man will be disposed to the second of the ways of perceiving the configuration. He will be less likely to see it just as a round thing with projections, and more likely to see it primarily as a circle superimposed on a rectangle: he possesses these categories and is practised at distinguishing such patterns in complicated shapes. To this extent he will *see* plate 13 differently from a man without resources of this kind.

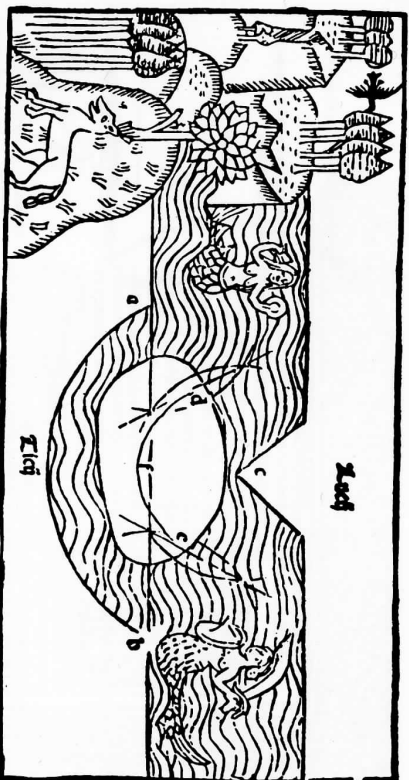
Let us now add a context to plate 13. It occurs in a description of the Holy Land printed in Milan in 1481 and it has the caption: 'Questo e la forma del sancto sepulchro de meser iesu christo.' (This is the shape of the Holy Sepulchre of Our Lord Jesus Christ). The context adds two particularly important factors to the perception of the configuration. First, one now knows that it has been made with the purpose of representing something: the man looking at it refers to his experience of representational conventions and is likely to decide that it belongs to the ground-plan convention—lines representing the course walls would follow on the ground if one were looking vertically down at a structure. The groundplan is a relatively abstract and analytical convention for representing things, and unless it is within his culture—as it is within ours—the man may be puzzled as to how to interpret the figure. Second, one has been cued to the fact that prior



14. Euclid. *Elementa geometriae* (Venice, 1482). p. 2 r. Woodcut.

experience of buildings is relevant here, and one will make inferences accordingly. A man used to fifteenth-century Italian architecture might well infer that the circle is a circular building, with a cupola perhaps, and that the rectangular wings are halls. But a fifteenth-century Chinese, once he had learned the ground-plan convention, might infer a circular central court on the lines of the new Temple of Heaven at Peking.

So here are three variable and indeed culturally relative kinds of thing the mind brings to interpreting the pattern of light



15. Bartolo da Sassoferrato. *De luminibus* (Rome, 1483). p. 18 r. Woodcut.

plate 13 casts on the retina: a stock of patterns, categories and methods of inference; training in a range of representational conventions; and experience, drawn from the environment, in what are plausible ways of visualizing what we have incomplete information about. In practice they do not work serially, as they are described here, but together; the process is indescribably complex and still obscure in its physiological detail.

2. All this may seem very distant from the way we look at a picture, but it is not. Plate 15 is the representation of a river and at least two distinct representational conventions are being used in it. The mermaids and the miniature landscape on the left are represented by lines indicating the contours of forms, and the point of view is from a slightly upward angle. The course of the river and the dynamics of its flow are registered diagrammatically and geometrically, and the point of view is from vertically above. A linear ripple convention on the water surface mediates between one style of representation and the other. The first convention is more immediately related to what we see, where the second is more abstract and conceptualized—and to us now rather unfamiliar—but they both involve a skill and a willingness to interpret marks on paper as representations simplifying an aspect of reality within accepted rules: we do not *see* a tree as a white plane surface circumscribed by black lines. Yet the tree is only a crude version of what one has in a picture, and the variable pressures on perception, the cognitive style, also operate on anyone's perception of a painting.

We will take Piero della Francesca's *Annunciation* fresco at

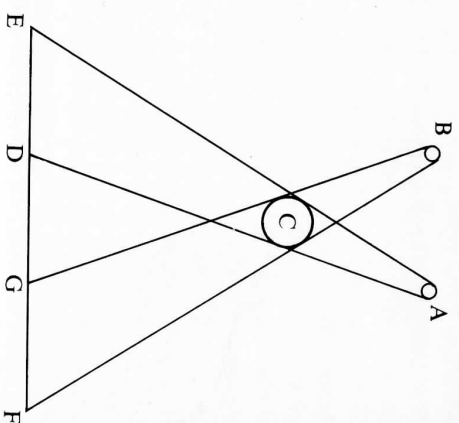
Arezzo (Colour Plate I) as an example. In the first place, understanding the picture depends on acknowledging a representational convention, of which the central part is that a man is disposing pigments on a two-dimensional ground in order to refer to something that is three-dimensional: one must enter into the spirit of the game, which is not the groundplan game but something Boccaccio described very well:

The painter exerts himself to make any figure he paints—actually just a little colour applied with skill to a panel—similar in its action to a figure which is the product of Nature and naturally has that action: so that it can deceive the eyes of the beholder, either partly or completely, making itself be taken for what it really is not.

In fact, since our vision is stereoscopic, one is not normally long deceived by such a picture to the point of completely supposing it real. Leonardo da Vinci pointed this out:

It is not possible for a painting, even if it is done with the greatest perfection of outline, shadow, light and colour, to appear in the same relief as the natural model, unless that natural model were looked at from a great distance and with only one eye.

He adds a drawing (plate 16) to demonstrate why this is so: A and B are our eyes, C the object seen, E-F space behind it, D-G the area screened by a painted object, but in real life seen. But the convention was that the painter made his flat surface very suggestive of a three-dimensional world and was given credit for doing so. Looking at such representations was a fifteenth-century Italian institution, and involved in the institution were certain expectations; these varied according to the



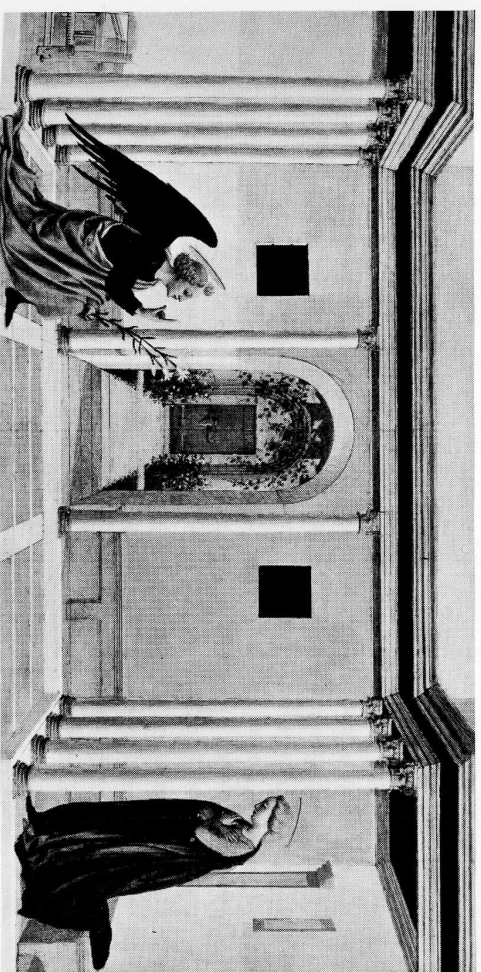
16. After Leonardo da Vinci. Stereoscopic vision. From *Libro di pittura*, Vatican Library, MS. Urb. lat. 1270, fol. 155 v.

placing of the picture—church or *salone*—but one expectation was constant: the beholder expected *skill*, as we have seen. Quite what sort of skill he expected will occupy us presently, but the point to be noticed now is that a fifteenth-century man looking at a picture was curiously on his mettle. He was aware that the good picture embodied skill and he was frequently assured that it was the part of the cultivated beholder to make discriminations about that skill, and sometimes even to do so verbally. The most popular fifteenth-century treatise on education, for example, Pier Paolo Vergerio's *On noble behaviour* of 1404, reminded him: 'The beauty and grace of objects, both natural ones and those made by man's art, are things it is proper for men of distinction to be able to discuss with each other and appreciate.' Looking at Piero's painting, a man with intellectual self-respect was in no position to remain quite passive; he was obliged to discriminate.

This brings us to the second point, which is that the picture is sensitive to the kinds of interpretative skill—patterns, categories, inferences, analogies—the mind brings to it. A man's capacity to distinguish a certain kind of form or relationship of forms will have consequences for the attention with which he addresses a picture. For instance, if he is skilled in noting proportional relationships, or if he is practiced in reducing complex forms to compounds of simple forms, or if he has a rich set of categories for different kinds of red and brown, these skills may well lead him to order his experience of Piero della Francesca's *Annunciation* differently from people without these skills, and much more sharply than people whose experience has not given them many skills relevant to the picture. For it is clear that some perceptual skills are more relevant to any one picture than others: a virtuosity in classifying the ductus of flexing lines—a skill many Germans, for instance, possessed in this period—or a functional knowledge of the surface musculature of the human body would not find much scope on the *Annunciation*. Much of what we call 'taste' lies in this, the conformity between discriminations demanded by a painting and skills of discrimination possessed by the beholder. We enjoy our own exercise of skill, and we particularly enjoy the playful exercise of skills which we use in normal life very earnestly. If a painting gives us opportunity for exercising a valued skill and rewards our virtuosity with a sense of worthwhile insights about that painting's organization, we tend to enjoy it: it is to our taste. The negative of this is the man without the sorts of skill in terms of which the painting is ordered: a German calligrapher confronted by a Piero della Francesca, perhaps.

Thirdly again, one brings to the picture a mass of information and assumptions drawn from general experience. Our own culture is close enough to the Quattrocento for us to take a lot of the same things for granted and not to have a strong sense of misunderstanding the pictures: we are closer to the Quattrocento mind than to the Byzantine, for instance. This can make it difficult to realize how much of our comprehension depends on 'what we bring to the picture. To take two contrasting kinds of such knowledge, if one could remove from one's perception of Piero della Francesca's *Annunciation* both (a) the assumption that the building units are likely to be rectangular and regular, and (b) knowledge of the Annunciation story, one would have difficulty in making it out. For the first, in spite of Piero's rigorous perspective construction—itsself a mode of representation the fifteenth-century Chinese would have had problems with—the logic of the picture depends heavily on our assumption that the loggia projects at a right angle from the back wall: suppress this assumption and one is thrown into uncertainty about the whole spatial layout of the scene. Perhaps the loggia is shallower than one thought, its ceiling sloping down backwards and its corner thrusting out towards the left in an acute angle, then the tiles of the pavement will be lozenges, not oblongs . . . and so on. A clearer case: remove the assumption of regularity and rectangularity from the loggia architecture of Domenico Veneziano's *Annunciation* (plate 17)—refuse to take for granted either that the

17. Domenico Veneziano. *The Annunciation* (about 1445). Cambridge, Fitzwilliam Museum. Panel.



walls of the courtyard meet at right angles or that the fore-shortened rows of columns are spaced at the same intervals as the row seen face on—and the picture space abruptly telescopes into a shallow little area.

Regarding knowledge of the story, if one did not know about the Annunciation it would be difficult to know quite what was happening in Piero's painting; as a critic once pointed out, if all Christian knowledge were lost, a person could well suppose that both figures, the Angel Gabriel and Mary, were directing some sort of devout attention to the column. This does not mean that Piero was telling his story badly; it means he could depend on the beholder to recognize the Annunciation subject promptly enough for him to accent, vary and adjust it in rather advanced ways. In this case, Mary's stance frontal to us serves various purposes: first, it is a device Piero uses to induce participation by the beholder; second, it counters on this occasion the fact that its position in the chapel at Arezzo causes the beholder to see the fresco rather from the right; third, it helps to register a particular moment in Mary's story, a moment of reserve towards the Angel previous to her final submission to her destiny. For fifteenth-century people differentiated more sharply than us between successive stages of the Annunciation, and the sort of nuance we now miss in Quattrocento representations of the Annunciation is one of the things that will have to engage us later.

3. Renaissance people were, as has been said, on their mettle before a picture, because of an expectation that cultivated people should be able to make discriminations about the interest of pictures. These very often took the form of a preoccupation with the painter's skill, and we have seen too that this preoccupation was something firmly anchored in certain economic and intellectual conventions and assumptions. But the only practical way of publicly making discriminations is verbally: the Renaissance beholder was a man under some pressure to have words that fitted the interest of the object. The occasion might be one when actual enunciation of words was appropriate, or it might be one when internal possession of suitable categories assured him of his own competence in relation to the picture. In any event, at some fairly high level of consciousness the Renaissance man was one who matched concepts with pictorial style.

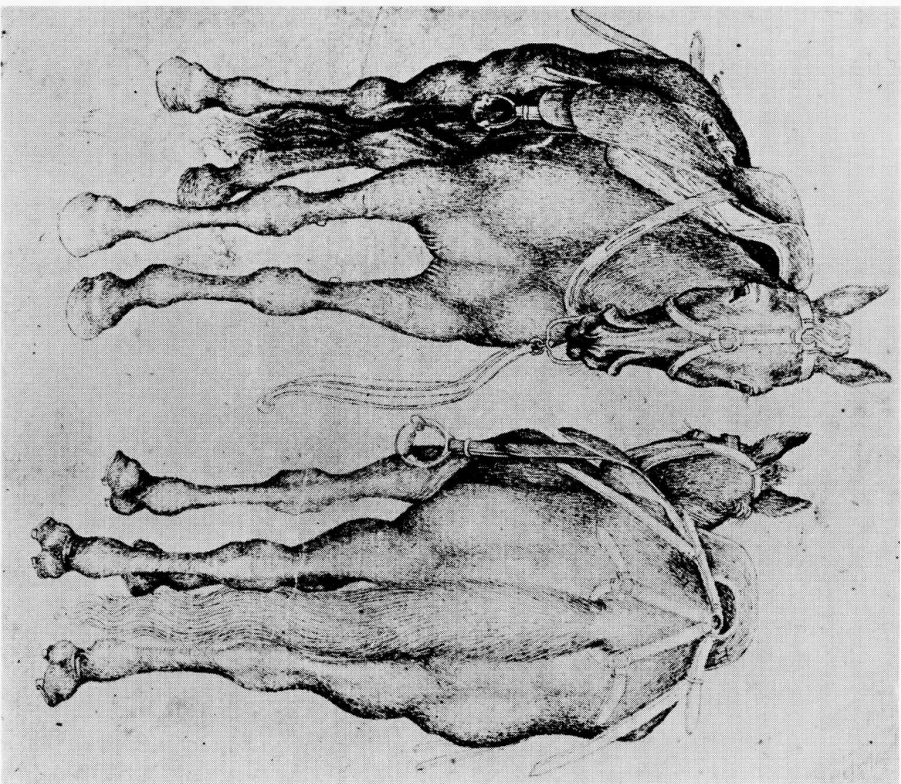
This is one of the things that makes the kind of culturally relative pressures on perception we have been discussing so very important for Renaissance perception of pictures. In our own

culture there is a class of over-cultivated person who, though he is not a painter himself, has learned quite an extensive range of specialized categories of pictorial interest, a set of words and concepts specific to the quality of paintings: he can talk of 'tactile values', or of 'diversified images'. In the fifteenth century there were some such people, but they had relatively few special concepts, if only because there was then such a small literature of art. Most of the people the painter catered for had half-a-dozen or so such categories for the quality of pictures—'fore-shortening', 'ultramarine at two florins an ounce', 'drapery' perhaps, and a few others we shall be meeting—and then were thrown back on their more general resources.

Like most of us now, his real training in consciously precise and complex visual assessment of objects, 'both natural ones and those made by man's art', was not on paintings but on things more immediate to his well-being and social survival:

The beauty of the horse is to be recognized above all in its having a body so broad and long that its members correspond in a regular fashion with its breadth and length (plates 18-19). The head of the horse should be proportionately slender, thin and long. The mouth wide and sharply cut; the nostrils broad and distended. The eyes should not be hollowed nor deeply recessed; the ears should be small and carried like spears; the neck long and rather slender towards the head, the jaw quite slender and thin, the mane sparse and straight. The chest should be broad and fairly round, the thighs not tapering but rather straight and even, the croup short and quite flat, the loins round and rather thick, the ribs and other like parts also thick, the haunches long and even, the crupper long and wide. . . . The horse should be taller before than behind, to the same degree a deer is, and should carry its head high, and the thickness of its neck should be proportionable with its chest. Anyone who wants to be a judge of horses' beauty must consider all the parts of the horse discussed above as parts related in proportion to the height and breadth of the horse. . . .

But there is a distinction to be made between the general run of visual skills and a preferred class of skills specially relevant to the perception of works of art. The skills we are most aware of are not the ones we have absorbed like everyone else in infancy, but those we have learned formally, with conscious effort: those which we have been taught. And here in turn there is a correlation with skills that can be talked about. Taught skills commonly have rules and categories, a terminology and stated standards, which are the medium through which they are teachable. These two things—the confidence in a relatively advanced



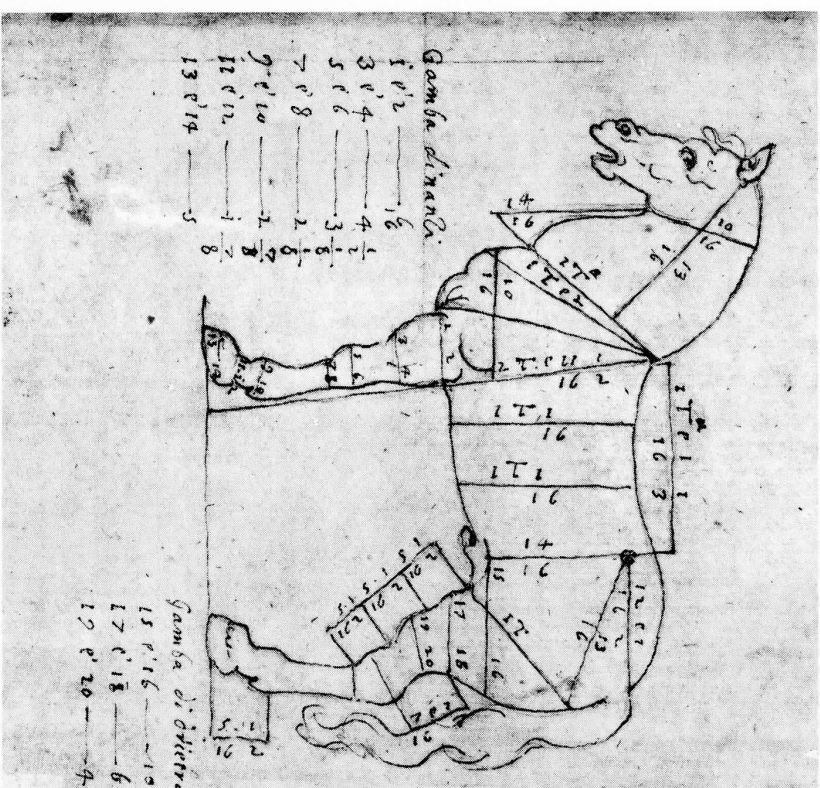
18. Pisanello. *Studies of a Horse* (Cod. Vallardi 2468). Paris, Louvre. Pen and chalk.

and valued skill, and the availability of verbal resources associated with them—make such skills particularly susceptible to transfer in situations such as that of a man in front of a picture.

This raises a problem. We have been moving towards a notion of a Quattrocento cognitive style. By this one would mean the equipment that the fifteenth-century painter's public brought to complex visual stimulations like pictures. One is talking not about all fifteenth-century people, but about those whose response to works of art was important to the artist—the patronizing classes, one might say. In effect this means rather a small proportion of the population: mercantile and professional men, acting as

members of confraternities or as individuals, princes and their courtiers, the senior members of religious houses. The peasants and the urban poor play a very small part in the Renaissance culture that most interests us now, which may be deplorable but is a fact that must be accepted. Yet among the patronizing classes there were variations, not just the inevitable variation from man to man, but variation by groups. So a certain profession, for instance, leads a man to discriminate particularly efficiently in identifiable areas. Fifteenth-century medicine trained a physician to observe the relations of member to member of the human body as a means to diagnosis, and a doctor was alert and equipped to notice matters of proportion in painting too. But while it is clear that among the painter's public there were many

19. After Leonardo da Vinci. *Dimensions of a horse*. New York, Pierpont Morgan Library, MS. M.A., 1139, fol. 82 r. Pen and chalk.



subgroups with special visual skills and habits—the painters themselves were one such subgroup—this book will be concerned with more generally accessible styles of discrimination. A Quattrocento man handled affairs, went to church, led a social life; from all of these activities he acquired skills relevant to his observation of painting. It is true that one man would be stronger on business skills, another on pious skills, another on polite skills; but every man had something of each of these, whatever the individual balance, and it is the highest common factor of skill in his public that the painter consistently catered for.

To sum up: some of the mental equipment a man orders his visual experience with is variable, and much of this variable equipment is culturally relative, in the sense of being determined by the society which has influenced his experience. Among these variables are categories with which he classifies his visual stimuli, the knowledge he will use to supplement what his immediate vision gives him, and the attitude he will adopt to the kind of artificial object seen. The beholder must use on the painting such visual skills as he has, very few of which are normally special to painting, and he is likely to use those skills his society esteems highly. The painter responds to this; his public's visual capacity must be his medium. Whatever his own specialized professional skills, he is himself a member of the society he works for and shares its visual experience and habit.

We are concerned here with Quattrocento cognitive style as it relates to Quattrocento pictorial style. This chapter must now exemplify the kinds of visual skill a Quattrocento person was distinctively equipped with, and try to show how these were relevant to painting.

4. Most fifteenth-century pictures are religious pictures. This is self-evident, in one sense, but 'religious pictures' refers to more than just a certain range of subject matter; it means that the pictures existed to meet institutional ends, to help with specific intellectual and spiritual activities. It also means that the pictures came within the jurisdiction of a mature body of ecclesiastical theory about images. There is no sign of the more academic elaborations of this theory being active in many people's minds during the fifteenth century, though they were quite often rehearsed by the theologians, but a few of the basic principles still set standards for the pictures much more real for the public mind than some of the artistic theory we make so much of now.

