

AN ASPECT OF NATURALISM:  
PLANT AND ANIMAL ILLUSTRATION IN ITALIAN  
MANUSCRIPT ART FROM THE THIRTEENTH TO  
THE EARLY FIFTEENTH CENTURIES

by

Kathy E. Zimon

THESIS SUBMITTED IN PARTIAL  
FULFILLMENT OF THE REQUIREMENTS FOR THE  
DEGREE OF MASTER OF ARTS  
IN THE DEPARTMENT OF FINE ARTS

We accept this thesis as conforming  
to the required standard:

Faculty Advisor \_\_\_\_\_

Head, Fine Arts \_\_\_\_\_

THE UNIVERSITY OF BRITISH COLUMBIA

April 1970

In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study.

I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the Head of my Department or by his representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Department of FINE ARTS

The University of British Columbia  
Vancouver 8, Canada

Date April 30, 1970

### ABSTRACT

The subject of this study is the phenomenon of plant and animal illustration as an aspect of naturalism in Italian manuscript art from the mid thirteenth century to the early fifteenth century.

'Naturalism' in the context of this study is defined as the accurate representation of natural objects within the given limitations of period and style. In addition, the term is also applied to the phenomenon of the more frequent occurrence of natural objects like plants and animals in manuscript art.

Chief among the factors that gave rise to this type of illustration were the demands of medieval science, in terms of practical works like herbals and hunting treatises. Secondly, the secular interests of the courts, in particular Frederick II's court in the thirteenth century, and the courts of the North Italian despots in the fourteenth and fifteenth centuries encouraged the pastimes that generated a need for naturalistic illustration. Although Franciscanism has traditionally been credited with stimulating naturalism in Italian art, there is no solid evidence to suggest that the limited aspect of naturalism discussed here was directly influenced by the movement.

The accurate portrayal of both plants and animals can be documented in a number of manuscripts dating from the thirteenth,

fourteenth, and early fifteenth centuries. The concentration on accurate portrayal of isolated natural objects resulted in a more sophisticated and at the same time more naturalistic recording of facts about both plants and animals. Eventually, this close observation of nature contributed to certain rudimentary developments toward the mastery of landscape and pictorial space.

These developments coincided with, or perhaps even encouraged, the acceptance of the International Gothic Style in Italy. This style incorporated some of the aspects of naturalism discussed in this study, and introduced them into a part of the mainstream of Italian art in the fifteenth century.

## TABLE OF CONTENTS

	Page
INTRODUCTION	1
I. CONTRIBUTING FACTORS TO NATURALISM	6
II. ANIMALS AND PLANTS IN MANUSCRIPT ILLUSTRATION	20
III. CONTRIBUTIONS OF THIS ASPECT OF NATURALISM	45
CONCLUSION	63
FOOTNOTES	68
BIBLIOGRAPHY	78

## INTRODUCTION

The subject of this study is the origin and development of plant and animal illustration in Italian manuscript art as an aspect of naturalism from the thirteenth to the early fifteenth centuries.

'Naturalism' is a popular term in art historical scholarship, but it is seldom defined with precision. In fact, the very free use of the words 'naturalism' and 'naturalistic' suggests that their meanings are sufficiently ambiguous and relative that they can be used with impunity to describe the most varied and contradictory phenomena, chronologically ranging from Paleolithic cave painting through Gothic sculpture to the Flemish primitives, and from Renaissance painting to the nineteenth century and Courbet.

A precise explanation may be lacking because 'naturalism' is considered self-explanatory, needing no definition. Yet on reconsideration, only two facts appear to be obvious about the term: it can only be applied to representational art, and it always denotes an opposition to that which is abstract, geometric, idealized, or purely symbolic in form.

Normally, naturalism implies an attempt to accurately represent nature, including man and his works, especially as to their

visible appearance and observable behaviour.<sup>1</sup> In this sense, naturalism is sometimes identified with realism, while at other times, it is distinguished from it, favourably as being more objective about appearances, and unfavourably as being less sensitive to symbolic or poetic realism which can depart from superficial appearances to express a deeper level of reality.<sup>2</sup> Of course, the application of this meaning depends on one's conception of nature and reality as well as of the aim and value of the art of the period under discussion.

During the Romanesque period, art tended toward symbolic abstraction and the distortion of natural appearances for the sake of spiritual expressiveness. During the Gothic period, however, there began a shift in emphasis from abstract and symbolic representation to a more accurate observation of the physical world. This change accelerated during the two centuries under discussion here, and for the purpose of this study, 'naturalism' will therefore be considered to mean the attempt to more accurately represent the visible world within the given limitations of the period and style. The term will also imply a strong preoccupation with the rendering of factual observation of nature and natural objects for their own sake.

During the greater part of this period of change, the bulk of artistic production was still in some way related to religion and the Church, and its object was the exposition of the Christian dogma. The representation of man and his life on earth amid his natural environment tended to be incidental to the main purpose of art. Gradually, however, the incidental subject of man's surroundings

became more frequently represented and was depicted in more detail and with keener observation than previously.

Therefore, in the context of this study the term 'Naturalism' will denote not only the more accurate representation of the natural world, but also the phenomenon of the more frequent representation of natural objects and man's greater interest in the world and its creatures about him.

While it is possible to define what we today understand to be naturalism, the problem remains whether such a concept was ever formulated during the two centuries in question, and if so, what was meant by it. The sources to investigate are few: Ghiberti's Commentarii<sup>3</sup> (possibly written toward the end of his life, i.e. near 1455), generally concerned with the naturalism of the human figure, appears too late to clarify the concepts of an earlier period. Similarly, Alberti's Della Pittura<sup>4</sup>, finished in 1436, does not furnish any clues to the ideas concerning nature or naturalism in the 14th century, but already foreshadows the concerns of the quattrocento proper.

The only available source, therefore, is Cennino Cennini's Il Libro dell'Arte<sup>5</sup>, written around 1390 or a little later, which is really the earliest technical treatise on painting, and in it one finds traces of what may possibly be interpreted as a mention of naturalism.

In a chapter entitled "How more than from the master, you should draw continuously from nature", the following passage occurs:



4

Remember that the most perfect guide that you can have and the best course is the triumphal gateway of drawing from nature; it is before all other example, and with a bold heart you may always trust to it.<sup>6</sup>

One must remember that Cennini was a practising painter, and his book is a technical treatise intended to instruct in the practical art of painting, and not a statement of artistic theory. Specifically because it has no literary pretensions, Cennini's statement attests to the value that his age placed on studying nature. His advice to draw from nature is not qualified by any references to ideals of beauty or antique examples as in Ghiberti's and Alberti's writings. Cennini even prefers nature first-hand rather than through the eyes of a master, presumably because of the greater accuracy of the former method. Although he believed that the human body should be drawn according to certain measurements, i.e. it should be nine heads tall,<sup>7</sup> he believed that 'irrational animals' had to be drawn from nature in order for the artist to achieve a good style.<sup>8</sup> When one comes to a passage in chapter 86 that advises, on the painting of trees, to "let the leaves shoot above (the branches) and then put the fruits, and scatter a few flowers and birds on the green grass,"<sup>9</sup> it is possible to draw a parallel between this description and the evidence of late Gothic painting in northern Italy around the turn of the fifteenth century. Considering examples of, say, Lombard manuscript illustration, it is possible to deduce that Cennini's 'naturalism' refers to what I have earlier called an attempt to more accurately represent natural appearances, and that a part of this attempt

included the keener and closer observation of detail. Minor points, such as the advice on how to draw mountains "so that they appear natural" by copying large rough stones, also are indications that his type of artistic vision was content to let the minutiae of nature represent the features of the macrocosm.

It would be dangerous to speculate further on Cennini's meaning, since it is too easy to read selectively between the lines and to arrive at an 'a priori' conclusion that supports our own understanding of the term 'naturalism'. The indications are there, however, and the frequent mention of detail, as well as the numerous exhortations to observe 'nature', are clues that at the very least suggest that if the term 'naturalism' had existed at the time, its meaning may not have been too far from what we understand by it today.

## CHAPTER I

### CONTRIBUTING FACTORS TO NATURALISM

During the two centuries under discussion here, the phenomenon of naturalistic plant and animal illustrations in manuscripts occurred with increasing frequency. While a number of factors can be isolated as causes for this phenomenon, the empirical science of the Middle Ages, and its requirements, has to be singled out as an important initial stimulus to the naturalistic representation of plants and animals.

It is in what we would today call the biological sciences (biology, botany, and zoology) that the empirical method of the Middle Ages made its significant contribution to the cause of naturalism.