What was the religious function of religious pictures? In the

Church's view the purpose of images was threefold. John of Genoa's late thirteenth-century *Catholicon*, still a standard dictionary of the period, summarized them in this way:

Know that there were three reasons for the institution of images in churches. *First*, for the instruction of simple people, because they are instructed by them as if by books. *Second*, so that the mystery of the incarnation and the examples of the Saints may be the more active in our memory through being presented daily to our eyes. *Third*, to excite feelings of devotion, these being aroused more effectively by things seen than by things heard.

In a sermon published in 1492 the Dominican Fra Michele da Carcano gives an orthodox Quattrocento expansion of this:

... images of the Virgin and the Saints were introduced for three reasons. *First*, on account of the ignorance of simple people, so that those who are not able to read the scriptures can yet learn by seeing the sacraments of our salvation and faith in pictures. It is written: 'I have learned that, inflamed by unconsidered zeal, you have been destroying the images of the saints on the grounds that they should not be adored. And we praise you wholeheartedly for not allowing them to be adored, but we blame you for breaking them ... For it is one thing to adore a painting, but it is quite another to learn from a painted narrative what to adore. What a book is to those who can read, a picture is to the ignorant people who look at it. Because in a picture even the unlearned may see what example they should follow; in a picture they who know no letters may yet read.' St. Gregory the Great wrote these words to Serenus, Bishop of Marselles. *Second*, images were introduced on account of our emotional sluggishness; so that men who are not aroused to devotion when they hear about the histories of the Saints may at least be moved when they see them, as if actually present, in pictures. For our feelings are aroused by things seen more than by things heard. *Third*, they were introduced on account of our unreliable memories ... Images were introduced because many people cannot retain in their memories what they hear, but they do remember if they see images.

If you commute these three reasons for images into instructions for the beholder, it amounts to using pictures as respectively lucid, vivid and readily accessible stimuli to meditation on the Bible and the lives of Saints. If you convert them into a brief for the painter, they carry an expectation that the picture should tell its story in a clear way for the simple and in an eye-catching and memorable way for the forgetful, and with full use of all the emotional resources of the sense of sight, the most powerful as well as the most precise of the senses.

Of course, the matter could not always be as simple and as

rational as this; there were abuses both in people's responses to pictures and in the way the pictures themselves were made. Idolatry was a standing preoccupation of theology: it was fully realized that simple people could easily confuse the image of divinity or sanctity with divinity or sanctity itself, and worship it. There were widely reported phenomena that tended to go with irrational responses to the images; a story in Siconolfi's *Life of St. Anthony of Padua* printed in 1476:

Pope Boniface VIII . . . had the old and ruinous Basilica of St. John Lateran at Rome rebuilt and redecorated with much care and expense, and he listed by name which saints were to be depicted in it. The painters of the Order of Minor Friars were preeminent in this art and there were two particularly good masters from this Order. When these two had painted up all the saints the Pope had ordered, on their own initiative they added in a blank space pictures of Sts. Francis and Anthony. When the Pope heard about this he was angered by their disrespect of his orders. 'I can tolerate the St. Francis,' he said, 'as it is now done. But I insist on the St. Anthony being removed completely.' However all the people sent by the Pope to carry out this command were thrown down to the ground, fiercely knocked about and driven away by a terrible, resounding, gigantic spirit. When the Pope heard of this, he said: 'Let the St. Anthony alone, then, since we can see he wants to stay; in conflict with him, we can only lose more than we gain.'

But idolatry never became as publicly scandalous and pressing a problem as it did in Germany; it was an abuse on which theologians regularly discoursed, but in a stereotyped and rather unhelpful way. Lay opinion usually felt able to dismiss it as an abuse of pictures that did not constitute a condemnation of the institution of images itself; as the humanist Chancellor of Florence Coluccio Salutati had described it:

I think [an ancient Roman's] feelings about their religious images were no different from what we in the full rectitude of our faith feel now about the painted or carved memorials of our Saints and Martyrs. For we perceive these not as Saints and as Gods but rather as images of God and the Saints. It may indeed be that the ignorant vulgar think more and otherwise of them than they should. But one enters into understanding and knowledge of spiritual things through the medium of sensible things, and so if pagan people made images of Fortune with a cornucopia and a rudder—as distributing wealth and controlling human affairs—they did not deviate very much from the truth. So too, when our own artists represent Fortune as a queen turning with her hands a revolving wheel, so long as we apprehend that picture as something made by a man's hand, not something itself divine but a similitude of divine providence, direction and order—and representing indeed not

its essential character but rather the winding and turning of mundane affairs—who can reasonably complain?

The abuse was agreed to exist in some measure but did not stimulate churchmen to new thoughts or action on the problem.

As for the pictures themselves, the Church realized there were sometimes faults against theology and good taste in their conception. S. Antonino, Archbishop of Florence, sums up the three main errors:

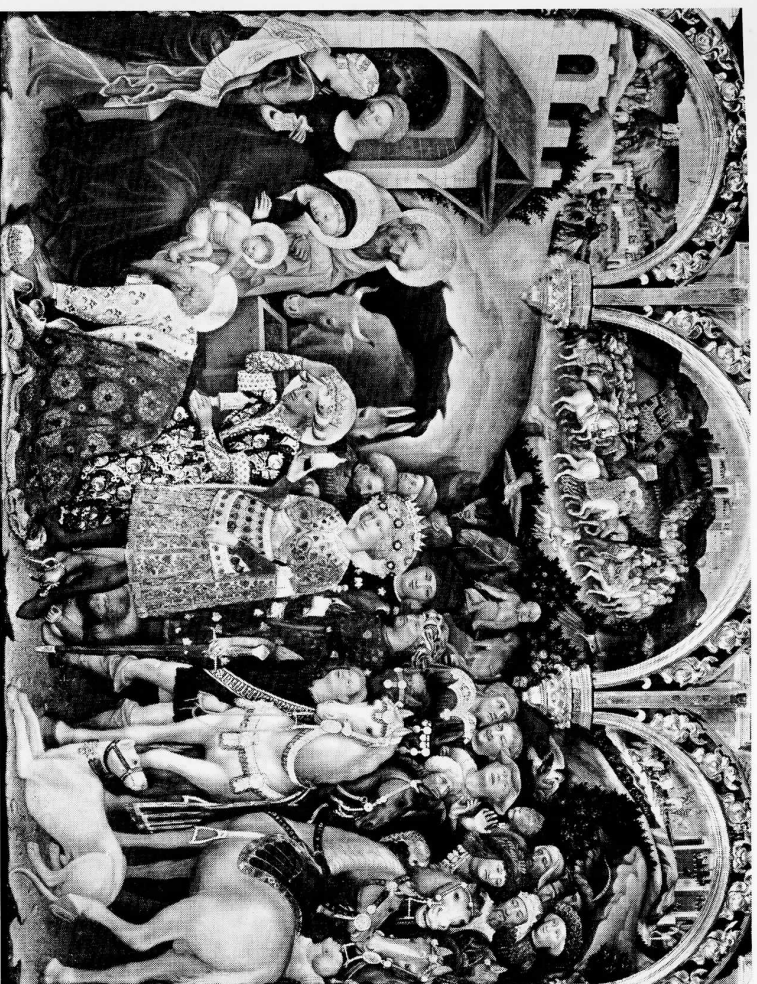
Painters are to be blamed when they paint things contrary to our Faith—when they represent the Trinity as one person with three heads, a monster; or when, in the Annunciation, they represent a small infant, Jesus, in the Virgin's womb, as if the body he took on were not of her substance; or when they paint the infant Jesus with a hornbook, even though he never learned from man. But they are not to be praised either when they paint apocryphal matter, like midwives at the Nativity, or the Virgin Mary in her Assumption handing down her girdle to St. Thomas on account of his doubt (plate 20), and so on. Also, to paint curiosities into the stories of Saints and in churches, things that do not serve to arouse devotion but laughter and vain thoughts—monkeys, and dogs chasing hares and so on, or gratuitously elaborate costumes—this I think unnecessary and vain.

Subjects with heretical implications, apocryphal subjects, subjects obscured by a frivolous and indecorous treatment. Again, all three of these faults did exist. Christ was erroneously shown learning to read in many paintings. The apocryphal story of St. Thomas and the Virgin's girdle was the largest sculptured decoration on S. Antonino's own cathedral church at Florence, the Porta della Mandorla, and appears in numerous paintings. Gentile da Fabriano's *Adoration of the Magi* (plate 21), painted for the Florentine merchant and humanist Palla Strozzi in 1423, has the monkeys, dogs and elaborate costumes S. Antonino considered unnecessary and vain. But, also again, the complaint is not new or particularly of its time; it is just a Quattrocento version of a stock theologian's complaint, voiced continually from St. Bernard to the Council of Trent. When S. Antonino looked at the painting of his time he might well have felt that, on the whole, the Church's three functions for painting were fulfilled: that most pictures were (1) clear, (2) attractive and memorable, (3) stirring registrations of the holy stories. If he had not, he was certainly the man to say so.

So the first question—What was the religious function of religious paintings?—can be reformulated, or at least replaced by a new question: What sort of painting would the religious



20. Matteo di Giovanni. *The Assumption of the Virgin* (1474). London, National Gallery. Panel.



21. Gentile da Fabriano. *The Adoration of the Magi* (1423). Florence, Uffizi. Panel.

public for pictures have found lucid, vividly memorable, and emotionally moving?

5. The painter was a professional visualizer of the holy stories. What we now easily forget is that each of his pious public was liable to be an amateur in the same line, practised in spiritual exercises that demanded a high level of visualization of, at least, the central episodes of the lives of Christ and Mary. To adapt a theological distinction, the painter's were exterior visualizations, the public's interior visualizations. The public mind was not a blank tablet on which the painters' representations of a story or person could impress themselves; it was an active institution of interior visualization with which every painter had to get along. In this respect the fifteenth-century experience of a painting was not the painting we see now so much as a marriage between the painting and the beholder's previous visualizing activity on the same matter.

So it is important before all else to know roughly what sort of activity this was. One handbook that is usefully explicit is the *Giardino de Oration*, the *Garden of Prayer*, written for young girls in 1454 and later printed in Venice. The book explains the need for internal representations and their place in the process of prayer:

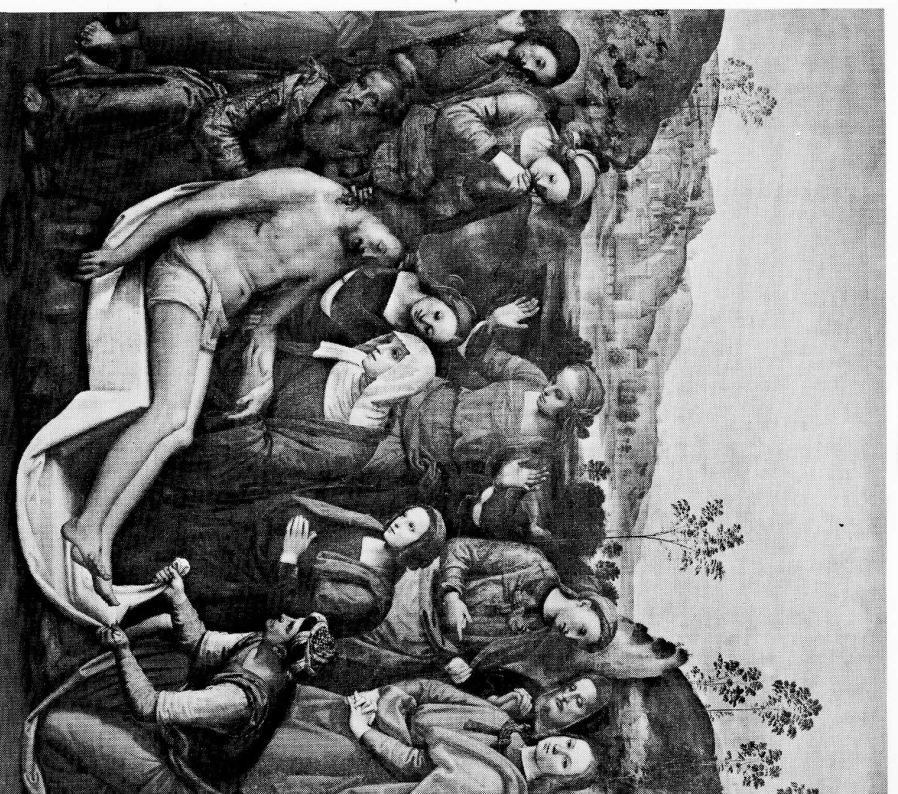
The better to impress the story of the Passion on your mind, and to memorise each action of it more easily, it is helpful and necessary to fix the places and people in your mind: a city, for example, which will be the city of Jerusalem—taking for this purpose a city that is well known to you. In this city find the principal places in which all the episodes of the Passion would have taken place—for instance, a palace with the supper-room where Christ had the Last Supper with the Disciples, and the house of Anne, and that of Caiaphas, with the place where Jesus was taken in the night, and the room where He was brought before Caiaphas and mocked and beaten. Also the residence of Pilate where he spoke with the Jews, and in it the room where Jesus was bound to the Column. Also the site of Mount Calvary, where he was put on the Cross; and other like places. . . .

And then too you must shape in your mind some people, people well-known to you, to represent for you the people involved in the Passion—the person of Jesus Himself, of the Virgin, Saint Peter, Saint John the Evangelist, Saint Mary Magdalen, Anne, Caiaphas, Pilate, Judas and the others, every one of whom you will fashion in your mind.

When you have done all this, putting all your imagination into it, then go into your chamber. Alone and solitary, excluding every external thought from your mind, start thinking of the beginning of the Passion, starting with how Jesus entered Jerusalem on the ass. Moving slowly from episode to episode, meditate on each one, dwelling on each single stage and step of the story. And if at any point you feel a sensation of piety, stop: do not pass on as long as that sweet and devout sentiment lasts. . . .

This sort of experience, a visualizing meditation on the stories particularized to the point of perhaps setting them in one's own city and casting them from one's own acquaintance, is something most of us now lack. It gave the painter's exterior visualizations a curious function.

The painter could not compete with the particularity of the private representation. When beholders might approach his painting with preconceived interior pictures of such detail, each person's different, the painter did not as a rule try to give detailed characterizations of people and places: it would have been an interference with the individual's private visualization if he had. Painters specially popular in pious circles, like Perugino (plate 22), painted people who are general, unparticularized, inter-



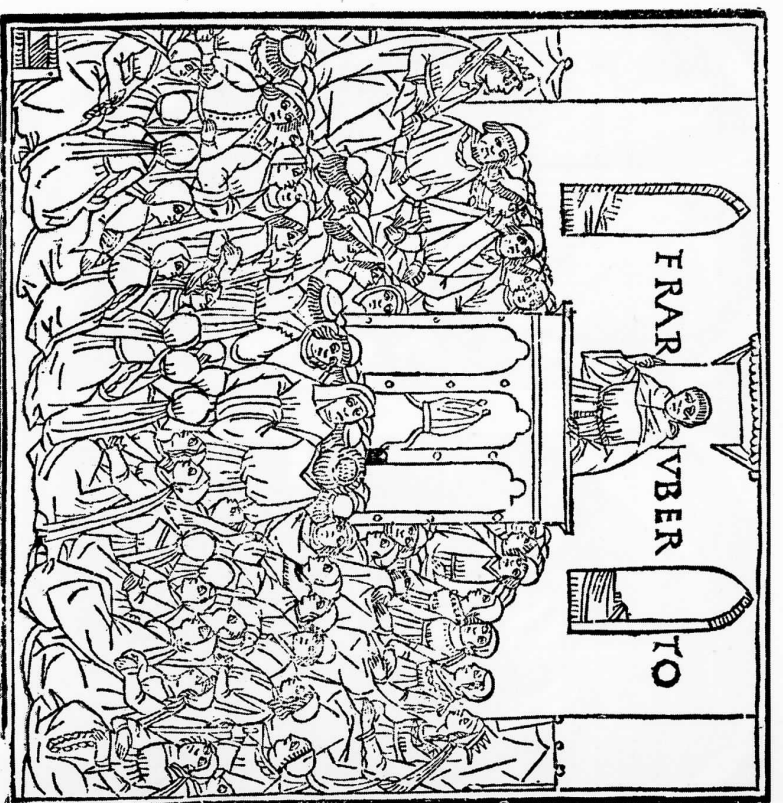
22. Perugino. *Lamentation over the Dead Christ* (1495). Florence, Palazzo Pitti. Panel.

changeable types. They provided a base—firmly concrete and very evocative in its patterns of people—on which the pious beholder could impose his personal detail, more particular but less structured than what the painter offered.

It was not only a painter like Perugino that worked within conditions of this kind, though his response to them was much appreciated. A great deal of the quality of the most central experiences of Quattrocento painting—let us say, of Masaccio's *Tribute Money* (plate 65) or Bellini's *Transfiguration* (Colour Plate II)—derives from the same situation. Bellini does not offer the detail of persons and places the public provided for itself. He complements the beholder's interior vision. His persons and places

are generalized and yet massively concrete, and they are marshalled in patterns of strong narrative suggestion. Neither of these qualities, the concrete and the patterned, are what the beholder provided for himself since you cannot provide these qualities in mental images, as a little introspection shows; neither could come fully into play before the physical sense of sight was actually resorted to. The painting is the relic of a cooperation between Bellini and his public: the fifteenth-century experience of the *Transfiguration* was an interaction between the painting, the configuration on the wall, and the visualizing activity of the public mind—a public mind with different furniture and dispositions from ours. We enjoy the *Transfiguration*, the painter's part in all this, because we are stimulated by its imbalance, its hypertrophy of the weightily concrete and eloquently patterned at the permissible expense of the particular, which Bellini could count on being contributed by the other side. We should only deceive ourselves if we thought we can have the experience of the *Transfiguration* Bellini designed, or that it expresses in any simple way a spirit or a state of mind. The best paintings often express their culture not just directly but complementarily, because it is by complementing it that they are best designed to serve public needs: the public does not need what it has already got.

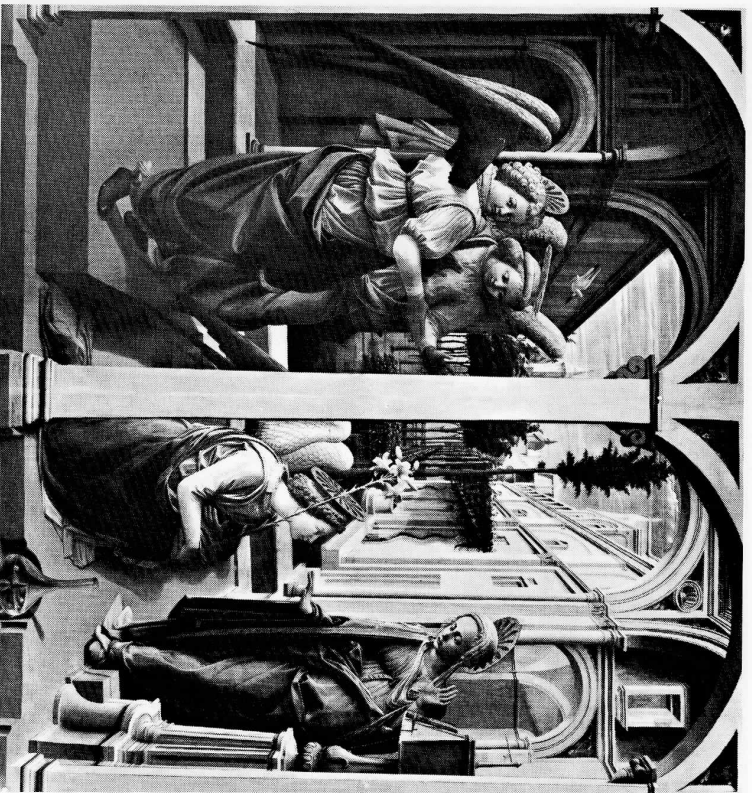
What the *Zardino de Oration* describes are private exercises in imaginative intensity and sharpness. The painter was addressing people who were publicly exercised in the same matter too, and in more formal and analytical ways. The best guide we now have to the public exercises is the sermon. Sermons were a very important part of the painter's circumstances: preacher and picture were both part of the apparatus of a church, and each took notice of the other. The fifteenth century was the last fling of the medieval type of popular preacher: the fifth Lateran Council of 1512–17 took measures to suppress them. It is one of the underlying cultural differences between the fifteenth and sixteenth centuries in Italy. The popular preachers were no doubt tasteless and inflammatory sometimes, but they filled their teaching function irreplaceably; certainly they drilled their congregations in a set of interpretative skills right at the centre of the fifteenth-century response to paintings. Fra Roberto Caracciolo da Lecce (plate 23) is a convenient example: Cosimo de' Medici thought he dressed too sharply for a priest, and his sense of the dramatic was strong—during a sermon on the Crusade he stripped off his habit to reveal, Erasmus noted with distaste, the crusader's



23. Fra Roberto Caracciolo. *Prediche vulghare* (Florence, 1491). Woodcut.

livery and armour underneath—but his sermons as we have them are decorous enough. In the course of the church year, as festival followed festival, a preacher like Fra Roberto moved over much of the painters' subject matter, explaining the meaning of events and rehearsing his hearers in the sensations of piety proper to each. *The Nativity* (Colour Plate IV) embodies mysteries of (1) humility, (2) poverty, (3) joy, each being subdivided and referred to the material details of the event. *The Visitation* (plate 38) embodies (1) benignity, (2) maternity, (3) laudability; benignity declares itself in (a) invention, Mary's act of seeking the distant Elizabeth out, (b) salutation, (c) conversation—and so on. Such sermons were a very thorough emotional categorization of the stories, closely tied to the physical, and thus also visual, embodiment of the mysteries. The preacher and painter were *repetiteurs* to each other.