Until the thirteenth century, the chief interest of western Christendom in plants had been for their medicinal properties, and in animals for their symbolism in moral and spiritual teaching.<sup>1</sup> The writings of St. Augustine, perhaps the most important influence in forming the mind of medieval man before the thirteenth century, looked on the natural world as a sacrament, an outward and visible sign of supernatural significance: the moon was the image of the Church reflecting the divine light; the wind

was a symbol of the holy spirit; the sapphire bore a resemblance to divine contemplation. The preoccupation with symbols was reinforced by the allegorical zoology of such texts as the Physiologus, a Greek work of Alexandrian origin written in the second century A.D. in which stories about animals were used to illustrate points of Christian doctrine. To name just one example, the phoenix was a symbol of the risen Christ because it rose out of its own ashes. The Physiologus was translated into Latin in the fifth century and became the primary source of all illustrated bestiaries in the western world.<sup>2</sup>

Scientific biology became established in the thirteenth century, alongside this world of symbols. By the early twelfth century, a writer like Adelard of Bath could consider authority as a restraint, and God an explanation of natural causes only when all others have been eliminated.<sup>3</sup> The main source for this new, scientific and realistic temper was the recovery of Greek and Arabic texts, such as the works of Aristotle, which had become available in Latin translations (by way of Arabic and Hebrew) by the beginning of the thirteenth century.

Of the scientific writings of the thirteenth century, those of Albertus Magnus (1193? 1205-1280) on botany and zoology are outstanding examples. Besides containing accurate descriptions of the anatomy and habits of plants and animals, including insects and birds, they also attempt to answer general biological questions of ecology and reproduction, based on experience rather than authority.<sup>4</sup>

These writings probably did more than those of any other doctor of his day to introduce the natural sciences into the course of public and private studies.<sup>5</sup> Albert's scientific spirit was not unique, but he was perhaps closer than any of his contemporaries to the modern view. For example, he ascribes the deluge to God's will, but believes that God acts through natural causes in the case of natural phenomena, and that these natural causes (divine instruments) could be investigated freely. His interest in specific things is also more keen: "it is not enough to know in terms of universals but we seek to know each object's own peculiar characteristics, for this is the best and perfect kind of science."<sup>6</sup> Albert, like all medieval writers of his period, draws on previous sources, especially on Aristotle, but he goes beyond them, especially in his work on animals. Where he discusses the general natures and common characteristics of animals he follows Aristotle closely, but in those books where he lists and describes particular animals, he makes numerous allusions to recent experience and criticizes past authorities.

Albert himself felt that the desire to describe particular objects precisely was not in accord with traditional philosophic methods of presentation, but it was obviously a desire that many of his contemporaries shared with him. At the beginning of his sixth book on vegetables and plants, where he lists particular herbs and trees, he explains: "we satisfy the curiosity of our students rather than philosophy, for philosophy cannot deal with particulars."<sup>7</sup> With Albert, personal observation and experience, the basic requirements

of scientific inquiry, are alone reliable concerning particular natures.

The early thirteenth century writings of Thomas of Cantimpré also show a trace of this scientific spirit. In his *De Natura Rerum*, he includes his own observations alongside the more conventional book about fabulous beasts. Frederick the Second's own text on Falconry is a compendium of empirical knowledge, and does not hesitate to describe other treatises on the subject as "lying and inadequate". The treatise is based on Aristotle (whom Frederick called a man of books) and various Moslem sources, but goes on to describe the anatomy and habits of birds, the rearing and feeding of falcons, the training of dogs for hunting with them, the various types of falcons, as well as the cranes, herons, and other birds that were hunted. Frederick watched and questioned Saracen falconers, observed the nests of herons, cuckoos and vultures, and exploded the popular legend that barnacle geese were hatched from barnacles on trees.<sup>8</sup> The circle of natural philosophers and magicians who were kept at Frederick's court can also claim a treatise on horse diseases.<sup>9</sup> Other biological works of the period were also written to be useful. Walter of Henley wrote on agriculture, as did Peter of Crescenzi early in the fourteenth century, whose work remained a standard for three hundred years.<sup>10</sup> Herbals, the main purpose of which was to describe medically valuable plants in a way that they could be easily recognized, also belong to this category of useful scientific works. The thirteenth century herbal of Rufinus is an outstanding example.<sup>11</sup> Travellers to foreign

lands also contributed to the pool of knowledge about plants and animals. Albertus Magnus himself, who travelled long distances on foot<sup>12</sup>, gave an account of whaling and fishing in his De Animalibus<sup>13</sup>. The Icelandic Speculum Regale also describes whales, seals and walruses. Famous travellers like Marco Polo also brought back descriptions of new creatures such as the wild asses of Siberia, of fat-tailed sheep, and of new plants such as rice and ginger.<sup>14</sup>

At least a few of the texts that resulted from this type of knowledge and investigation were generally illustrated, especially the herbals, and occasionally the practical treatises like Frederick's of falconry.

However, because of the way in which books were reproduced for copying, the illustrations included in both botanical and zoological works were often stylized copies of earlier versions, which, in the case of herbals, often went back even to classical times.

As early as the twelfth century, there are instances of naturalistic attempts at illustrating manuscripts. The Herbal of Apuleius Barbarus<sup>15</sup> written perhaps at Bury St. Edmunds about 1120, contains for example, a painting of a bramble, decoratively disposed in an S shape on the page, which appears to be drawn from nature. A late twelfth century manuscript<sup>16</sup> has a drawing of an ants' nest among wheat which shows an attempt at observing nature first-hand, in spite of the discrepancy in size between wheat stalk and insect, and the schematic character of the drawing.

From the thirteenth century on, drawings and paintings of living creatures increased both in quantity and accuracy, both as illustrations in scientific works and as decorations in the borders of various manuscripts that had no relation to the subject of the texts. Such an isolated example as Villard de Honnecourt's sketch-book also contains drawings of animals and birds, although often posed in heraldic groupings.<sup>17</sup> The famous lion "fut contrefais al vif"<sup>18</sup> is rather too confined by the artist's attempt to make its parts conform to geometry,<sup>19</sup> while the rendering of two parrots on a perch is more successful.<sup>20</sup>

For the most part, the naturalistic illustration of animals made in the thirteenth and fourteenth centuries were decorative in intention, and accompanied no text as scientific exposition. In many instances, the close and accurate observation of nature might have been directly inspired by religious symbolism, but the symbols tended to be less specific, and the religious motive found expression in the contemplation of nature as a whole. Vincent of Beauvais, the medieval encyclopedist, less a personal observer of nature, and less discriminatory in his scientific attitudes than Albertus Magnus, said in the prologue to his *Speculum Maius*: "I am moved with a spiritual sweetness towards the Creator and Ruler of this world, because I behold the magnitude and beauty and permanence of his creation."<sup>21</sup> The beautiful naturalistic carvings of plants on the capitals of Gothic cathedrals (Notre Dame, Sens, Laon, Rheims) where the forms are simplified but not distorted, and



many of which Emile Mâle has been able to identify as the native flora and fauna of the Ile-de-France region, reflect the same spirit that is expressed by Vincent of Beauvais. As Mâle says, the Middle Ages "gazed at every blade of grass with reverence."<sup>22</sup> Animals appear similarly without didactic purpose on various parts of the cathedrals, and are carefully observed and given their characteristic movements.<sup>23</sup> The cathedral of the Middle Ages was an epitome of the world; on and within it the sculptors wished to represent every living thing, both real and observed from nature, and those that lived only in their imagination.

Another contributing factor to the phenomenon of naturalistic plant and animal illustration was the cultural milieu of the courts, in particular in the southern realm of Frederick II Hohenstaufen, and later on at the courts of the despots in the North Italian states. Basically these courts had a wide range of secular interests, especially scientific interests, that often centered on hunting and allied sports that generated curiosity and knowledge about animals.

During the reign of Frederick, the court at Palermo was the leading cultural centre. In many ways, Frederick could be considered as the prototype of the later Renaissance despots who patronized the arts to enhance their own glory. Frederick, however, was not merely a patron but a participant as well, and his inquiring and intransigent mind dominated the scholars who were attracted to his court. Chief among his interests were law, astrology, medicine,

literature and hunting, with the latter interest resulting in his famous treatise on falconry.<sup>24</sup> This treatise, still an excellent introduction to falconry, proves that Frederick was a keen observer of nature, and contributed toward dispelling some popular misconceptions about the habits of birds. He also collected a zoo, and kept exotic animals like lions, elephants, and even giraffes. He was insatiably curious, and experimented both with humans and animals, although these generally did not result in significant discoveries. The real contributions, aside from his own falconry treatise, were made by some of the scholars he attracted to his court from as far afield as Moslem Africa and the Greek speaking east. Since he himself spoke many languages, had friendly relations with the Sultan, and tolerated both Jews and Moslems, the atmosphere at his court was particularly receptive to the enlightening influence of Arabic science.

This variety of interests led of course to literary production. Whether Frederick was as prolific a patron of the visual arts as of vernacular poetry and science, has not been sufficiently documented, but the above mentioned falconry treatise suggests that the commissioning of illustrated manuscripts may not have been uncommon.