To look a little more closely at one sermon, Fra Roberto preaching on the Annunciation distinguishes three principal mysteries: (1) the Angelic Mission, (2) the Angelic Salutation



24a. *The Annunciation in Florence*, 1440–60. *Disquiet*: Filippo Lippi. Florence, S. Lorenzo. Panel.

and (3) the Angelic Colloquy. Each of these is discussed under five main heads. For the Angelic Mission, Fra Roberto expounds (a) Congruity—the Angel as the proper medium between God and mortal; (b) Dignity—Gabriel being of the highest order of angels ('the painters' licence to give angels wings to signify their swift progress in all things' is here noted); (c) Clarity—the Angel manifesting itself to the corporeal vision of Mary; (d) Time—Friday 25 March, perhaps at sunrise or perhaps at midday (there are arguments for either), but certainly at the season when the earth is covering itself with grasses and flowers after the winter; (e) Place—Nazareth, meaning 'Flower', pointing to the symbolic relation of flowers to Mary. For the Angelic Salutation Fra Roberto is much briefer: the Salutation implies (a) honour, the Angel kneeling to Mary, (b) exemption from the pains of childbirth, (c) the giving of grace, (d) union with God, and (e) the unique beatitude of Mary, both Virgin and Mother.

So far what Fra Roberto has said is mainly preliminary or marginal to the painter's visual drama of Mary. It is the third mystery, the Angelic Colloquy, that throws clear light on the fifteenth-century feeling for what, on the level of human emotion, happened to her in the crisis the painter had to represent. Fra Roberto analyses the account of St. Luke (I: 26–38) and lays out a series of five successive spiritual and mental conditions or states attributable to Mary:

The third mystery of the Annunciation is called Angelic Colloquy; it comprises five Laudable Conditions of the Blessed Virgin:

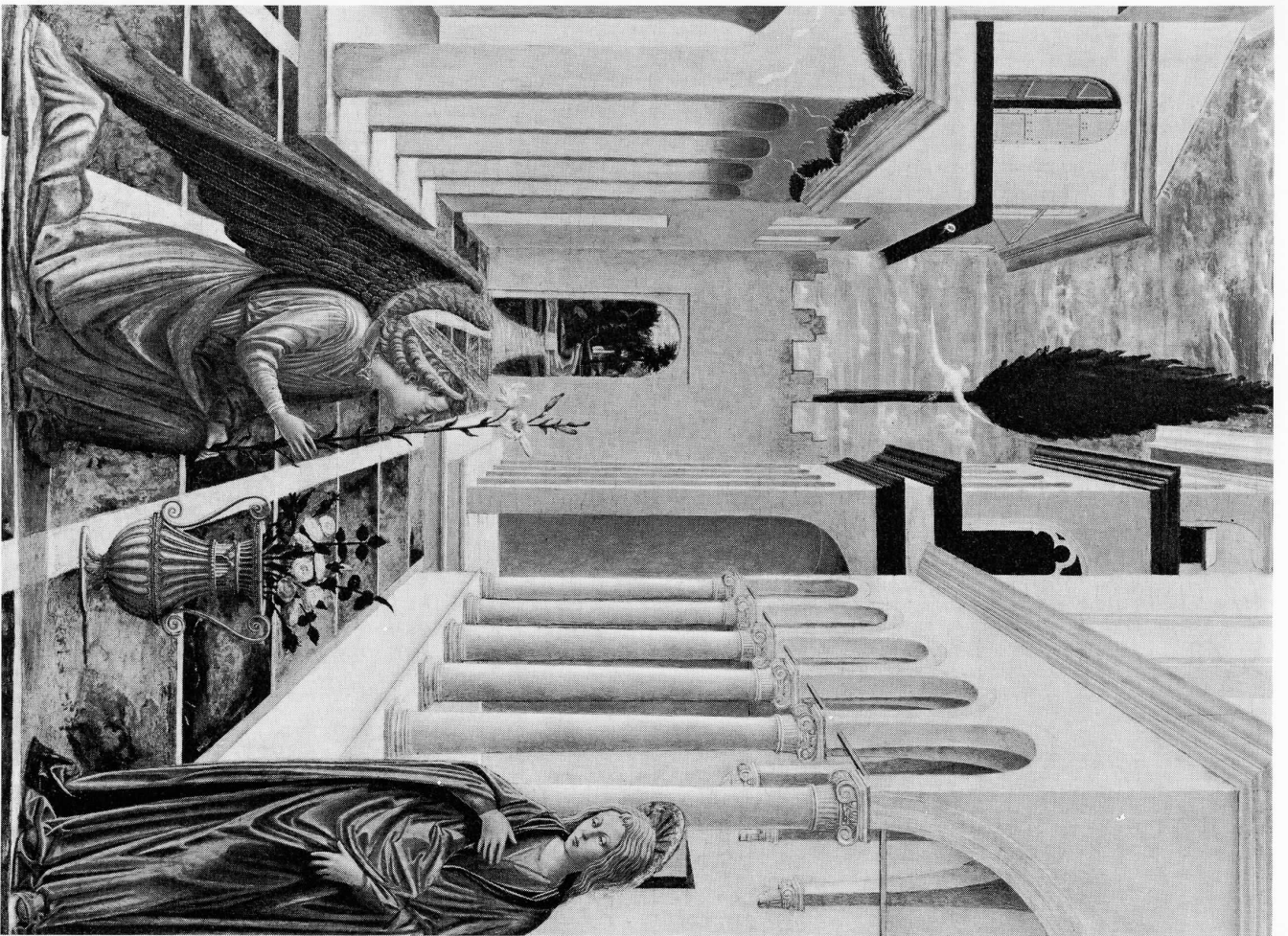
1. *Conturbatio* — Disquiet
2. *Cogitatio* — Reflection
3. *Interrogatio* — Inquiry
4. *Humiliatio* — Submission
5. *Meritatio* — Merit

The first laudable condition is called *Conturbatio*; as St. Luke writes, when the Virgin heard the Angel's salutation—'*Hail, thou art highly favoured, the Lord is with thee: blessed art thou among women*'—*she was troubled*. This disquiet, as Nicholas of Lyra writes, came not from incredulity but from wonder, since she was used to seeing angels and marvelled not at the fact of the Angel's apparition so much as at the lofty and grand salutation, in which the Angel made plain for her such great and marvellous things, and at which she in her humility was astonished and amazed (plate 24(a)).

Her second laudable condition is called *Cogitatio*: she cast in her mind *what manner of salutation this should be*. This shows the prudence of the most Holy Virgin. So then *the angel said unto her, Fear not, Mary: for thou hast found favour with God. And, behold, thou shalt conceive in thy womb, and bring forth a son, and shalt call his name JESUS* . . . (plate 24(b)).

The third laudable condition is called *Interrogatio*. *Then said Mary unto the angel, How shall this be, seeing I know not a man?* that is to say, . . . 'seeing I have the firm resolve, inspired by God and confirmed by my own will, never to know a man?' Francis Mayron says of this: 'One could say the glorious Virgin desired to be a virgin more than to conceive the Son of God without virginity, since virginity is laudable, while to conceive a son is only honourable, being not a virtue but the reward for virtue; and the virtue is more desirable than its reward, since virtue subsumes merit whereas reward does not.' For that reason this modest, pure, chaste, maidenly lover of virginity inquired how a virgin could conceive . . . (plate 24(c)).

The fourth laudable condition is called *Humiliatio*. What tongue could ever describe, indeed, what mind could contemplate the movement and style with which she set on the ground her holy knees? Lowering her head she spoke: *Behold the handmaid of the Lord*. She did not say 'Lady'; she did not say 'Queen'. Oh profound humility! oh extraordinary gentleness! 'Behold', she said, 'the slave and servant of my Lord.' And then,



The Annunciation in Florence. 1440-60.
 24b. (left) *Reflection*: Master of the Barberini Panels. Washington, National Gallery of Art, Kress Collection. Panel.
 24c. *Inquiry*: Alesso Baldovinetti. Florence, Uffizi. Panel.



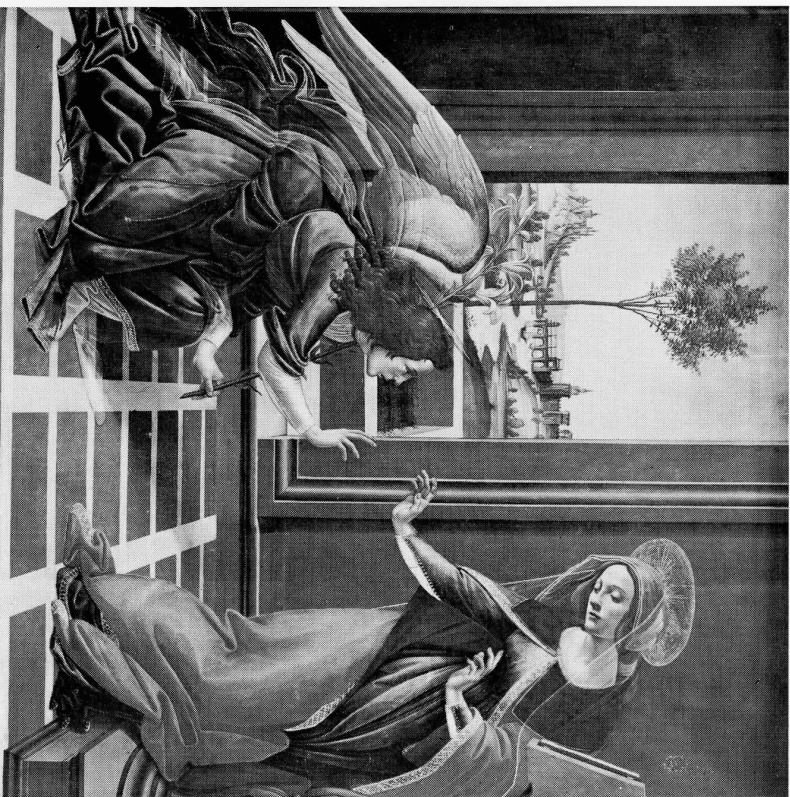
24d. *The Annunciation in Florence*. 1440–60. *Submission*: Fra Angelico. Florence, Museo di S. Marco. Fresco.

lifting her eyes to heaven, and bringing up her hands with her arms in the form of a cross, she ended as God, the Angels, and the Holy Fathers desired: *Be it unto me according to thy word* (plate 24(d)).

The fifth laudable condition is called *Meritatio* . . . When she had said these words, the Angel departed from her. And the bounteous Virgin at once had Christ, God incarnate, in her womb, according with that wonderful condition I spoke of in my ninth sermon. So we can justly suppose that in the moment when the Virgin Mary conceived Christ her soul rose to such lofty and sublime contemplation of the action and sweetness of divine things that, in the presence of the beatific vision, she passed beyond the experience of every other created being. And the bodily sensations of the Child being present in her womb rose again with indescribable sweetness. Probably, in her profound humility, she raised her eyes to heaven and then lowered them towards her womb with many tears, saying something like: 'Who am I, that have conceived God incarnate etc. . . .'

The imaginary monologue continues and brings Fra Roberto's sermon to its climax.

The last of the five Laudable Conditions, *Meritatio*, followed after the departure of Gabriel and belongs with representations of the Virgin on her own, the type now called *Annunziata* (plate 50); the other four—successively Disquiet, Reflection, Inquiry and Submission—were divisions within the sublime narrative of Mary's response to the Annunciation that very exactly fit the painted representations. Most fifteenth-century Annunciations are identifiably Annunciations of Disquiet, or of Submission, or—these being less clearly distinguished from each other—of Reflection and/or Inquiry. The preachers coached the public in the painters' repertory, and the painters responded within the current emotional categorization of the event. And though we, unprompted by Fra Roberto, respond to a general sense of excitement or thoughtfulness or humility in a picture of the scene, the more explicit categories of the fifteenth century can sharpen our perception of differences. They remind us, for instance, that Fra Angelico in his many Annunciations never really breaks away from the type of *Humiliatio*, while Botticelli (plate 25) has a dangerous affinity with *Conturbatio*; that a number of marvellous fourteenth-century ways of registering *Cogitatio* and *Interrogatio* become blurred and decay in the fifteenth century, in spite of occasional revival by a painter like Piero della Francesca; or that around 1500 painters were experimenting particularly with more complex and restrained types of *Conturbatio* than that of the tradition used by Botticelli; they shared Leonardo's distaste for the violent mode:



25. Botticelli. *The Annunciation* (about 1490). Florence, Uffizi. Panel.

... some days ago I saw the picture of an angel who, in making the Annunciation, seemed to be trying to chase Mary out of her room, with movements showing the sort of attack one might make on some hated enemy; and Mary, as if desperate, seemed to be trying to throw herself out of the window. Do not fall into errors like these.

Fifteenth-century pictorial development happened within fifteenth-century classes of emotional experience.

6. The effective unit of the stories was the human figure. The figure's individual character depended less on its physiognomy—a private matter largely left for the beholder to supply, as we have seen—than on the way it moved. But there were exceptions to this, and particularly the figure of Christ.

The figure of Christ was less open to the personal imagination than others because the fifteenth century was still lucky enough

to think it had an eye-witness account of his appearance. It was in a forged report from a fictitious Lentulus, Governor of Judea, to the Roman Senate:

A man of average or moderate height, and very distinguished. He has an impressive appearance, so that those who look on him love and fear him. His hair is the colour of a ripe hazel-nut. It falls straight almost to the level of his ears; from there down it curls thickly and is rather more luxuriant, and this hangs down to his shoulders. In front his hair is parted into two, with the parting in the centre in the Nazarene manner. His forehead is wide, smooth and serene, and his face is without wrinkles or any marks. It is graced by a slightly reddish tinge, a faint colour. His nose and mouth are faultless. His beard is thick and like a young man's first beard, of the same colour as his hair; it is not particularly long and is parted in the middle. His aspect is simple and mature. His eyes are brilliant, mobile, clear, splendid. He is terrible when he reprimands, quiet and kindly when he admonishes. He is quick in his movements but always keeps his dignity. No one ever saw him laugh, but he has been seen to weep. He is broad in the chest and upstanding; his hands and arms are fine. In speech he is serious, sparing and modest. He is the most beautiful among the children of men.

Not many paintings contradict this pattern.

The Virgin was less consistent, in spite of the putative portraits by St. Luke, and there was an established tradition of discussion about her appearance. There was, for example, the problem of her complexion: dark or fair. The Dominican Gabriel Barletta gives the traditional view in a sermon on the Virgin's beauty—quite a common theme of sermons, though rather symbolically approached:

You ask: Was the Virgin dark or fair? Albertus Magnus says that she was not simply dark, nor simply red-haired, nor just fair-haired. For any one of these colours by itself brings a certain imperfection to a person. This is why one says: 'God save me from a red-haired Lombard', or 'God save me from a black-haired German', or 'from a fair-haired Spaniard', or 'from a Belgian of whatever colour'. Mary was a blend of complexions, partaking of all of them, because a face partaking of all of them is a beautiful one. It is for this reason medical authorities declare that a complexion compounded of red and fair is best when a third colour is added: black. And yet this, says Albertus, we must admit: she was a little on the dark side. There are three reasons for thinking this—firstly by reason of complexion, since Jews tend to be dark and she was a Jewess; secondly by reason of witness, since St. Luke made the three pictures of her now at Rome, Loreto and Bologna, and these are brown-complexioned; thirdly, by reason of affinity. A son commonly takes after his mother, and vice versa; Christ was dark, therefore. . . .

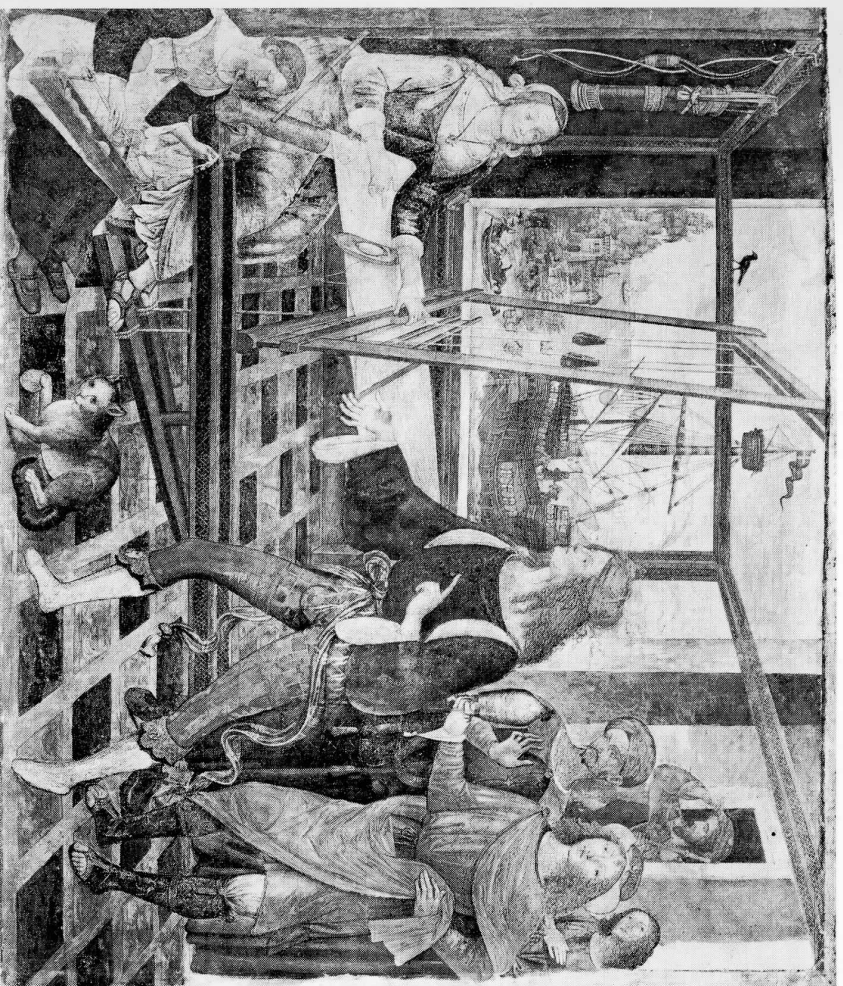
This sort of thing still left room for the imagination. As for the Saints, though many carried some physical mark as an identifying emblem—like St. Paul's baldness—they were usually open to the individual taste and the painter's own traditions.

Still, as the humanist Bartolomeo Fazio pointed out, 'painting a proud man is one thing, painting a mean or an ambitious or a prodigal one is something else.' Many figures do express an ethos independently of any relation with other figures. We probably miss very little through not reading faces in a fifteenth-century way; their complex medical physiognomics were too academic to be a viable resource for the painter, and the commonplace of popular physiognomics do not change that much:

... the eyes are the windows of the soul: almost everyone knows what their colour, what their restlessness, what their sharpness indicates. Something worth mentioning, though, is that people with long eyes are malicious and immoral. And if the white of the eye is widely extended and visible all round, this shows shamelessness; if it is concealed, not visible at all, this shows unreliability.



26. Andrea Mantegna. Detail of a Bowman, from *St. Sebastian* (about 1475). Paris, Louvre. Canvas.



27. Bernardino Pinturicchio. *Scene from the Odyssey* (about 1509). London, National Gallery. Fresco.

Leonardo da Vinci, however, distrusted physiognomics as a false science; he restricted the painter's observation to the marks left by past passion on the face:

It is true that the face shows indications of the nature of men, their vices and temperaments. The marks which separate the cheeks from the lips, the nostrils from the nose, and the eye-sockets from the eyes, clearly show whether men are cheerful and often laugh. Men whose faces are deeply carved with marks are men who engage in thought. Men whose faces are deeply carved with marks are fierce and irascible and unreasonable. Men who have strongly marked lines between their eyebrows are also irascible. Men who have strongly marked horizontal lines on their foreheads are full of sorrow, whether secret or admitted.

If a painter makes much of this sort of thing, we will pick it up anyway (plate 26).

We may miss very much more by not sharing these people's sense of close relation between movement of the body and movement of the soul and mind. A painting like Pinturicchio's *Scene from the Odyssey* (plate 27) seems to be using a language we only half understand. Is the urgent and well-dressed young man in the foreground expostulating or narrating, with his open hand and emphatic finger? Is the turbaned man with the raised palm registering surprise, dismay or perhaps even sympathy? Is the half-figure on the extreme right, with hand on heart and upturned glance, indicating a pleasant or unpleasant emotion? What is Penelope herself feeling? Collectively these questions become the general question: What is the subject of this picture? Does it represent Telemachus telling Penelope of his search for Odysseus, or does it show the Sutors surprising Penelope in her ruse of unravelling the shroud she claims to be weaving? We do not know enough of the language to be sure about it.

Physical expression of the mental and spiritual is one of Alberti's main preoccupations in his treatise on painting:

Movements of the soul are recognized in movements of the body . . . There are movements of the soul, called affections—grief, joy, fear, desire and others. There are movements of the body: growing, shrinking, ailing, bettering, moving from place to place. We painters, wanting to show movements of the mind with movements of the body's parts, use only the movements from place to place.

It is equally a preoccupation of Guglielmo Ebreo's treatise on dancing:

The virtue of dancing is as an action demonstrative of spiritual movement, conforming with the measured and perfect consonances of a harmony that descends pleasurably through our sense of hearing to the intellectual parts of our cordial senses; there it generates certain sweet movements which, as if enclosed contrary to their own nature, strive to escape and make themselves manifest in active movement.

It is much reflected in fifteenth-century judgements of people, their gravity or levity, aggressiveness or amiability. And Leonardo again lays great emphasis and spends many pages on its importance for the appreciation of painting: 'the most important things in the discussion of painting are the movements proper to the mental condition of each living being.' But though he insists again and again on the need to distinguish one sort of movement from another, he naturally finds it difficult to describe in words the particular movements he means: he planned to describe the movements of 'anger, pain, sudden fear, weeping, flight, desire,

command, indifference, solicitude, and so on', but never actually did so.

This sort of sensibility and the standards behind it are elusive now—not least because we no longer believe the old pneumatic physiology through which they were rationalized. One sees them clearly only in the rather uninteresting form of a scale of freedom of movement proper to different types of people, from the vigour of young sparks to the restraint of elderly sages: as Alberti says, philosophers should not behave like fencers: But in gesture (plate 28), the most conventionalized physical expression of feeling, and in some ways the most useful for reading pictures, there are a few bearings to be found.

There are no dictionaries to the Renaissance language of gestures, though there are sources which offer suggestions about a gesture's meaning: they have little authority and must be used with tact, but suggestions borne out by consistent use in pictures do have a useful hypothetical role. Leonardo suggested two sources for the painter to draw on for gestures—orators, and dumb men. We can half follow him in this and look at two kinds of men who recorded some of their gestures—preachers, and monks bound to silence. Only a few hints come from the latter, lists of the language of signs developed in the Benedictine order for use during periods of silence. From the several hundred signs in the lists, half-a-dozen are worth trying on paintings; for instance:

Affirmation: lift your arm gently . . . so that the back of the hand faces the beholder.

Demonstration: a thing one has seen may be noted by opening the palm of the hand in its direction.

Grief: pressing the breast with the palm of the hand.

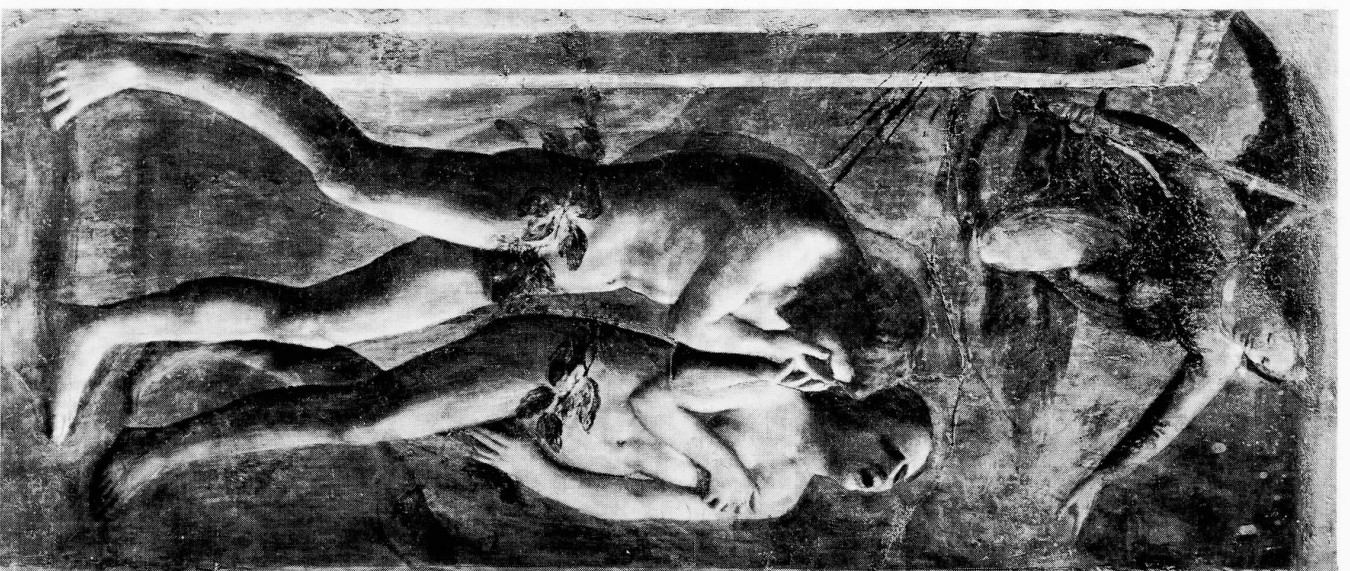
Shame: covering the eyes with the fingers.

Thus we are encouraged, for example, to read Masaccio's *Expulsion from Paradise* (plate 29) in a more precise way, as combining in the paired figures two inflections of emotion: it is Adam (*luminata tegens digitis*) who expresses shame, Eve (*palmam premens pectus*) only grief. Any reading of this kind depends on context; even in the Benedictine lists a hand on the heart, a smile, and eyes raised to heaven indicated joy, not grief. And it is possible that Quattrocento people themselves could mistake the meaning of a gesture or movement. S. Bernardino of Siena complained in one of his sermons that painters showed St. Joseph in the Nativity resting his chin on his hand (Colour Plate IV), indicating melancholy; but Joseph was a cheerful old man, he says, and should be shown so.



28. Florentine, mid 15th century. *Eight studies of a hand*. Rotterdam, Museum Boymans-van Beuningen. Chalk and wash.

29. (right) Masaccio. *The Expulsion from Paradise* (about 1427). Florence, S. Maria del Carmine. Fresco.



Though the gesture does often indicate melancholy, as at death beds, it is also used in the sense of meditation, as a Nativity context would suggest. Of course, it sometimes means both (plate 30).

A more useful and rather more authoritative source is through the preachers, skilled visual performers with a codified range of gesticulation not special to Italy. An Italian preacher could tour northern Europe successfully preaching even in places like Brittany and getting his effect largely through gesture and the quality of his delivery. Many Italians must have followed Latin sermons by the same means. There was biblical authority of a sort for this art of gesture: 'One must suppose that Christ used gesture when he said "Destroy this temple" (John II: 19)—putting his hand on his breast and looking towards the temple.' The preacher was taught to accent his texts in a similar way:

Sometimes the preacher should try to speak with horror and excitement, as in *Except ye turn, and become as little children, ye shall in no wise enter the Kingdom of heaven.* (Matthew 18: 3)

Sometimes with irony and derision, as in *Dost thou still hold fast thine integrity?* (Job 2: 9)

Sometimes with an agreeable expression, drawing the hands towards oneself [*attrahio manum*], as in *Come unto me, all thee that labour and art heavy laden, and I will give you rest.* (Matthew 11: 28)

Sometimes with elation and pride, as in *They are come from a far country unto me, even from Babylon.* (Isaiah 39: 3)

Sometimes with disgust and indignation, as in *Let us make a captain, and let us return into Egypt.* (Numbers 14: 4)

Sometimes with joy, raising the hands up [*elevatio manum*], as in *Come, ye blessed of my Father . . .* (Matthew 25: 34)

The problem was always, where to draw the line; Thomas Waleys's mid-fourteenth-century *De modo componendi sermones* urged:

. . . let the preacher be very careful not to throw his body about with unrestrained movement—now suddenly lifting up his head high, now suddenly jerking it down, now turning to the right and now with strange rapidity to the left, now stretching out both hands as if embracing East and West, now suddenly knitting the hands together, now extending his arms immoderately, now suddenly pulling them back. I have seen preachers who behaved very well in other respects, but who threw themselves about so much they seemed to be fencing with somebody, or to be insane enough to throw themselves and their pulpit to the ground, were there not people there to restrain them.

Fra Mariano da Genazzano—a preacher particularly admired for his delivery by the humanist Poliziano—collected his freely falling tears in cupped hands and threw them at the congregation. Such excesses were unusual enough to cause the comment through which we know about them, but a more moderate and traditional set of histrionic accents was evidently normal. There is a succinct English list of the conservative minimum in the third edition of the *Mirror of the World*, from the 1520s:

[1] . . . whan thou spekest of a solempne mater to stande vp ryghte with lyrell meynge of thy body, but poyntyng it with thy fore fynger.

[2] And whan thou spekest of any cruell mater or yrefull cause to bende thy fyst and shake thyn arme.

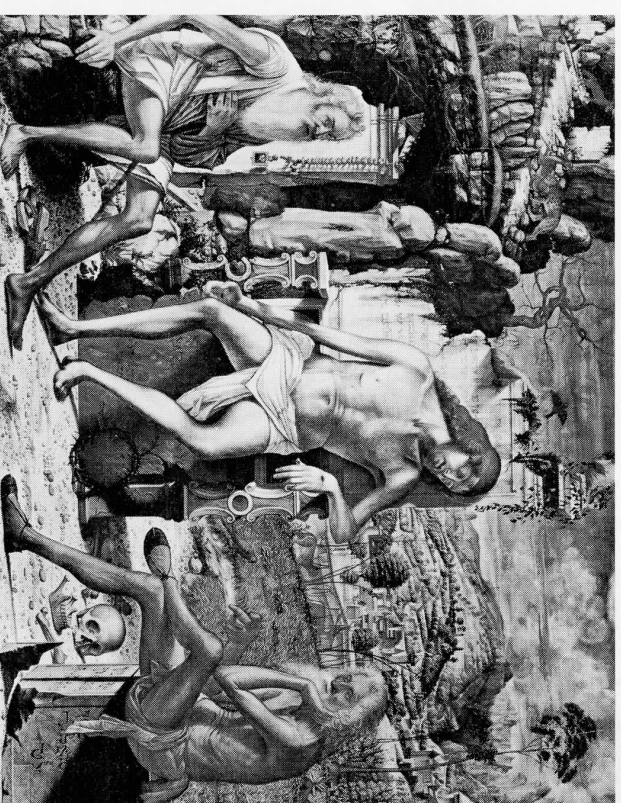
[3] And whan thou spekest of any heuently or godly thynges to loke vp and poine towards the skeye with thy finger.

[4] And whan thou spekest of any gentlines, myldenes, or humylyte, to ley thy handes vpon thy breste.

[5] And whan thou spekest of any holy mater or devocyon to holde vp thy handes.

Developing a list like this in one's mind, revising and enlarging it from one's experience of the pictures, is a necessary part of looking^{at} Renaissance pictures. Handling the same matter as the

30. Vittore Carpaccio. *The Dead Christ with St. Jerome and Job* (about 1490). New York, Metropolitan Museum of Art. Panel.





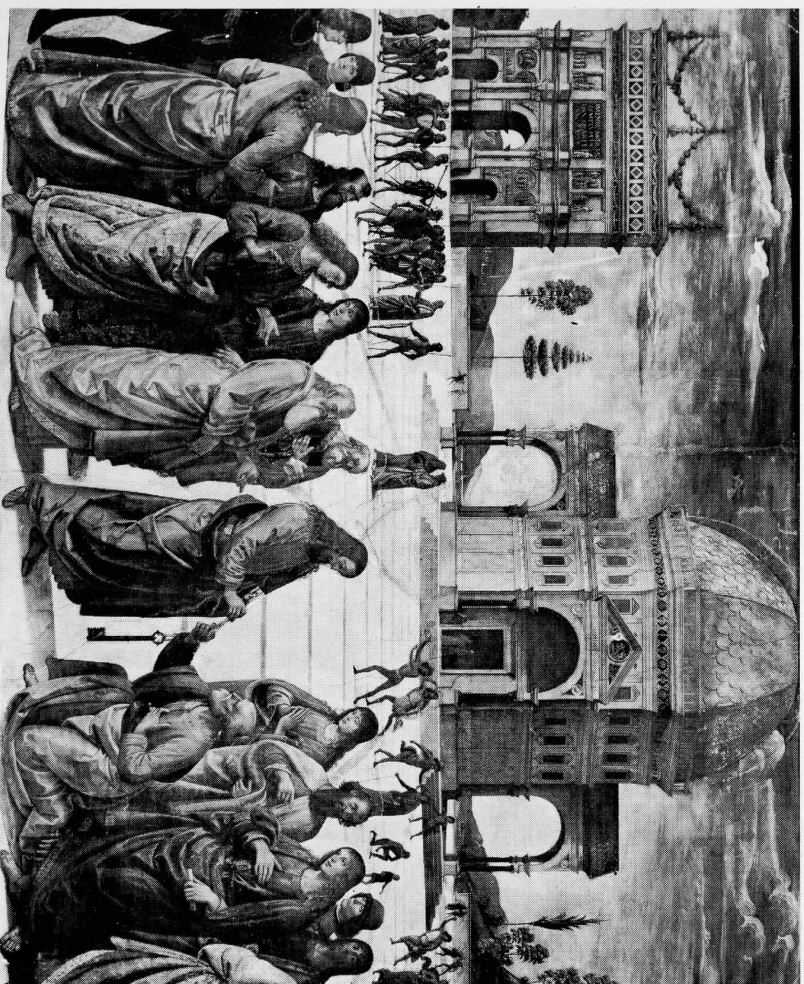
31. Fra Angelico. *The Coronation of the Virgin* (about 1440–5). Florence, S. Marco. Fresco.

preachers, in the same place as the preachers, the painters let the preachers' stylized physical expressions of feeling enter the paintings. The process can be watched under way in Fra Angelico's *Coronation of the Virgin* (plate 31). Fra Angelico uses the fifth gesture on our list to make six preachers—or at least six distinguished members of the Order of Preachers—give a massive cue to our response: when you speak of any holy matter or devotion, hold up you hands. The gestures were useful for diversifying a clutch of Saints, as in Perugino's fresco in the Sistine Chapel of the *Charge to St. Peter* (plate 32). They were often useful for injecting a richer narrative meaning into a group (plate 12).

This was pious gesture. Secular gesture was not discontinuous with it, but had a range of its own, difficult to pin down: unlike the pious kind, no one taught it in books, it was more personal, and it changed with fashion. A convenient example, and useful for reading some good paintings, is a gesture used in the second half of the century to indicate invitation or welcome. It can be studied in a woodcut of 1943 (plate 33) illustrating a Florentine edition of Jacobus de Cessolis' *Liber scaccorum*, a medieval allegory of the social order as a chess-board; the Queen's Bishop's Pawn is an innkeeper in the allegory, and one of three attributes by which one recognizes him is to be his gesture of invitation—'he has his right hand extended in the manner of a person who invites.' The palm of the hand is slightly raised and the fingers are allowed to fan slightly downwards.

Prompted by the woodcut we can find this gesture playing a

32. Perugino. *Donation of the Keys to St. Peter* (detail). Vatican, Sistine Chapel. Fresco.





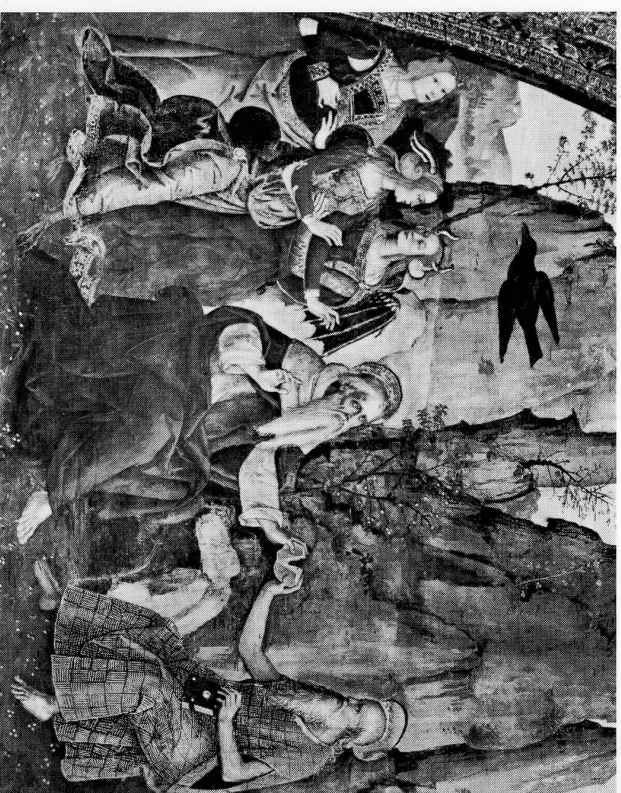
Lexro schacho dinanz ialafino m'aco pre
 se questa forma. Che fu un huomo che ha
 uena lamano dritta fresa anodo di perso
 na che inuira e. Nella man manca ha uena uno paner

33. Queen's Bishop's Pawn (The Innkeeper). From Jacobus de Cessolis. *Libro di giuoco degli scachi* (Florence, 1493/94). Woodcut.

part in many paintings; even when we already know that the painting represents an encounter, knowing the gesture helps us to read it more crisply, because the gesture lends itself to different expressive inflections. In Botticelli's fresco of *A young man received by the Liberal Arts* (plate 34) the principal figure uses a straightforward form to welcome the youth. Lodovico Gonzaga welcomes his son Cardinal Francesco Gonzaga with a version of seigneurial restraint in Mantegna's *Camera degli Sposi* (plate 5). Pinturicchio, always quick with an apt gesture, makes dramatic play with it in a group of three temptresses on their way to tempt St. Antony Abbot (plate 35). Any hearer of Fra Roberto Caracciolo's or another preacher's sermon on St. Antony would know the girls represented the second of four stages of assault on him, *carnalis stimulo*, and to the discriminating eye the character of the girls is already very clear in an over-free use of their hands. The maiden's handbook *Decor puellarum*, printed in Venice in 1471,



34. Botticelli. *The Liberal Arts Receiving a Young Man* (detail). Paris, Louvre. Fresco.



35. Bernardino Pinturicchio. *St. Antony Abbot and St. Paul the Hermit* (detail). Vatican, Appartamento Borgia. Fresco.



36. Botticelli. *Primavera* (detail). Florence, Uffizi. Panel.

orthodoxly urged 'Whether you are standing still or walking, your right hand must always rest upon your left, in front of you, on the level of your girdle.' Neglecting this rule the middle temptress, though she is being restrained by a colleague with a better sense of timing, is making invitation gestures not with one hand but with two. A more subtle and important case is Botticelli's *Primavera*: here the central figure of Venus (plate 36) is not beating time to the dance of the Graces but inviting us with hand and glance into her kingdom. We miss the point of the picture if we mistake the gesture.

We also miss something if we lack the sense of a certain distinction between religious and profane gesture. It was not a sharp distinction: in particular, a primarily religious gesture is often used for a secular subject and carried a corresponding weight. In the absence of any other guide, the preacher's list can even give a little insight into the mystery of Pinturicchio's *Scene from the Odyssey*. Similarly, his use of the thoroughly secular gesture of invitation by the temptress in *St. Antony and St. Paul* is a profane accent with a purpose. But generally religious pictures lean to pious gesticulation, removing the holy stories a little from

the plane of everyday profane life, establishing a distinct mode of physical events, supra-normal, a distinct grand style.

7. A figure played its part in the stories by interacting with other figures, in the groupings and attitudes the painter used to suggest relationships and actions. The painter was not the only practitioner of this art of grouping: in particular, the same subjects were often represented in sacred drama of one kind or another. This is not true of all cities. In Florence there was a great flowering of religious drama during the fifteenth century, but in Venice such presentations were forbidden. Where they did exist they must have enriched people's visualization of the events they portrayed, and some relationship to painting was noticed at the time. In 1439 a Russian bishop, in Florence for the Council of Florence, saw and described two plays he attended in churches, the *Annunciation* and the *Ascension*. He remarked on the similarity of this or that detail with paintings: 'The Apostles had bare feet and were as one sees in holy images.' 'The angel Gabriel was a beautiful youth, dressed in a gown as white as snow, decorated with gold—exactly as one sees heavenly angels in paintings.' But his and other descriptions of the sacred dramas do not tell us much about what we want to know: the way in which one actor physically addressed another. Two things however seem fairly clear. The first, negative and presumptive, is that the descriptions we have of sacred representations often point to their depending on spectacular effects which have little to do with the refined narrative suggestion of the painter. The plays seen by the Russian bishop in 1439 made their point with elaborate mechanical means, actors suspended on strings, great revolving discs, massed sources of artificial light, people going up and down in wooden clouds. Representations of the stories in the streets, like the St. John's Day celebrations in Florence described by Matteo Palmieri in 1454, because they were less verbal and had a stronger element of the *tableau vivant*, seem closer to the painter, but even they relied on a splendour of numbers: 200 horsemen followed the Three Kings in 1454. There were many more modest shows, of course, but the painter, using the complex and subtle grouping of a few figures to suggest a dramatic event, handling static figures in such a way as to suggest mobile relationships but not contradicting the fact of his figures being immobile, could have only a limited amount in common with any of this.

In the second place, such fragmentary hints as one can find about the acting of the plays suggest that what they had in

common with the pictures may have been, paradoxically, what seem to us anti-dramatic conventions rather than realism. For instance, the plays were introduced by a choric figure, the *festaiuolo*, often in the character of an angel, who remained on the stage during the action of the play as a mediator between the beholder and the events portrayed: similar choric figures, catching our eyes and pointing to the central action, are often used by the painters (plate 37). They are even recommended by Alberti in his *Treatise on Painting*: 'I like there to be a figure which admonishes and instructs us about what is happening in picture. . . . ' The Quattrocento beholder would have perceived such choric figures through his experience of the *festaiuolo*. Or

37. Filippo Lippi. *The Virgin Adoring the Child* (about 1465). Florence, Uffizi. Panel.



38. Piero di Cosimo. *The Visitation* (about 1490–1500). Washington, National Gallery of Art. Panel.

again, the plays were acted by figures which did not normally leave the stage between their appearances; instead they sat in their respective *sedie* on the stage, rising to speak their lines and move through their actions. The Florentine play of *Abraham and Hagar* has unusually clear directions for this:

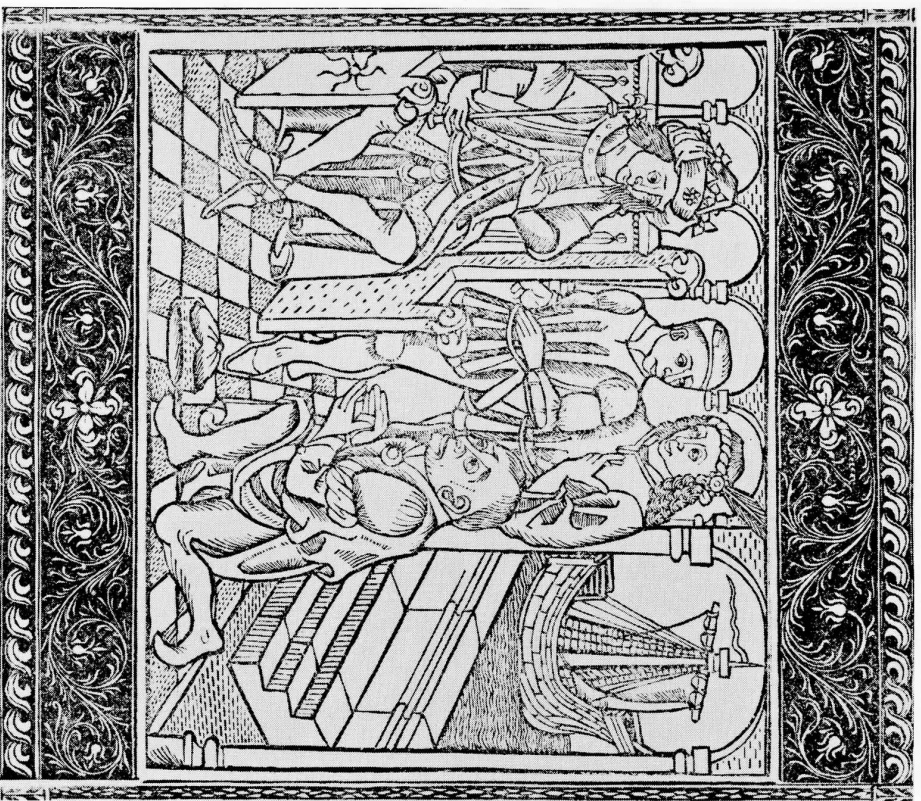
When he has finished the prologue, the *festaiuolo* goes to his seat. And Abraham sits in a raised position, and Sarah near him; and at their feet on the right is Isaac, and to the left, rather further away, are Ishmael and Hagar his mother. And at the end of the stage on the right there should be an altar, to which Abraham will go to pray; and at the end of the stage on the left there must be a hill on which is a wood with a large tree where a spring will appear when the moment comes [for the episode of Hagar and the angel].

Hagar and Ishmael take no part for the first few minutes: they wait in their seats, as Abraham will return to his. This convention too has its counterpart in the logic of many paintings (plate 38).

For instance, in Filippo Lippi's *Virgin and Child with Saints* the assisting figures of saints sit awaiting their moment to rise and interpret, much as Prophets did in Florentine plays of the Annunciation.

In any event, with what one knows of these various spectacles one is still some way from the centre of the problem of the quality that interests us in the paintings: which is, how the depicted stance of, say, two figures towards each other can be so richly evocative of an intellectual or emotional relationship—hostility, love, communication—on a level less explicit than assault, embraces, holding of the ear, or even than truncated versions of these actions. The painter worked with nuances: he

39. Aesop and Croesus. From Aesop. *Vita [et] Fabule* (Naples, 1485). Woodcut.



knew that his public was equipped to recognize with little prompting from him that one figure in his painting was Christ, another John the Baptist, and that John was baptizing Christ. His painting was usually a variation on a theme known to the beholder through other pictures, as well as private meditation and public exposition by preachers. Along with various motives of decorum this excluded violent registration of the obvious. The painters' figures play out their roles with restraint.

But this muted mode of physical relationship did feed on a grosser vernacular institution of group and gesture; this does not often intrude into paintings but is occasionally documented in a humbler medium like woodcut book illustration. A woodcut from a book like the Naples *Life and Fables of Aesop* of 1485 (plate 39) works with a vigorous, vulgar and very eloquent group of figures. Even before we have read the text we get a clear intimation from the woodcut of the sort of action under way. The kneeling figure with half-closed hands is apparently appealing to the figure on the throne, whose raised hand suggests he is impressed. The two figures standing on the right are grouped in such a way as to imply association with each other. The one extends a hand as if also in mild appeal; the other, who is surely grinning, half hooks a thumb in the direction of the ship. If we check this against the text, we find that, indeed, the kneeling figure is Aesop, pleading successfully with King Croesus for tribute brought to him by the Samians, on the right, to be returned to Samos.

The painters version of this suggestiveness was muted, but even the most notoriously reticent painter in these matters, Piero della Francesca, relied on the beholder's disposition to read relationships into groups. In his *Baptism of Christ* there is a group of three angels on the left (plate 40) who are used for a device which Piero often exploited. We become aware that one of the figures is staring in a heavy-lidded way either directly at us or an inch or two above or beside our heads. This state institutes a relationship between us and it, and we become sensitive to this figure and its role. He is almost a *fastidiolo*. The role is always a minor one, an attendant angel or a lady-in-waiting; but it will be standing in a close relationship with other similar figures. Often, as in the *Baptism of Christ*, its head will be next to other heads hardly differentiated from it in type, and these are looking with fixed attention at the most central point of the narrative, the baptized Christ or the meeting of Solomon and Sheba. In this way we are invited to participate in the group of figures assisting



40. Piero della Francesca. *The Baptism of Christ* (detail). London, National Gallery. Panel.

at the event. We alternate between our own frontal view of the action and the personal relationship with the angel group, so that we have a compound experience of the event: the clarity of one kind of access is enriched by the intimacy of the other. The device works on us more subtly than a hooked thumb or pointing finger and it also demands more from us: it depends on our disposition to expect and work for tacit relationships with and within a group of people, and this effort on our part gives our recognition of the group's meaning all the more charge. We become active accessories to the event. This transmutation of a vernacular social art of grouping into an art where a pattern of people—not gestulating or lunging or grimacing people—can still stimulate a strong sense of some psychological interplay, is the problem: it is doubtful if we have the right predispositions to see such refined innuendo at all spontaneously.

One fifteenth-century activity like enough the painters' groupings to give us a little insight into this is dancing: specifically the *bassa danza* (plate 41), the slow pacing dance that became popular in Italy during the first half of the century. Several things make the *bassa danza* a helpful parallel, much more so than the religious spectacles. In the first place it was an articulate art with its own treatises—the earliest is by Domenico da Piacenza, evidently written in the 1440's—and its own theoretical terminology: like the art of rhetoric, dancing had five Parts—*aere*, *maniera*, *misura*, *misura di terreno*, *memoria*. Secondly, the dancers were conceived and recorded as groups of figures in patterns; unlike the French, the Italians did not use a dance notation but described the movements of the figures fully, as if they were being seen by a spectator. Third, the parallel between dancing and painting seems to have suggested itself to fifteenth-century people too. In 1442 Angelo Galli, a poet at Urbino, wrote a sonnet to the painter Pisanello with a list of his qualities:

Art, *misura*, *aere* and draughtsmanship,
Maniera, perspective and a natural quality—
Heaven miraculously gave him these gifts.

41. Guglielmo Ebreo. *Trattato del ballo* (about 1470). Paris, Bibliothèque Nationale, MS. italien 973, miniature on fol. 21 v.



If we take the terms *aere*, *maniera* and *misura* in their dancing sense, as Domenico da Piacenza and his pupils define them, they are very apt criticism of Pisanello (plate 42). *Aere*, according to Guglielmo Ebreo, is 'airy presence and elevated movement, demonstrating with the figure . . . a smooth and most humane emphasis.' *Maniera*, according to Domenico, is 'a moderate movement, not too much and not too little, but so smooth that the figure is like a gondola oared by two oars through the little waves of a calm sea, these waves rising slowly and falling quickly.' *Misura* is rhythm, but flexible rhythm, 'slowness compensated by quickness.'

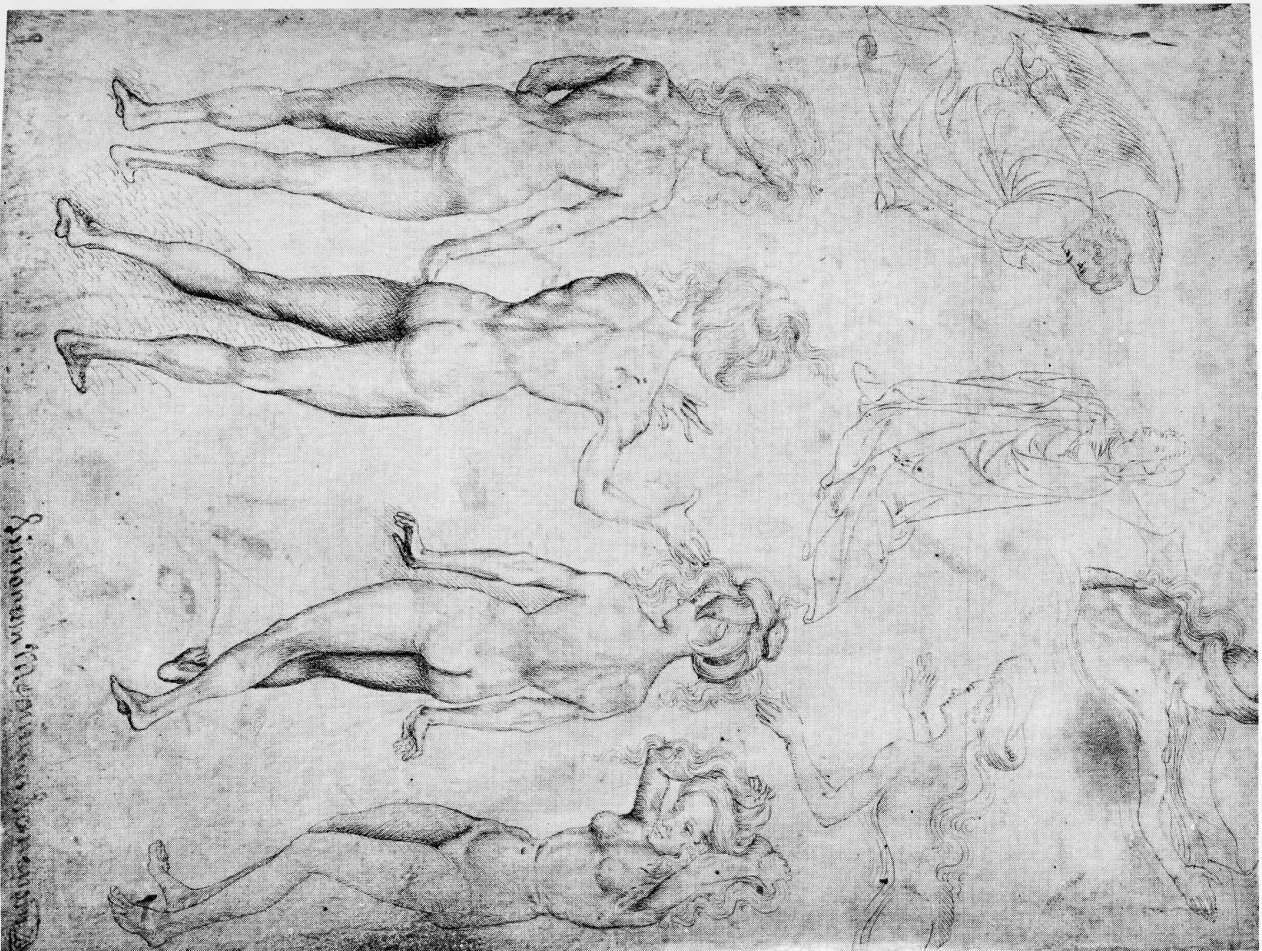
We saw how Alberti's treatise on painting and Guglielmo Ebreo's treatise on dancing shared a preoccupation with physical movements as a reflex of mental movements. The dancing manual was the more grandiloquent about it, since this was the whole point of dancing, at least from an intellectual point of view. Domenico da Piacenza cites Aristotle in defence of the art. But as well as principles the treatises offer, in the form of the dances they describe, model figure patterns quite transparently expressive of psychological relationships. The dances were semi-dramatic. In the dance called *Cupido* or *Desire* the men perform a series of convolutions suggesting that they are tied to and are at the same time pursuing their partners, whose role is retreat. In the dance called *Jealousy* three men and three women permutate partners and each man goes through a stage of standing by himself, apart from the other figures. In *Phoebus* two women act as a mobile foil for an exhibitionist man; and so on.

How the painters' style of grouping was cognate with this is usually clearest not in religious paintings but in paintings of the new classical and mythological subjects. In these the painter was forced to new invention in a fifteenth-century mode, instead of just refining and adapting the traditional religious patterns to the fifteenth-century sensibility. Botticelli's *Birth of Venus* (plate 43) was painted in the 1480s for Lorenzo di Pierfrancesco de' Medici as the *Primavera* was some years earlier: his cousin Lorenzo di Piero de' Medici, il Magnifico, had composed a dance *Venus*, probably in the 1460s:

*Bassa danza called Venus, for three persons composed by
Lorenzo di Piero di Cosimo de' Medici.*

First they do a slow sidestep, and then together they move with two pairs of forward steps, beginning with the left foot; then the middle dancer turns round and across with two reprises, one on the left foot

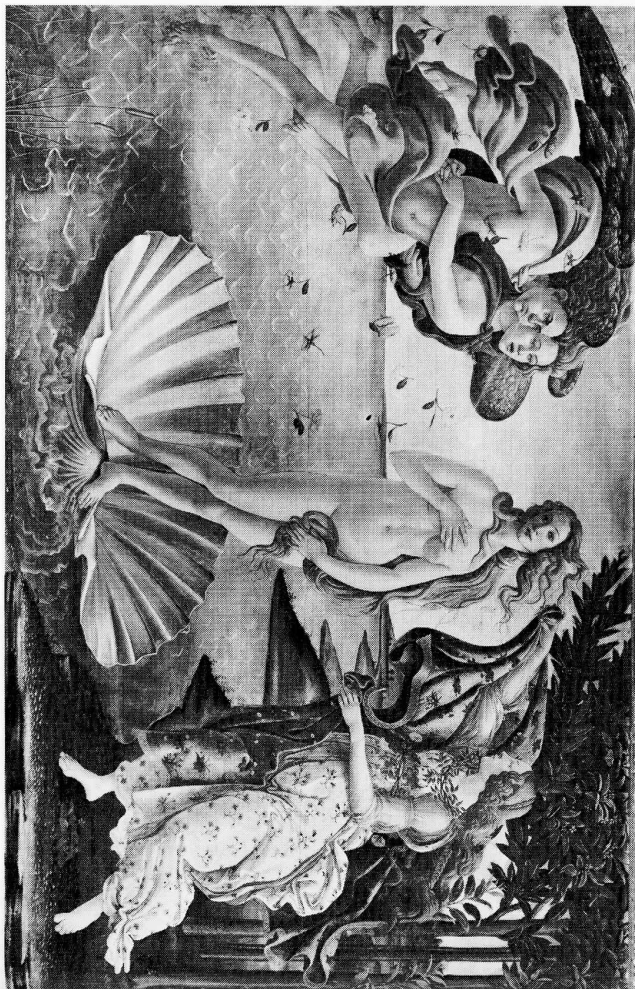
42. Pisanello. *Studies of a Girl*. Rotterdam, Museum Boymans-van Beuningen. Pen drawing.



sideways, and the other on the right foot, also across; and during the time that the middle dancer is carrying out these reprises the other two go forward with two triplet steps and then give half a turn on the right foot in such a way as to face each other; and then they do two reprises, one on the left foot and the other on the right; and then they come towards each other with a triplet, starting from the left foot; then they do a lively turn all together; then the middle dancer comes towards the others with two pairs of forward steps; and at the same time the others make a reverence on the left foot . . .

This is about a third of the dance, which develops along the same lines and is then repeated. The form is always of the two side figures dependent on the central one. Sex is not specified. The similar sense of informed pattern is of course not a matter of the particular dance having influenced the particular picture: it is that both the dance and the picture of Venus were designed for people with the same habit of seeing artistic groups. The sensibility the dance represents involved a public skill at interpreting figure patterns, a general experience of semi-dramatic arrangements that allowed Botticelli and other painters to assume a similar public readiness to interpret their own groups. When he had a new classical subject, with no established tradition for the

43. Botticelli. *The Birth of Venus* (about 1485). Florence, Uffizi. Panel.



arrangement and no assurance that the story was very widely or intimately known, he could let the figures dance their relationship out, as Botticelli lets them in his *Pallas and the Centaur* (plates 44-45). It does not matter much if we are not familiar with the story: the picture can be taken in the spirit of a *ballo in due*, a dance for two.

8. We have been looking at the painters' representations of people in terms of precisely that—represented people assessed not by the standards applied to real people but by standards adapted from experience of real people. At the same time the painters' figures and their environment were also colours and shapes, very intricate ones, and the fifteenth-century equipment for understanding them as such was not altogether the same as ours.

This is a great deal less clear and probably less important in the colours than in the shapes. Assembling symbolic series of colours was a late medieval game still played in the Renaissance. St. Antoninus and others expounded a theological code:

White:	purity
Red:	charity
Yellow-gold:	dignity
Black:	humility

Alberti and others gave an elemental code:

Red:	fire
Blue:	air
Green:	water
Grey:	earth

There was an astrological code, and Leonello d'Este, Marquis of Ferrara, was guided by it in his choice of clothes for the day. There were others too and, of course, the effect is that they largely cancel each other out. Each could be operative only inside very narrow limits: one might refer in one's mind to the heraldic code for coats-of-arms, or to the theological code when contemplating religious habits, and no doubt the astrological code when looking at Leonello d'Este. But unless reference to a code was prompted by special circumstantial cues of this kind, it could not be part of the normal digestion of visual experience. Symbolisms of this class are not important in painting, even though there are sometimes peculiarities consistent with them. There are no secret codes worth knowing about in the painters' colour.

The nearest thing to a code is what we met earlier, a greater



44. Florentine, about 1465-80. *Dancing Couple*. Engraving.

sensitivity than ours to the relative splendour of hues and the medium of emphasis this offered the painter. Hues were not equal, were not perceived as equal, and the painter and his client lived with this fact as well as they could. When Gherardo Starnina followed his instructions to use two florin blue for the Virgin and one florin blue for the rest of the picture (p. 11) he was accenting a theological distinction. There are three levels of adoration: *latitia* is the ultimate worship due only to the Trinity; *dulia*, the reverence for excellence, is what we owe the Saints, Angels and Fathers; *hyperdulia*, a more intense form of this, is due to the Virgin alone. In Starnina's frescoes *hyperdulia* measured two florins the ounce. No doubt the *latitia* due to the Father, Son and Holy Spirit was expressed in gold accents. The accent offered by a valuable pigment was not something abandoned by the painters once they and their clients had become shy about flaunting large quantities of such pigments for their own



45. Botticelli. *Pallas and the Centaur* (about 1485). Florence, Uffizi. Panel.

sake. There were expensive colours, blues made from lapis lazuli or reds made from silver and sulphur, and there were cheap earth colours like ochre and umber. The eye was caught by the former before the latter (Colour Plate IV).

This may seem a shabby fact to us—though it would be difficult rationally to say quite why—and there was some intellectual and, even more clearly, pictorial distaste for it at the time: the tension is a characteristic part of the period. The distaste expressed itself in an argument for a pure relativity of colour. The most eloquent literary statement came in about 1430 from the humanist Lorenzo Valla, exasperated by a foolish heraldic hierarchy of colours the trecento lawyer Bartolo da Sassoferrato had pompously laid down:

Now let us look at Bartolo's theories of colour . . . the colour gold [*laurus*] is the most noble of colours, he says, because light is represented by it; if someone wished to represent the rays of the sun, the most luminous of bodies, he could not do it more properly than by rays of gold; and it is agreed that there is nothing more noble than light. But if by gold we mean a tawny [*fulvus*] or reddish-yellow [*rutilus*] or yellowish [*croceus*] colour, who was ever so blind or sottish as to call the sun yellowish? Raise your eyes, you ass Bartolo . . . and see whether it is not rather of a silvery white colour [*argenteus*].

Which colour does he put next? . . . 'Sapphire-colour' [*sapphirus*], he says, is next—the barbarous and effeminate word he uses for what grown-ups call blue [*azurus*]. Air, he says, is represented by this colour. But does not this suggest he is now following the order of the elements? It does. But why did he leave the moon out . . . ? If you put the sun first, then you ought to make the moon second, and if you call the one golden you should call the other silver and next after the sun, just as silver comes second after gold . . . You put sapphire-colour in second place, Bartolo, seduced away from the hierarchy of Heavenly Bodies by the hierarchy of the Elements. Of course you do not think it right to take your examples from metals, stones, grasses and flowers; they would have been more appropriate, but you saw them as humble and abject things, you, O Bartolo, that are constitute of sun and of air alone. For, if we are following the order of elements, you have mentioned two but left two more out; and we, waiting for the grand and lofty progression to continue, feel let down. If the first colour is of fire and the second of air, the third will be of water and the fourth of earth. . . .

But let us pass on. A little later the man says white is the noblest colour and black the lowest; and as for the other colours, they are good to the extent that they approach white and inferior as they approach blackness. There are a number of things to complain about in this. Does he not remember now what he said about gold . . . ? And why do we die silk purple or white linen red, unless we find red more attractive than white? For while white is indeed the plainest and purest colour, it is not invariably the best. . . .

And what shall I say of black? Indeed I find it is not considered of inferior excellence to white: the raven and swan are both holy to Apollo . . . In my view Ethiopians are more beautiful than Indians for

the very reason that they are blacker. Why appeal to human authority when it is made puny by the heavenly? . . . If the Maker of all things saw no difference of value in colours, why should we little men do so? Do we know more than God and shame to follow him? In Jesus' name, even if Bartolo did not consider the stones and grasses and flowers and so many other things in his pronouncement on dress and ornament, how can he have overlooked the birds' dress—the cock, peacock, woodpecker, magpie, pheasant and all the rest . . . Come then, hearken to this man at odds with God and men; and let us impose a law on our Pavia girls, now spring is nearly here, not to presume to weave garlands except as Bartolo prescribes. . . . But enough of this. It is stupid to lay down laws about the dignity of colours.

There are many pictorial statements of a similar argument (Colour Plate II).

Valla's appeal to the limited, not to say medieval, sector of Nature represented by flowery meadows was a conventional move: the sculptor Filarete invoked the same meadows in some rather unhelpful remarks about which hues go well with which:

Learn from Nature and the fine arrangement of flowers in the meadows and grasses. Any colour goes well with green—yellow, red and even blue. You know how well white and black suit each other. Red does not go so well with yellow; it does go well with blue, but better still with green. White and red are good together.

Alberti's remarks on colour harmonies are less simple-minded, and unrelated to the element symbolism he also perfunctorily admitted:

It will be pleasing in a picture if one colour is different from the next. For instance, if you are painting Diana and her band of nymphs, let one nymph have green drapery, another white, another rose, another yellow—different colours for each, and in such a way that light tones are always next to dark tones. If you have this contrast [of hues and of tones], the beauty of the colours will be clearer and more graceful. And there exists a certain affinity of colours, one joined with another producing a pleasing and worthy effect (Colour Plate I). A rose colour and a green or blue colour next to each other give beauty and seemliness to each other. The colour white produces a fresh and graceful effect not only next to grey and yellow but next to almost any colour. Dark colours stand excellently among light ones, and similarly light colours are well if surrounded by dark. Thus will the painter dispose his colours.

Alberti's remarks on colour combination are the most distinguished one finds, and the difficulty of understanding quite what he means is a warning: words were not the medium in which fifteenth-century men, or anyone else, could register their colour sense.

9. In Florence, and in most other towns one knows about, a boy in the private or municipal lay schools—the alternatives were the church schools, now rather in decline, or one of the few humanist schools—was educated in two stages. For about four years from the age of six or seven he was at a primary school or *botteghezza*, where he learned reading and writing with some elementary business correspondence and notarial formulas. Then, for about four years from the age of ten or eleven, most would go on to a secondary school, the *abbaco*. They read a few more advanced books here, like Aesop and Dante, but the weight of the teaching was now on mathematics. A few went on after this to a university to become lawyers, but for most middle-class people the mathematical skills of the secondary school were the climax of their intellectual formation and equipment. Many of their primers and handbooks survive and one can see very clearly what sort of thing this mathematics was: it was a commercial mathematics adapted to the merchant, and both of its principal skills are deeply involved in fifteenth-century painting.

One of these is gauging. It is an important fact of art history that commodities have come regularly in standard-sized containers only since the nineteenth century: previously a container—the barrel, sack or bale—was unique, and calculating its volume quickly and accurately was a condition of business. How a society gauged its barrels and surveyed its quantities is important to know because it is an index of its analytical skills and habits. For instance, in the fifteenth century Germany seems to have gauged its barrels with complex prepared rulers and measures from which the answers could be read off: the job was often done by a specialist. An Italian, by contrast, gauged his barrels with geometry and π :

There is a barrel, each of its ends being 2 bracci in diameter; the diameter at its bung is $2\frac{1}{4}$ bracci and halfway between bung and end it is $2\frac{3}{8}$ bracci. The barrel is 2 bracci long. What is its cubic measure?

This is like a pair of truncated cones. Square the diameter at the ends: $2 \times 2 = 4$. Then square the median diameter $2\frac{3}{8} \times 2\frac{3}{8} = 4\frac{9}{16}$. Add them together: $8\frac{9}{16}$. Multiply $2 \times 2\frac{3}{8} = 4\frac{3}{4}$. Add this to $8\frac{9}{16} = 13\frac{31}{16}$. Divide by 3 = $4\frac{11}{16}$ Now square $2\frac{1}{4} = 2\frac{1}{4} \times 2\frac{1}{4} = 5\frac{1}{4}$. Add it to the square of the median diameter: $5\frac{1}{4} + 4\frac{9}{16} = 10\frac{13}{16}$. Multiply $2\frac{3}{8} \times 2\frac{1}{4} = 5$. Add this to the previous sum: $15\frac{13}{16}$. Divide by 3: $5\frac{13}{16}$. Add it to the first result: $4\frac{11}{16} + 5\frac{13}{16} = 9\frac{24}{16}$. Multiply this by 11 and then divide by 14 [i.e. multiply by $\frac{11}{14}$]: the final result is $7\frac{3399}{3432}$. This is the cubic measure of the barrel.

It is a special intellectual world.

These instructions for gauging a barrel are from a mathematical handbook for merchants by Piero della Francesca, *De abaco*, and the conjunction of painter and mercantile geometry is very much to the point. The skills that Piero or any painter used to analyse the forms he painted were the same as Piero or any commercial person used for surveying quantities (plate 47). And the connection between gauging and painting Piero himself embodies is very real. On the one side, many of the painters, themselves business people, had gone through the mathematical secondary education of the lay schools: this was the geometry they knew and used. On the other side, the literate public had these same geometrical skills to look at pictures with: it was a medium in which they were equipped to make discriminations, and the painters knew this.

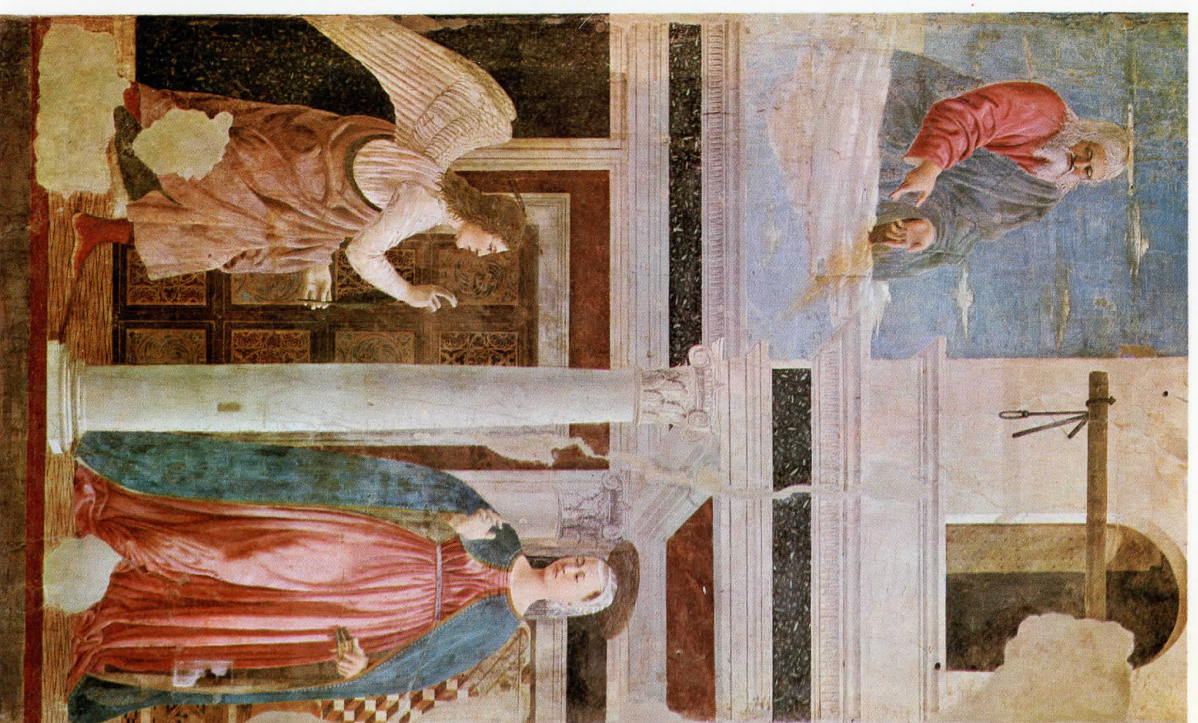
An obvious way for the painter to invoke the gauger's response was to make pointed use of the repertory of stock objects used in the gauging exercises, the familiar things the beholder would have been made to learn his geometry on—cisterns, columns, brick towers, paved floors and the rest. For instance, almost every handbook used a pavilion as an exercise in calculating surface areas; it was a convenient cone, or compound of cylinder and cone, or of cylinder and truncated cone, and one was asked to work out how much cloth would be needed to make the pavilion. When a painter like Piero used a pavilion in his painting (plate 46) he was inviting his public to gauge. It was not that they would try to make calculations about surface areas or volumes, of course, but that they were disposed to recognize the pavilion first as a compound of cylinder and cone, and then secondarily as something deviating from the strict cylinder and cone. The result was a more sharply focussed awareness of the pavilion as an individual volume and shape. There is nothing trivial about Piero's use of his public's skill here; it is a way of meeting the Church's third demand of the painter, that he should use the visual sense's special quality of immediacy and force. The beholder's precise and familiar assessment of the pavilion mediates between his own position in the everyday and the mystery of the Virgin's conception, rather as the three Angels are mediators in the *Baptism of Christ*.

In his public appearances, the painter more normally depended on his public's general disposition to gauge. To the commercial man almost anything was reducible to geometrical figures underlying any surface irregularities—the pile of grain reduced to a cone, the barrel to a cylinder or a compound of

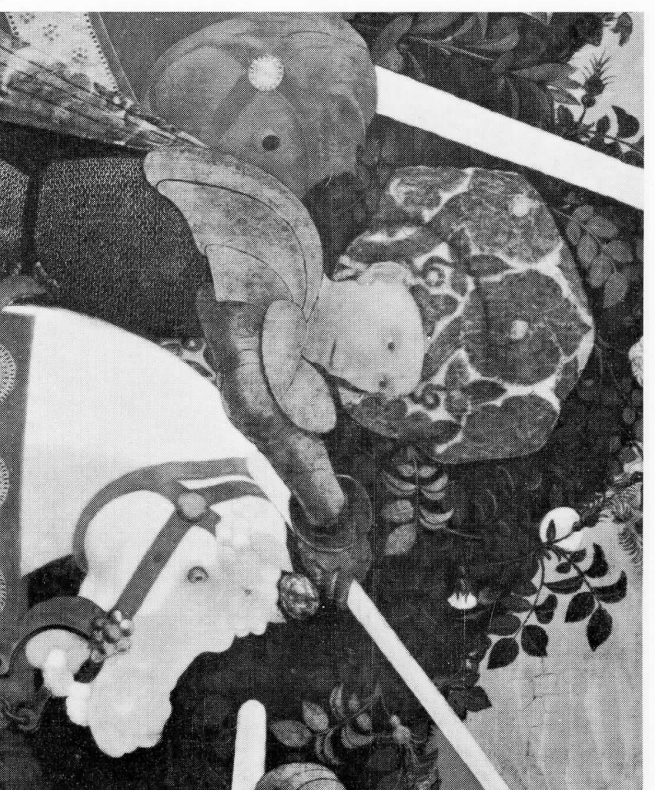


46. Piero della Francesca. *Madonna del Parto* (about 1460). Monterchi, Cimitero. Fresco.

truncated cones, the cloak to a circle of stuff allowed to lapse into a cone of stuff, the brick tower to a compound cubic body composed of a calculable number of smaller cubic bodies, and so on. This habit of analysis is very close to the painter's analysis of appearances (plate 48). As a man gauged a bale, the painter surveyed a figure. In both cases there is a conscious reduction of irregular masses and voids to combinations of manageable



1. Piero della Francesca. *The Annunciation* (about 1455). Arezzo, S. Francesco. Fresco.



49. Paolo Uccello. *The Battle of S. Romano* (detail). London, National Gallery. Panel.

the narrative than is the case with Piero's pavilion. But to think of the crown as polygonal at all demands not only certain habits of inference—such as a presumption that the bit you cannot see is a regular continuation of the part you can—not only this, but a factor of energy and interest as well: that is, we will not bother to get this far unless we enjoy the exercise in some way, even if only on the level of exercising skills we value highly. Uccello's pictorial style must meet the proper cognitive style for the picture to work.

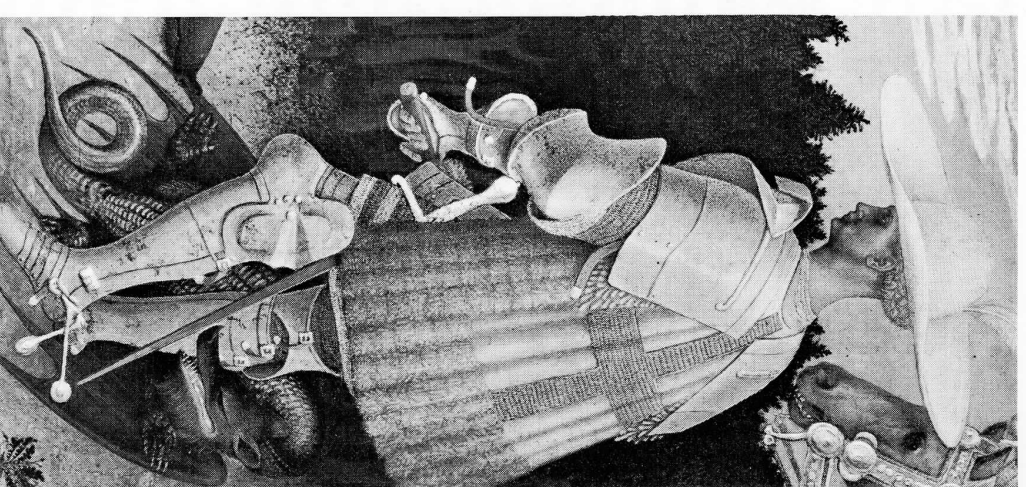
The geometrical concepts of a gauger and the disposition to put them to work sharpen a man's visual sense of concrete mass. He is likely to be aware at a higher level of the character of Adam in Masaccio's *Expulsion from Paradise* (plate 29) as a compound of cylinders or of the figure of Mary in Masaccio's *Trinity* (plate 64) as a massive truncated cone, and so of the figure itself. In the Quattrocento social world of the painter this constituted a stimulus to using his available means—in Masaccio's case, the Tuscan con-

48. (left) Giovanni Bellini. *The S. Giobbe Altarpiece* (about 1480). Venice, Accademia. Panel.



50. Antonello da Messina. *Virgin Annunciate* (about 1473). Munich, Alte Pinakothek. Panel.

vention of suggesting a mass by representing the tones of light and shadow one source of lighting would produce on it—in order to register his volumes clearly, with recognizable skill. A painter working in another convention could use different means to a similar end. For instance, Pisanello came from a north Italian tradition that registered a mass less with tones than with its characteristic edges. He could respond to the gauging sensibility



51. Pisanello. *The Virgin and Child with St. George and St. Antony Abbot* (detail). London, National Gallery. Panel.

with figures set in twisted, counterpoised attitudes so that the edge presented to the picture plane spirals round the body like ivy round a column (plate 51). In many parts of Italy people seem to have preferred this convention, perhaps because it was the sort of painting they were used to and perhaps because they liked the mobile impression it made. In any event, Pisanello's *St. George* is a gauger's field-day in its own way.

10. In his treatise *On Civil Life* the Florentine Matteo Palmieri, whose description of the St. John's Day procession we have already met, recommended the study of geometry for sharpening the minds of children. The banker Giovanni Rucellai remembered this, but replaced geometry by arithmetic: 'it equips and spurs on the mind to examine subtle matters.' This arithmetic was the other wing of the commercial mathematics central to Quattrocento culture. And at the centre of their commercial arithmetic was the study of proportion.

On 16 December 1486 Luca Pacioli the mathematician was in Pisa, and during the day he called in at the cloth warehouse of his friend Giuliano Salvati. A Florentine merchant, Onofrio Dini, was also there, and there was conversation. One of the things the Florentine, Onofrio Dini, kept his end up with was the following problem: A man was lying on his death bed and wished to make his will. His estate amounted to one thousand ducats. 200 ducats he left to the church, and 800 ducats remained. The man's wife was shortly to give birth to a child, and he wished to make specific provision for both his widow and his orphan. He therefore made this disposition: if the child was a girl then it and its mother were to share the money equally, 400 ducats each; if, on the other hand, the child was a boy it was to have 500 ducats and the widow only 300. Shortly afterwards the man died, and in due course his widow's time came. But she gave birth to twins, and, to make things more complicated, one of the twins was a boy and the other a girl. The problem is: if the proportions between mother, son and daughter desired by the deceased are honoured, how many ducats will mother, son and daughter each receive?

Onofrio Dini probably did not realize it, but the game of proportion he was playing was an oriental game: the same problem of the widow and the twins appears in a medieval Arabic book. In turn the Arabs had learned this kind of problem and the arithmetic involved in them from India, for they were a Hindu development of the seventh century or earlier. Along with much other mathematics they were brought to Italy from Islam early in the thirteenth century by Leonardo Fibonacci of Pisa. Italy was full of problems like that of the widow and the twins in the fifteenth century. They had an entirely practical function: underneath the costumes of the widow and the twins are three early capitalists carving up a profit according to their relative investment in some trading venture. It is the mathematics of commercial partnership, and it was in this context that Luca

Pacioli retells Onofrio Dini's story in his *Summa de Arithmetica* of 1494.

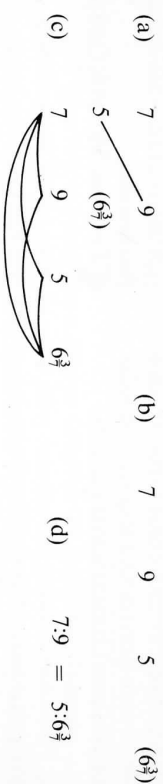
The universal arithmetical tool of literate Italian commercial people in the Renaissance was the Rule of Three, also known as the Golden Rule and the Merchant's Key. It was basically a very simple thing; Piero della Francesca explains:

The Rule of Three says that one has to multiply the thing one wants to know about by the thing that is dissimilar to it, and one divides the product by the remaining thing. And the number that comes from this is of the nature of that which is dissimilar to the first term; and the divisor is always similar to the thing which one wants to know about.

For example: seven bracci of cloth are worth nine lire; how much will five bracci be worth?

Do it as follows: multiply the quantity you want to know about by that quantity which seven bracci of cloth are worth—namely, nine. Five times nine makes forty-five. Divide by seven and the result is six and three sevenths.

There were different conventions for laying out the four terms involved:



In the thirteenth century Leonardo Fibonacci had used the rather Islamic form (a). By the fifteenth century many people preferred the terms in a straight line, as in (b). In some copybook contexts the convention grew up in the later Renaissance of connecting the terms with curved lines, as in (c). Nowadays we would represent the relationships as in (d), but this notation was not used before the seventeenth century. The curved lines in notation (c) were not just decoration: they noted the relationships between the terms, because a series of terms in the Rule of Three is in geometric proportion. It is in the nature of the form and the operation that (1) the first term stands to the third term as the second stands to the fourth, and also that (2) the first term stands to the second term as the third stands to the fourth, and also that (3) if one multiplies the first term by the fourth term the product will be the same as the product of the second and third terms. A man noted these relationships as a means of checking his calculations.

Libbre cento di Firenze fanno in Vinegia libbre c. xiii. & duo septuini al ocale; Libbre cento di Firenze fanno in Vinegia libbre. lxxi. & duo septuini al grollo. Libbra una doro filato di Vinegia fa infiniti once undici danar. xiiii. Once otto danarotto di Vinegia fa in Firenze once otto danar dieci Braccia quaranta di panno di Firenze fanno in Vinegia braccia trentacinque & mezzo. Scia tre & mezzo in tre & tre quarti di grano di Firenze fa in Vinegia flaa uno. Cagno uno & un terzo di uino di Firenze fa in Vinegia anfore uno. Moggio uno di uallonia che in Vinegia flaa dodici petla in Firenze libbre octocinquanta in moucente. Maglia tio uno dolo di Vinegia che da mille quaranta cor na in Firenze orcia uenti & un octauo o circa petla limito delloio in Vinegia libbre treta once tre al grollo & ci amfura libbre. xxv.

52. Florentine measures in exchange with those of other towns. From *Libro di mercantantie et usanze de paesi* (Florence, 1481). pp. b i v.-b ii r.

¶ Firenze con Milano. Capi. xxv. Libbre cento di Firenze fanno in Milano lib. c. v. Libbra una daretto di firenze fa in Milano once ¶ Firenze con Vienna del dalfinato. Ca. xxvi. Marcho uno daretto diuencha fa in firenze once octo danar tredici.

¶ Firenze con Ziara. Capi. xxvii. Libbre cento di Ziara di Fraunia fanno in firenze libbre. lxxxix. Marcho uno daretto di Ziara fa in Firenze once octo danar dieci

¶ Firenze con Raugia di chianona. Ca. xxviii. Libbre cento di cera di Raugia fanno in firenze libbre cento cinque. Libbra una daretto di Raugia fa in Firenze once undici & mezzo.

¶ Firenze con Chiaranza. Capi. xxix. Caud dieci di panno di chiaraenza fanno in Firenza. xi. & mezzo. Moggio un duia palla dichiarenza fanno in firenze libbre. lxxvii. Moggio uno daretto di chiaraenza fa in Firenze libbre Libbre. c. di firenze fanno in chiaraenza libbre. lxxxviii

¶ Once. di firenze fa in chiaraenza pō. vi. & un quarto. Moggio uno di grano di chiaraenza fa in Firenze una uentidua.

¶ Firenze con Modon & Corò della morea. ca. 30.

The Rule of Three was how the Renaissance dealt with problems of proportion. Problems of proportion include: pasturage, brokerage, discount, tare allowance, the adulteration of commodities, barter, currency exchange. These were very much more prominent than they are now. For instance, exchange problems were of an extraordinary complexity because each substantial city had not only its own currency but its own weights and measures. Plate 52 is a page from a Florentine *Libro di mercantile* of 1481 and deals with the differential between Florentine and some other cities' measures. Quattrocento people addressed this formidable confusion with the Rule of Three, and a good half of any of their treatises on arithmetic is given up to it. The difficulties were not of the form itself, which is simple, but of reducing a complex problem to the form, with the right terms in the right places; and for problems like compound interest the form was extended so that, instead of three initial terms, one might have many more.

Tre macftri lofiono a
 fare una cala: cōfprimo
 pette folo la fareb in
 10 di: el fecondo la fareb
 be in 12 di: el terzo la
 fareb in 15 di: tu fa
 pette lauorato cōfiero
 ueniffe intante i quati
 di farebbono la fopra
 decata cala.

$$\begin{array}{r}
 10 \text{ — } 12 \text{ — } 15 \\
 \text{di } 12 \text{ — } 1 \\
 12 \\
 10 \\
 \hline
 30 \text{ — } 120
 \end{array}$$

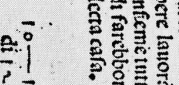
Sarebbona in 4 di



Cino macfiro farebhe
 uiauorano in 3 di e tu
 matro lo fareb in 4 di
 di. Bora qñ diua mac
 ftri lofiono un compa
 gno e lauororono tut
 tane caderò lauorato i
 15 di. Cio fapre que
 terzo cōfegno che lof
 fono i quanti di hareb
 be per fe fo fero lito
 praderò lauorato.

$$\begin{array}{r}
 30 \text{ — } 40 \text{ — } 15 \\
 30 \text{ — } 15 \\
 0 \text{ — } \frac{1}{2} \\
 \frac{1}{2} \text{ — } \frac{1}{2} \\
 15 \text{ — } 140 \\
 0 \text{ — } \frac{1}{2} \\
 \hline
 2
 \end{array}$$

Sarebbona in 12 di



Sarebbona in 12 di

E glie una coppa di 3 pe
 si chel copchio pesa il
 ½ di tutta la drappa el
 nappo pesa il ½ di tut
 ta: e il gambo pesa ~ o
 once: no sapere quāto
 pesa tutta la coppa

$$\frac{1}{2} - \frac{1}{2} = 0$$

$$\frac{30}{6}$$

$$\frac{11}{121}$$

pesa 31 ½
 oncia



E glie un pesce che s'ha
 po pesa il ¼ di tutto il
 pesce e la coda pesa il
 ½ di tutto il pesce e il tu
 sto dimesso pesa 30 on
 ce: no sapere quāto pe
 sa tutto il pesce

$$\frac{1}{4} - \frac{1}{4} = 0$$

$$\frac{3}{4}$$

$$\frac{51}{360}$$

pesa 360
 once



E glie una coppa di 3 pe
 si chel copchio pesa il
 ½ di tutta la drappa el
 nappo pesa il ½ di tut
 ta: e il gambo pesa ~ o
 once: no sapere quāto
 pesa tutta la coppa

$$\frac{1}{2} - \frac{1}{2} = 0$$

$$\frac{30}{6}$$

$$\frac{11}{121}$$

pesa 31 ½
 oncia



E glie un pesce che s'ha
 po pesa il ¼ di tutto il
 pesce e la coda pesa il
 ½ di tutto il pesce e il tu
 sto dimesso pesa 30 on
 ce: no sapere quāto pe
 sa tutto il pesce

$$\frac{1}{4} - \frac{1}{4} = 0$$

$$\frac{3}{4}$$

$$\frac{51}{360}$$

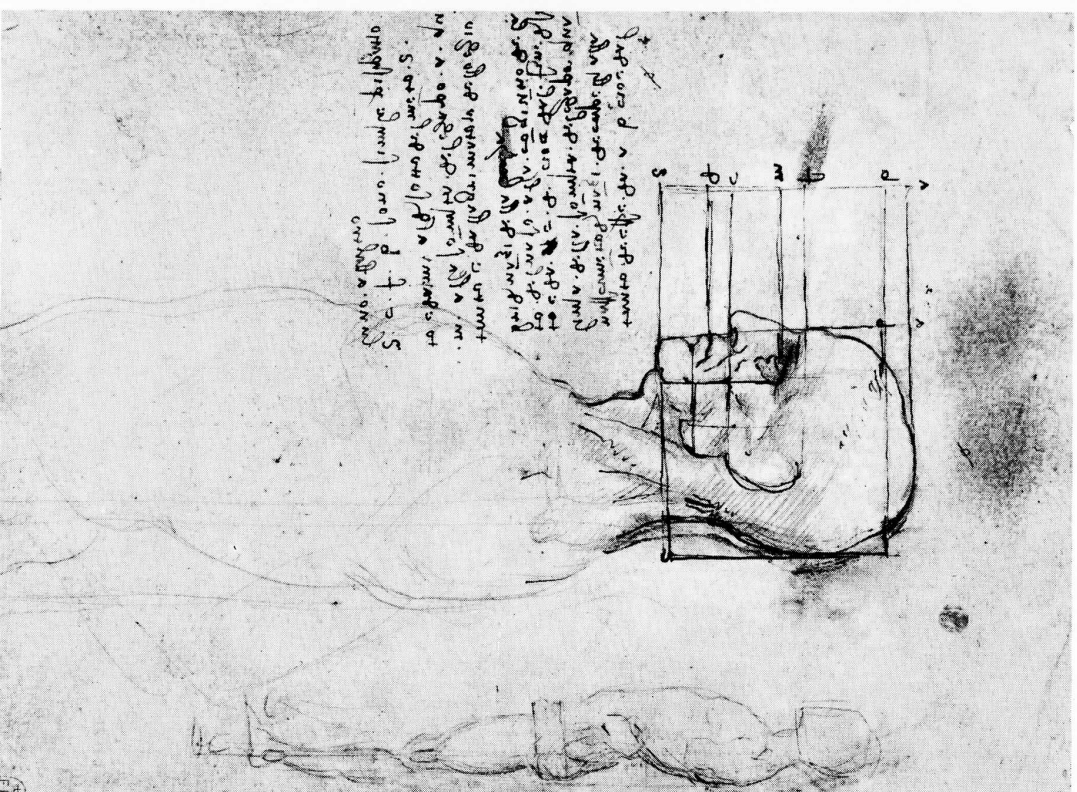
pesa 360
 once



So fifteenth-century people became adept through daily

From a to b —that is, from the roots of the hair in front to the top of the head—should be equal to cd —that is, from the bottom of the nose to the meeting of the lips in the middle of the mouth; from the inner corner of the eye m to the top of the head a is equal to the distance from m down to the chin s ; s , c , f and b are equidistant each from the next.

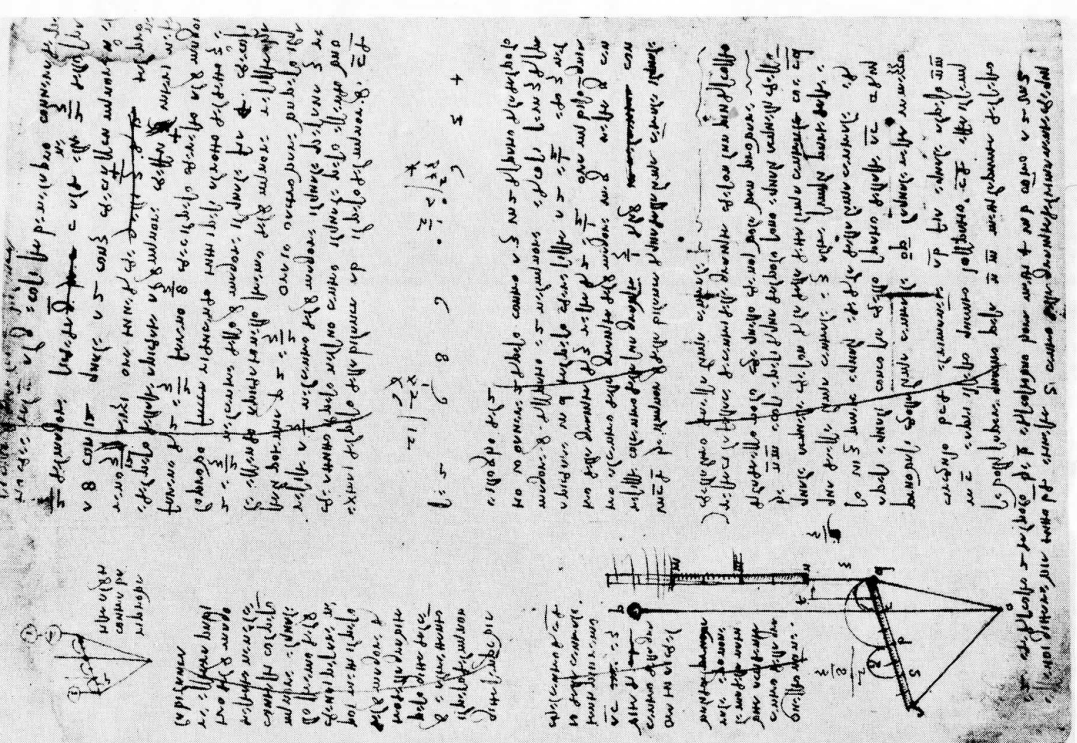
54. Leonardo da Vinci. *Study of the proportions of a head*. Windsor, Royal Library, No. 12601. Pen.

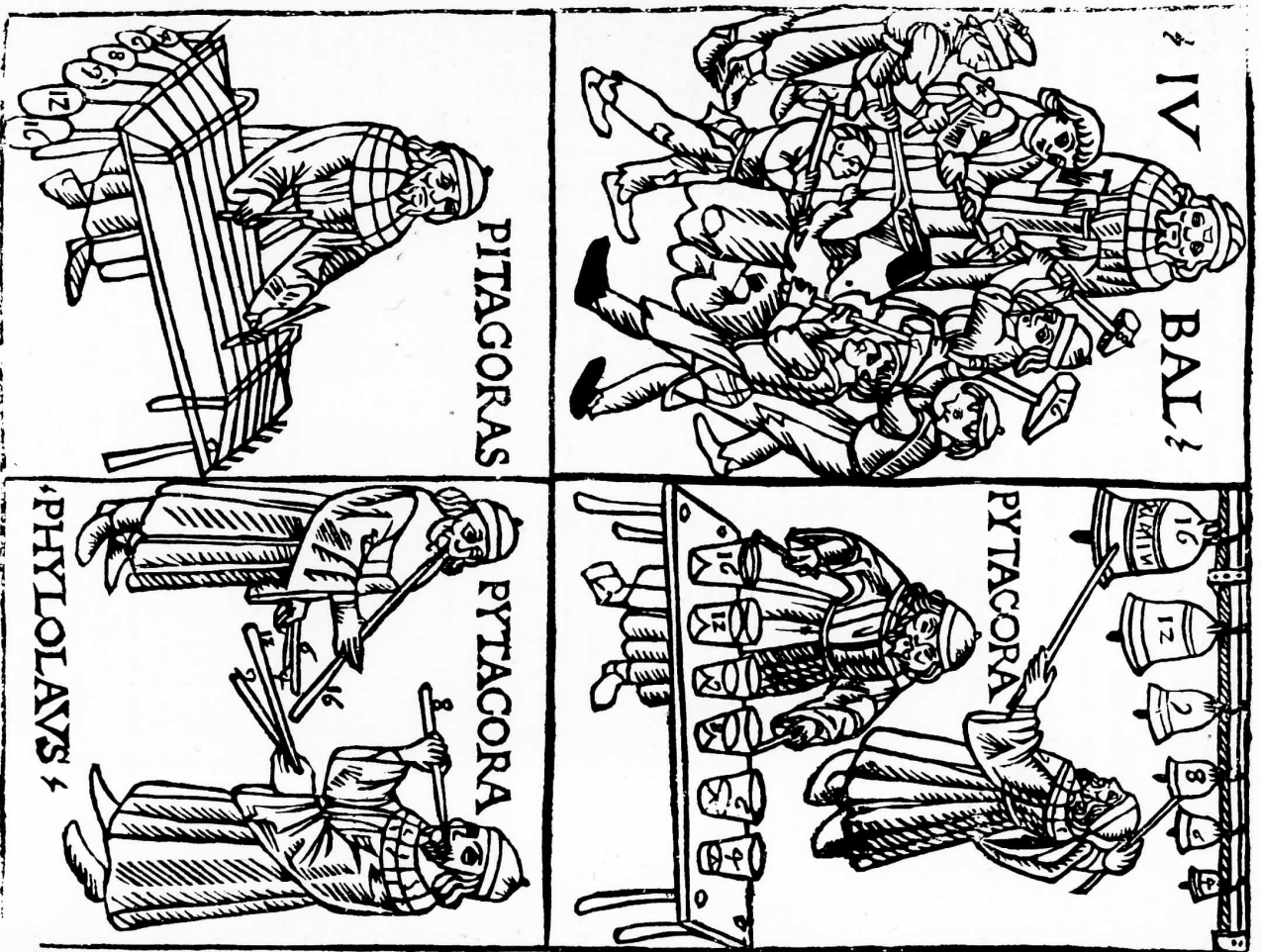


The painter's study of the proportions of the human body was usually a quite primitive affair in its mathematics, compared with what the merchants were used to.

The merchants' geometric proportion was a method of precise awareness of ratios. It was not harmonic proportion, of any convention, but it was the means by which a convention of

55. Leonardo da Vinci. *Calculation with the Rule of Three* (6:8 9:12). London, British Museum, MS. Arundel 263, fol. 32 r.

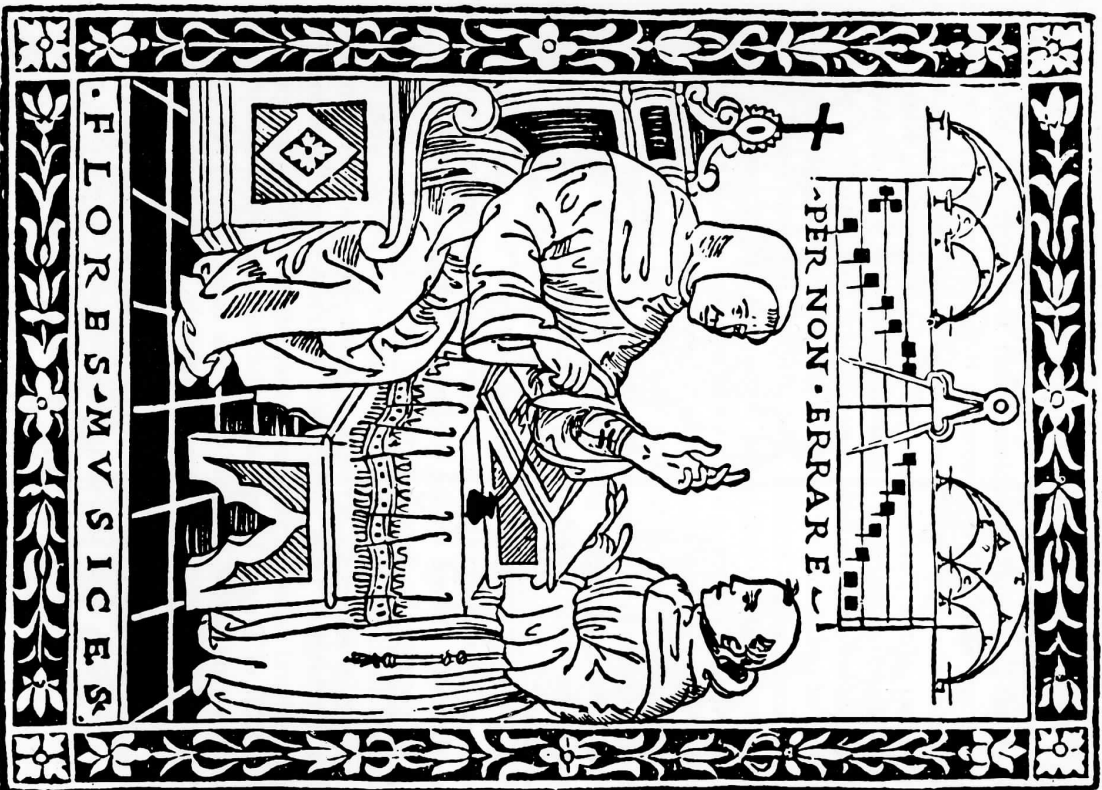




56. The harmonic scale. From Franchino Gafurio, *Theorica Musice* (Naples, 1480), title page. Woodcut.

harmonic proportion must be handled. More than this, even, its compact suggestiveness carried within itself a tendency towards harmonic proportion. In plate 55 Leonardo is using the Rule of Three for a problem about weights in a balance, and comes up with the four terms 6 8 9 (12): it is a very simple sequence that any merchant would be used to. But it is also the sequence of the Pythagorean harmonic scale—tone, diatessaron, diapente, and diapason—as it was discussed in fifteenth-century musical and architectural theory (plate 56). Take four pieces of string, of equal consistency, 6, 8, 9 and 12 inches long, and vibrate them under equal tension. The interval between 6 and 12 is an octave; between 6 and 9 and between 8 and 12 a fifth; between 6 and 8 and between 9 and 12 a fourth; between 8 and 9 a major tone. This is the whole basis of western harmony, and the Renaissance could note it in the form of the Rule of Three: Pietro Cunnuzio's *Rules of Music's Flowers* even put this notation of the harmonic scale at the top of its title page (plate 57), an invitation to the mercantile eye. In Raphael's *School of Athens* the attribute of Pythagoras is a tablet with the same motif numbered VI, VIII, IX, XII. The harmonic series of intervals used by the musicians and sometimes by architects and painters was accessible to the skills offered by the commercial education.

Of course, the danger here is of over-statement: it would be absurd to claim that all these commercial people went around looking for harmonic series in pictures. The point to be made is less forthright. It is, first, that Quattrocento education laid exceptional value on certain mathematical skills, on gauging and the Rule of Three. These people did not know more mathematics than we do: most of them knew less than most of us. But they knew their specialized area absolutely, used it in important matters more often than we do, played games and told jokes with it, bought luxurious books about it, and prided themselves on their prowess in it; it was a relatively much larger part of their formal intellectual equipment. In the second place, this specialization constituted a disposition to address visual experience, in or out of pictures, in special ways: to attend to the structure of complex forms as combinations of regular geometrical bodies and as intervals comprehensible in series. Because they were practised in manipulating ratios and in analysing the volume or surface of compound bodies, they were sensitive to pictures carrying the marks of similar processes. Thirdly there is a continuity between the mathematical skills used by commercial people and those used by the painter to produce the pictorial

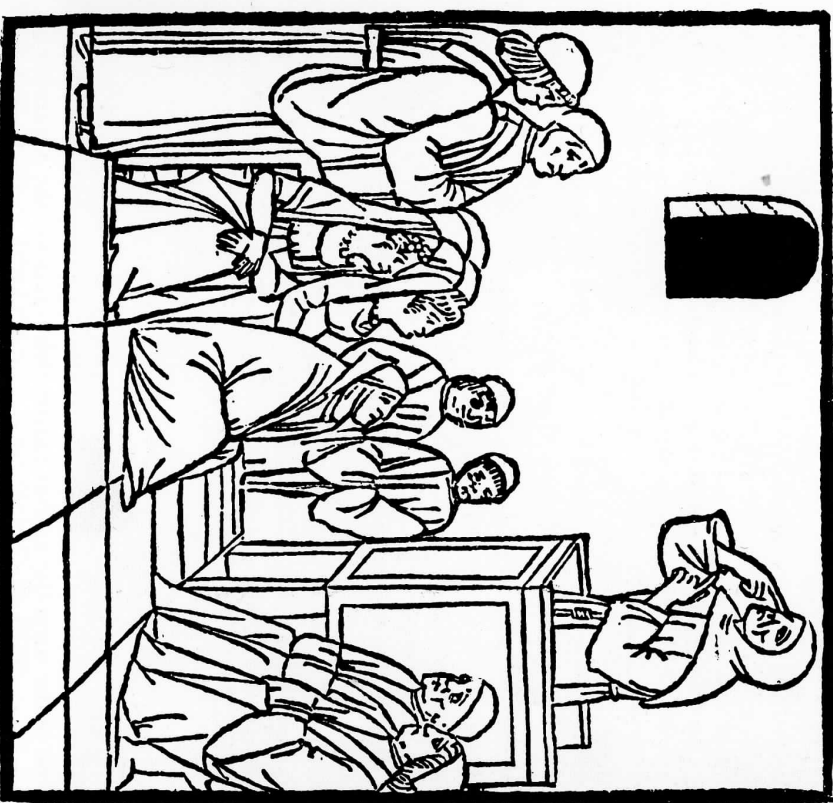


57. The harmonic scale. From Pietro Cannuzio. *Regule florum musicas* (Florence, 1510), title page. Woodcut.

proportionality and lucid solidity that strike us as so remarkable now. Piero's *De abaco* is the token of this continuity. The status of these skills in his society was an encouragement to the painter to assert them playfully in his pictures. As we can see, he did. It was for *conspicuous* skill his patron paid him.

II. This chapter has been becoming progressively more secular in its matter, but this may be a little deceptive. Indeed, it is possible that pictorial qualities which seem to us theologically neutral—proportion, perspective, colour, variety, for example—were not quite this. An imponderable is the moral and spiritual eye (plate 58), apt to interpret various kinds of visual interest in moral and spiritual terms. There are two kinds of pious Quattrocento literature which give hints, though no more than hints, about how this might enrich the perception of paintings. One is a type of book or sermon on the sensible quality of paradise, and the other is a text in which properties of normal visual perception are explicitly moralized.

In the first, vision is the most important of the senses, and the delights awaiting it in heaven are great. Bartholomew Rimberville's *Libro de locutio morale et spirituale* (Venice, 1496), title page. Woodcut.



tinus's *On the Sensible Delights of Heaven*, printed in Venice in 1498 and a very complete account of these matters, distinguishes three kinds of improvement on our mortal visual experience: a greater beauty in the things seen, a greater keenness in the sense of sight, and an infinite variety of objects for vision. The greater beauty lies in three particulars: more intense light, clearer colour, and better proportion (above all in the body of Christ); the greater keenness of sight includes a superior capacity to make discriminations between one shape or colour and another, and the ability to penetrate both distance and intervening solids. As another treatise with the same title, Celso Maffei's *On the Sensible Delights of Heaven* of 1504, summed up: 'Vision will be so keen that the slightest differences in colour and variations in form will be discernible, and it will not be impeded by distance or by the interposition of solid bodies.' The last of these notions is the strangest to us; Bartholomew Rimberrinus had explained the thinking behind it:

An intervening object does not impede the vision of the blessed . . . If Christ, even though himself in heaven after his Ascension, saw his dear Mother still on earth and at prayer in her chamber, clearly distance and the interposition of a wall does not hinder their vision. The same is true when an object's face is turned away from the viewer so that an opaque body intervenes . . . Christ could see the face of his mother when she was prostrate on the ground . . . as if he were looking directly at her face. It is clear that the blessed can see the front of an object from the back, the face through the back of the head.

The nearest mortal experience could come to this, perhaps, was through a strict perspective convention applied to a regular configuration, as happens in Piero della Francesca's drawing of a well-head (plate 59).

But in the second kind of text some aspects of our normal mortal perception are discussed. Peter of Limoges' *De oculo morali et spirituali* (*On the Moral and Spiritual Eye*) was a fourteenth-century book which had some vogue in Italy late in the fifteenth century: an Italian translation *Libro del occhio morale* was printed in 1496. Its programme was clear:

. . . many things are expounded in holy discourse relating to our vision and our physical eye. From this it is clear that a consideration of the eye and of such things as appertain to it is a very useful means of knowing more fully about the divine wisdom.

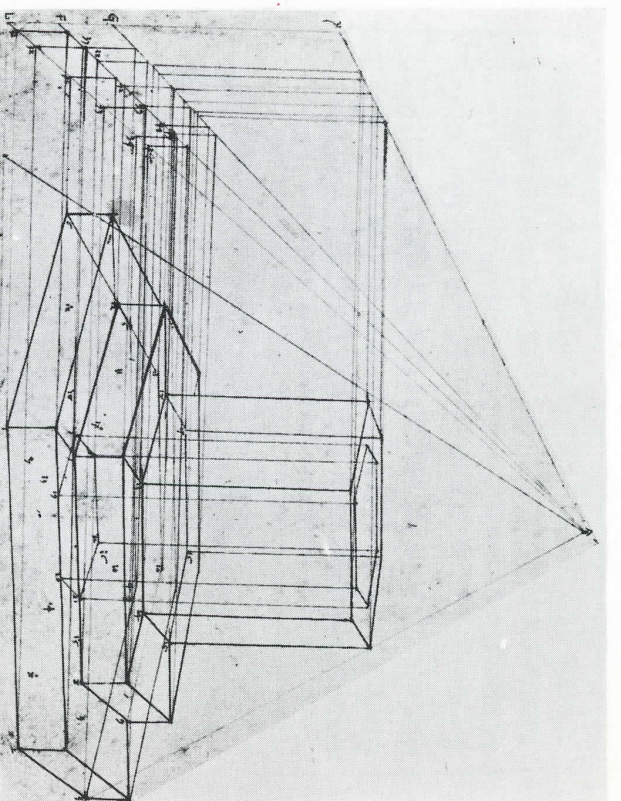
One of the ways the author carries this out is to take a number of familiar optical curiosities—that a stick half in water looks bent,



III. Masaccio. *St. Peter Distributing Alms*. Florence, S. Maria del Carmine. Fresco.



IV. Filippo Lippi. *The Holy Family with Sts. Mary Magdalen, Jerome and Hilarion* (about 1455). Florence, Uffizi. Panel.



59. Piero della Francesca. *A Well-head*. From *De prospectiva pingendi*, Parma, Biblioteca Palatina, MS. 1576, fol. 20 v.

for instance, and that if one puts a finger in front of a candle flame one sees two fingers—and moralizes them. He calls them ‘Thirteen marvellous things about the vision of the eye which contain spiritual information.’ The eleventh of the marvels is an example with a bearing on the perception of pictures:

The eleventh marvel of vision

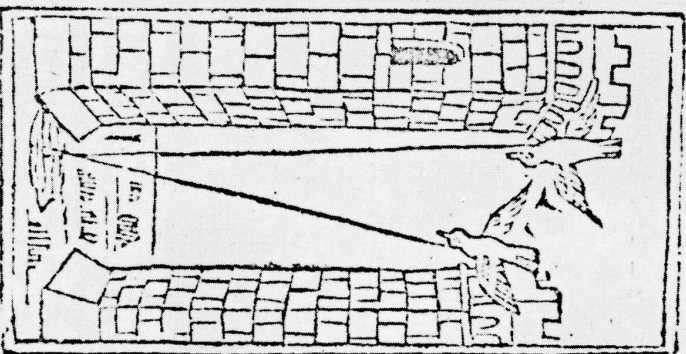
It is proved by the science of perspective that if one is deprived of direct rays or lines of sight, one cannot be sure of the quantity or size of the object one sees; on the other hand, one can make out its size very well if one does see it along direct lines of sight. This is clear in the case of objects seen now through air, now through water [the size of which is difficult to judge]. Similarly we can recognize a sin and realize its relative quantity from a man who looks at sin directly and with the eye of reason. A doctor of the church or other learned man looks straight at sin. . . . The sinner, however, when he commits sin does not recognize the exact degree of error of his sin, and does not look at it by direct line of sight but rather by an oblique and broken line of sight . . .

It would not be difficult to modulate this into a moralization of the Quattrocento painter’s linear perspective.

The basic principle of the linear perspective they used is in

Et sono dua torri in un piano che l'una e alta 80
braccia et l'altra e alta 90 braccia: et dal l'una tor
re all'altra e 100 braccia: et intra queste dua torri
e una fonte d'acqua in tal luogo che mouendosi
due uocegli uno di ciascuna et uolando di pari uolo
giugliono alla detta fonte auuolato. No sapere
quanto la fonte fara presto a ciascuna torre

80	90	100
80	90	100
6400	8100	10000
8100		
6400		
1700		
10000		
11700		
58 $\frac{1}{2}$		

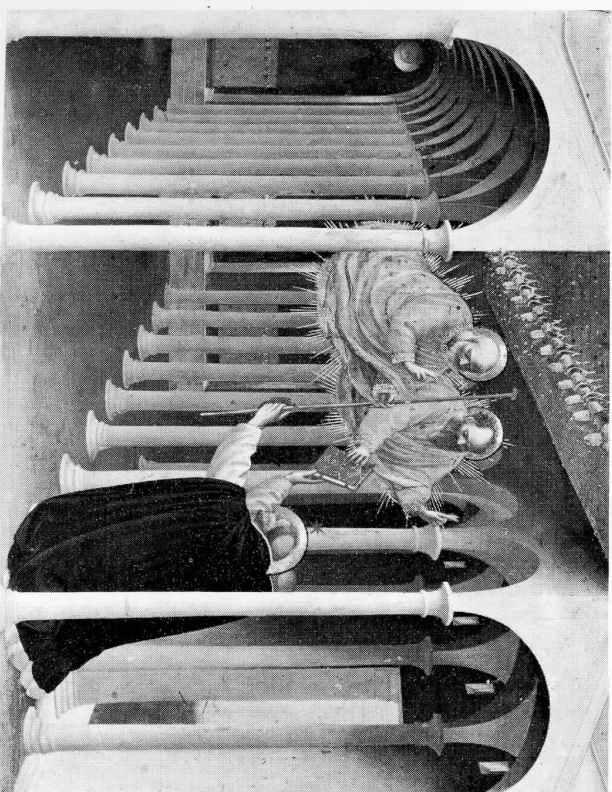


60. Surveying exercise. From Filippo Calandri. *De arithmetica* (Florence, 1491), p. o viii v.

fact very simple: vision follows straight lines, and parallel lines going in any direction appear to meet at infinity in one single vanishing-point. The great difficulties and complexities of this convention arise in detail, in practice, in consistency, and in the

modifications of the basic principle necessary if the perspective of a painting is not to seem tendentious and rigid: they present themselves to the painter and not to the beholder, unless the painting has gone wrong in its perspective and one wants to say why. Many Quattrocento people were quite used to the idea of applying plane geometry to the larger world of appearances, because they were taught it for surveying buildings and tracts of land. There is a typical exercise in Filippo Calandri's treatise of 1491 (plate 60). There are two towers on level ground. One is 80 feet high, the other 90 feet high, and the distance from one tower to the next is 100 feet. Between the towers is a spring of water in such a position that, if two birds set off one from each tower and fly in a straight line at the same speed, they will arrive at the spring together. One is to work out how far the spring is from the base of each tower. The key to the problem is simply that the two hypotenuses or bird-flights are equal, so that the difference of the squares of the two tower heights—1700—is the difference of the squares of the two distances of tower from spring. The idea of perspective, of imposing a network of calculable

61. Fra Angelico. *Sts. Peter and Paul Appear to St. Dominic* (from the predella of the *Coronation of the Virgin* (about 1440)). Paris, Louvre. Panel.



angles and notional straight lines on a prospect, is not outside the grasp of a man able to handle such an exercise in surveying.

If one brings these two types of thought together—geometrical experience enough to sense a conspicuous perspective construction, and a pious equipment for allegorizing it—one more shade in the Quattrocento painters' narrative performance suggests itself. Passages of perspective virtuosity lose their gratuitous quality and take on a direct dramatic function. Vasari picked out the foreshortened loggia in the centre of Piero della Francesca's *Annunciation* at Perugia as 'a beautifully painted row of columns diminishing in perspective'; it is very noticeable that many Quattrocento Annunciations, death scenes, and scenes of the visionary have something similar (plate 61). But, in terms of the pious culture we have been looking at, suppose such a perspective is apprehended not just as a *tour de force* but also as a type of visual metaphor, a device suggestive of, say, the Virgin's spiritual condition in the last stages of the Annunciation, as we have seen them in Fra Roberto's exposition. It is then open to interpretation first as an analogical emblem of moral certainty (*The Moral and Spiritual Eye*) and then as an eschatological glimpse of beatitude (*The Sensible Delights of Heaven*).

This sort of explanation is too speculative to have much historical use in particular cases. The point of noting here the harmony between the style of pious meditation in these books and the pictorial interest—proportionality, variety and clarity of colour and conformation—of some Quattrocento paintings is not to interpret individual works, but to remind us of the eventual impalpability of the Quattrocento cognitive style. Some Quattrocento minds brought a moral and spiritual eye of this kind to these paintings: there seems room in many of the paintings to exercise it (Colour Plate 1). It is proper to end this chapter on a faltering note.

III. Pictures and categories

1. It may be objected that the Quattrocento man invoked by this last chapter is just a church-going business man, with a taste for dancing. There are both offensive and defensive replies to this. The one is that, in any case, church-going and dancing business men did exist, included as unavoidable a Quattrocento figure as Lorenzo de' Medici, and are a more balanced and representative type of the Quattrocento man than some that are current—'civic humanists', for example. The soft answer is more complicated.

The social practices most immediately relevant to the perception of paintings are visual practices. A society's visual practices are, in the nature of things, not all or even mostly represented in verbal records. The church-going dancing trader is the aspect of the public eye that emerged from the sort of sources available for Chapter II. He is not offered as an ideal type, in any sense, but he has the elements of the matter in him—religion, politeness, affairs. No Quattrocento man of the painter-paying classes had none of these. A prince like Leonello d'Este may have been higher on politeness and lower on mathematics, but he had some of the latter; as a matter of fact, some of the princes most active as patrons of good painting—in particular Lodovico Gonzaga of Mantua, the employer of Mantegna and Alberti, and Federico da Montefeltro, Piero della Francesca's patron at Urbino—were quite highly trained in mathematics. A financier like Giovanni Rucellai was good at the Rule of Three and perhaps hardly danced at all, but he certainly absorbed his society's standards of decent social movement. For both kinds of man religious observance was institutional to the point of making the question of individual belief almost irrelevant.

Still, a great deal of the Quattrocento cognitive style most relevant to painting is not represented in Chapter II, and it is time to try a different approach. The reader will remember that Chapter I ended at an impasse, with an inability to read the Milanese agent's account of four painters working in Florence. In fact, if one looks back to the letter (p. 26) some of its problems

4. Pinturicchio and S. Maria de' Fossi: G. B. Vermiglioli, *Bernardino Pinturicchio* (Perugia, 1837) p. vi (Appendix II). Ghirlandajo and Giovanni Tornabuoni: C. S. Davies, *Ghirlandajo* (London, 1908) p. 171. Fra Angelico at Rome: E. Müntz, *Les Arts à la Cour des Papes*, I (Paris, 1878) p. 126. Piero della Francesca and the Madonna della Misericordia: G. Milanesi, *Nuovi documenti per la storia dell'arte toscana* (Rome, 1893) p. 91. Filippino Lippi at S. Maria Novella: A. Scharf, *Filippino Lippi* (Vienna, 1935) p. 88 (Document VIII). Signorelli at Orvieto: R. Vischer, *Luca Signorelli* (Leipzig, 1879) pp. 346-9. S. Antonino on differential payment of painters: S. Antonino, *Summa Theologia III*, viii. 4, many editions.

5. The Milanese agent's report on Florentine painters: P. Müller-Walde, 'Beiträge zur Kenntnis des Leonardo da Vinci', in *Jahrbuch der königlich Preussischen Kunstsammlungen*, XVIII, 1897, p. 165, and often reprinted.

II

2. Boccaccio on painting and illusion: Boccaccio, *Il Comento alla Divina Comedia*, ed. D. Guerri, III (Bari, 1918) p. 82 (Inferno XI. 101-5). Leonardo on the limits of illusion: Leonardo da Vinci, *Treatise on Painting*, ed. A. P. McMahon (Princeton, 1956) I, 177 and II 155 v. Vergerio on art appreciation: Petri Pauli Vergerii, *De ingenuis moribus et liberalibus studiis adolescentiae etc.*, ed. A. Gnesotto (Padua, 1918) pp. 122-3.

3. 'The beauty of the horse . . .': Giordano Ruffo, *L'arte de conoscere la natura dei cavoeel*, tr. G. Bruni, (Venice, 1493) pp. b. i v.-b. ii r.

4. John of Genoa: Joannes Balbus, *Catholicon* (Venice, 1497) p. V. v r. (s.v. Imago).

- Fra Michele da Carcano: *Sermones quadragesimales fratris Michaelis de Mediolano de decem preceptis* (Venice, 1492) pp. 48 v.-49 r. (Sermo XX, De adoratore). For the quotation from St. Gregory, see Gregory, Epistulae, XI. 13 (*Patrologia Latina*, LXXVII, 1128); the letter was written in 787 to Serenus the iconoclast Bishop of Marseilles.

- The miraculous St. Antony: Sico Polentone, *Sancti Antonii Confessoris de Padua Vita* (Padua, 1476) p. 41 v.

- Salutati on idolatry: Coluccio Salutati, 'De fato et fortuna', Vatican Library, MS. Vat. lat. 2928, fols. 68 v.-69 r.; printed in M. Baxandall, *Giotto and the Orators* (Oxford, 1971) p. 61 n. 21.

- S. Antonino on the faults of painters: S. Antonino, *Summa Theologiae*, III. viii. 4, many editions. The passage has been printed and discussed by C. Gilbert, 'The Archbishop on the Painters of Florence, 1450', *Art*

- Bulletin*, XLI, 1959, 75-87.
The medieval background to image theory: S. Ringbom, *Icon to Narrative* (Åbo, 1965) pp. 11-39.

5. The Garden of Prayer: *Žardino de Oration* (Venice, 1494) pp. x. ii v.-x. iii r. (Cap. XVI. Chome meditare la vita di christo . . .).

- Fra Roberto: Robertus Caracciolus, *Sermones de laudibus sanctorum* (Naples, 1489) pp. lxxv r.-lxxvii r. (Nativity), cxxix r.-clii r. (Annunciation), cliv r.-cliv r. (Visitation). A number of other saints are the subject of useful sermons in the second part of the book; for instance, St. George (clviii r.), St. Antony Abbot (cxc r.) and St. Catherine of Siena (ccx r.).

- Leonardo on violent Annunciations: Leonardo da Vinci, *Treatise on Painting*, ed. A. P. McMahon (Princeton, 1956) I, 58 and II, 33 r.

6. Lentulus's description of Christ: a Renaissance translation of a Greek forgery popular in the fifteenth century and printed in, for example, *Žardino de Oration* (Venice, 1494) p. s. iv r.-v.

- The Virgin's colouring: Gabriel de Barletta, *Sermones celeberrimi*, I (Venice, 1571) 173.

- Eyes as the windows of the soul: Galeottus Martius, *De homine* (Milan, 1490) p. a. iii v.

- Leonardo on physiognomy: Leonardo da Vinci, *Treatise on Painting*, ed. A. P. McMahon (Princeton, 1956) I, 157 and II, 109 v.

- Alberti on movement: L. B. Alberti, *Della pittura*, ed. L. Malle (Florence, 1950) p. 95.

- Guiglielmo Ebreo on movement: *Trattato dell'arte del ballo di Guiglielmo Ebreo Pesetese*, ed. F. Zambirini (Bologna, 1873) p. 7.

- Leonardo on movement: *Treatise on Painting*, ed. cit., I, 148-57 and II 48 r.

- Monks' gestures: G. van Rijnberk, *Le langage par signes chez les moines* (Amsterdam, 1954) which collates the surviving lists.

- Preachers' gestures: *Tractatus solennis de arte et vero modo predicandi* (Strasbourg, n.d.) p. a. ii r. and v.; Thomas Waleys, 'De modo componendi sermones', reprinted in T.-M. Charland, *Artes praedicandi* (Paris, 1936) p. 332; Mirror of the World, ca. 1527, cit. in W. S. Howell, *Logic and Rhetoric in England 1500-1700* (Princeton, 1956) 89-90.

7. Religious drama: see A. d'Ancona, *Origini del teatro italiano*, 2nd ed., I (Turin, 1891) especially pp. 228 (Matteo Palmieri on the 1454 St. John's Day pageant), 251 (on the Russian Bishop and the Ascension play of 1439) and 423 (on *festaiuolo* and *sedie*).

- Abraham and Hagar*: printed in A. d'Ancona, *Sacre rappresentazioni dei secoli XIV, XV, e XVI*, I (Florence, 1872) 1-41 and especially p. 13.

- Domenico da Piacenza's dancing treatise: 'De arte saltandi et choras ducenti', Bibliothèque Nationale, Paris, MS. it. 972, fols. 1 v.-2 r. A guide to the dancing treatises is A. Michel, 'The earliest dance-manuals', *Medievalia et Humanistica*, III (1945) 119-24.

Angelo Galli on Pisanello: Vasari, *Le vite*; I, *Gentile da Fabriano ed il Pisanello*, ed. A. Venturi (Florence, 1896) pp. 49–50.
Cupid, Phoebus, Venus, Jealousy: all in *Trattato dell' arte del ballo di Guglielmo Ebreo Pearce*, ed. F. Zambini (Bologna, 1873) pp. 47–8, 50–2, 65–8, 95–7.

8. Colour codes: S. Antonino, *Summa Theologiae*, I. iii. 3; L. B. Alberti, *Della pittura*, ed. L. Mallet (Florence, 1950) p. 63, and S. Y. Edgerton Jr., 'Alberti's colour theory', *Journal of the Warburg and Courtauld Institutes*, XXXII, 1969, 109–34; on Leonello d'Este's clothes, Angelo Decembrio, *De politia literaria* (Basle, 1562) p. 3.

Lorenzo Valla against colour symbolism: Epistola ad Candidum Decembrem, in *Opera* (Basle, 1540) pp. 639–41, and Baxandall, *Giotto and the Orators* (Oxford, 1971) pp. 114–16 and 168–71.

Filarete on hues: Filarete, *Treatise on Architecture*, ed. J. R. Spencer (New Haven, 1965) I, 311 and II, 182 r.

Alberti on colour harmonies: *Della pittura*, ed. cit., pp. 101–2.

9. Schools: a short and well documented account in C. Bec, *Les marchands écrivains* (Paris-Hague, 1967) pp. 383–91.

Piero della Francesca on gauging a barrel: Piero della Francesca, *Trattato d'abaco*, ed. G. Arrighi (Pisa, 1970) p. 233.

Gauging: the clearest printed handbook is Filippo Calandri, *De arithmetica* (Florence, 1492) which is illustrated (see plates 47, 53, 60). There is a fine illuminated manuscript of this book made for Giuliano di Lorenzo de' Medici in the Biblioteca Riccardiana, Florence, MS 2669. The many manuscript handbooks have not been listed, but for a survey of some of those in Milanese libraries see A. Fanfani, 'La preparazione intellettuale et professionnelle à l'activité économique en Italie du 14e au 15e siècle', *Le Moyen Age*, LVII, 1951, 327–46.

10. Onofrio Dini's problem: Luca Pacioli, *Summa de arithmetica* (Venice, 1494) p. 158 r.

Piero della Francesca on the Rule of Three: *Trattato d'abaco*, ed. cit., p. 44. For printed accounts of the Rule of Three see P. Borgia, *Arithmetica* (Venice, 1484) (also 1488, 1491, 1501); Frances Pellos, *Compendio de lo abaco* (Turin, 1492); F. Calandri, *De arithmetica* (Florence, 1492); and for a clear modern explanation of the rule, D. E. Smith, *History of Mathematics*, II (Boston, 1925) 477–94.

Harmonic proportion: for a clear and accessible account of its visual application, R. Wittkower, *Architectural Principles in the Age of Humanism*, 3rd. ed. (London, 1962) especially pp. 103–10.

11. The sensible delights of paradise: Bartholomeus Rimberrinus, *De deliciis sensibilibus paradisi* (Venice, 1498) pp. 15 v–26 r.; Celsus Maffeus, *De sensibilibus deliciis paradisi* (Verona, 1504) especially pp. A viii v–B ii r.

The moral and spiritual eye: Petrus Lapepiera [Lemovicensis], *Libro de oculo morali* (Venice, 1496); *Libro de locho morale et spirituale* (Venice, 1496) especially pp. A iii r. and A vii r.–b vii v. See also A. Parronchi, 'Le fonti di Paolo Uccello, II, I "filosofi"', *Studi su la dolce prospettiva* (Milan, 1964) pp. 522–6.

III

1. Lancioti's poem: Francesco Lancioti, *Trattato di pittura* (Rome, 1509) p. a. iii r.; and (Ancona, 1885) p. 5.

The four corporal gifts of the Blessed: the idea of these derived from St. Augustine and they are expounded in many Quattrocento books and sermons: for instance, Matteo Bossi, *De veris ac salutaribus animi gaudiis* (Florence, 1491).

2. Giovanni Santi: the complete *Cronaca rimata* has been edited by H. Holzinger (Stuttgart, 1893). The verses on painters are taken here from the transcription in Lise Bek, 'Giovanni Santi's "Disputa della pittura"' — a polemic treatise, *Analedda romana instituiti Danici*, V, 1969, 75–102. For Santi as a painter, see *Mostra di Melozzo e del Quattrocento romagnolo*, *Catalogo* (Forlì, 1938) pp. 53–7.
Netherlandish painting in Italy: R. Weiss, 'Jan van Eyck and the Italians', *Italian Studies*, XI, 1956, 1 ff. and XII, 1957, 7 ff.

3. Cristoforo Landino: on Landino in general, see M. Santoro, 'Cristoforo Landino e il volgare', *Giornale storico della letteratura italiana*, CXXXI, 1954, pp. 501–47.

Landino on Alberti: *Comento di Christophoro Landino forentino sopra la comedia di Dante Alighieri* (Florence, 1481) p. iv r.

Landino's Pliny: C. Plinius Secundus, *Historia naturale*, trs. C. Landino (Rome 1473) and later editions.

Landino on the artists: 'Florentini excellenti in pictura et sculptura', *Comento*, ed. cit., p. viii r. See also O. Morisani, 'Art Historians and Art Critics', III, Cristoforo Landino, *Burlington Magazine*, XCV, 1953, p. 267.

4. (a) *imitatore della natura*: Leonardo da Vinci, *The Literary Works*, ed. J. P. Richter, I (Oxford, 1939) 372 and *Treatise on Painting*, ed. A. P. McMahon (Princeton, 1956) I, 41 and II, 24v–25r. For representative classical and renaissance contexts for the phrase see Pliny, *Natural History*, XXXIV, 61 (natura ipsa imitanda esse) and Lorenzo Ghiberti, *I commentarii*, ed. J. v. Schlosser, I (Berlin, 1912) p. 48 (II. 22): 'mi ingegnai con ogni misura osservare in esse [the Gates of Paradise] cercare imitare la natura quanto a me fosse possibile'.

(b) *rilievo*: Alberti, *Della pittura*, ed. L. Mallet (Florence, 1950) pp. 98–