The northern Italy of circa 1400 shared some common characteristics with the nearly oriental splendour and variety of Frederick's court at Palermo. The two cultural spheres had a greater affinity to each other than to the intervening Gothic period.<sup>25</sup>

The cosmopolitan court of the Visconti in Milan and the smaller feudal lords of the neighbouring regions had similar secular preoccupations, and were prolific art patrons. The Visconti can be taken as representative of the type of rulers who could afford to sponsor art. The dynasty was established early in the fourteenth century, when the condottiere Francesco Sforza usurped control. The height of Milanese power and territorial expansion under Gian Galeazzo Visconti (1385-1402), who purchased the title of duke from Emperor Wenceslas in 1395<sup>26</sup>, and aspired by means of violence and treachery to control Italy<sup>27</sup>, was accompanied by considerable artistic production. Especially secular art was produced on an unprecedented scale, both in quantity and quality.<sup>28</sup> No doubt the wealth of Milan under the businesslike administration of the Visconti, particularly of Gian Galeazzo, was an important factor.<sup>29</sup> That the secular arts should be emphasized at despotic courts, where the aggrandizement of the ruler was a necessary expense, comes as no surprise. Calculated magnificence, as an investment in power, included at this period (as even in the fifteenth century) the maintenance of scholars and poets, the collection of libraries and the production, copying and illustration of books. Lombard miniaturists specialized in the illustration of secular books, and this category of art gradually established new aesthetic canons that opened the way for new artistic pursuits, such as specialization in the portrayal of animals.

Medieval science, and the pseudo-scientific and secular interests of the courts and cultural centres both were contributing factors in the development of naturalism. In addition, earlier medieval art of course contains numerous examples of accurately observed, naturalistic detail, especially in the sculptured foliated capitals of the previously mentioned cathedrals. Arabic art, too, may have furnished examples in manuscript form, probably in herbals or in other medical texts, that may have served as models for naturalistic illustrations of plants or animals, but it is difficult to ascertain just how many of these manuscripts were in fact available. We know that Arabic texts began to be translated in the twelfth and thirteenth centuries, but little attention has been paid to whether these texts were illustrated, and if they were, whether they represented an important influence. Often the only clue available is a trace of oriental style that occurs in some western manuscript, as in that of Cybo d'Hyères, discussed in the next chapter. If stylistic qualities could be transmitted, then content as well, in the form of realistic plant and animal studies may also have been transmitted, but whether the Arabic manuscript illustrations were in fact more naturalistic than their contemporary western counterparts is a debatable point, and only a thorough and exhaustive comparative examination could resolve it.

Similarly, it would be very difficult to ascertain if any classical or late classical illustrated manuscripts had served as

models or stimuli for more naturalistic plant or animal studies in the thirteenth and fourteenth centuries. Here the only evidence is to be found in herbals, discussed in the next chapter. A few isolated examples like the Anicia Juliana Codex suggest, but cannot adequately prove, that other classical herbals might have influenced plant portrayal during the period in question. Although Pliny<sup>30</sup> makes numerous references to the degree of naturalism attained in animal portrayal in classical times, at least in the media of bronze and marble, there is no evidence that enough examples survived to be emulated. The capitoline wolf and the horse of the Marcus Aurelius monument are two examples that come to mind, but these are isolated, and in the case of the Marcus Aurelius at least, the emulation did not come until well into the fifteenth century. Moreover, it would be dangerous to use the evidence of surviving statuary to support naturalistic illustration in manuscripts, since the two media make rather different, if not sometimes incompatible, requirements of the artist.

Aside from medieval science and the other factors discussed above, one other has to be assessed as a possible contribution to the aspect of naturalism under discussion, if only because it has traditionally been linked to the whole concept of naturalism and the birth of Renaissance art.

Since 1864, when Hippolyte Taine<sup>31</sup> first tried to explain the serenity of Raphael's madonnas by the influence of Perugia

and Assisi, St. Francis and his movement as a determining factor in Renaissance art seems to have fascinated art historians.

Following Taine, both Ruskin and Hermann Hettner linked the influence of St. Francis and the florescence of Italian painting. Hettner in particular, stressed the influence of Franciscan literature on the fine arts and iconography.<sup>32</sup>

In the 1880's, Ernest Renan in an essay,<sup>33</sup> and Henry Thode in an extensive study,<sup>34</sup> enlarged upon the theme of Franciscanism as a foundation of Renaissance art. Basically, Thode's thesis rested on two main points: first, that Franciscan thought and teaching was the spiritual foundation and necessary complement to the expansion of the burgher classes and the rise of the towns, and second, that St. Francis, in changing the religious outlook of medieval man, helped to establish the new, world-affirming atmosphere that made Renaissance art possible.<sup>35</sup>

Although Thode's thesis is well known, and the influence of Franciscanism upon Italian civilization cannot be evaded, its specific influence upon the fine arts has not been satisfactorily demonstrated, either by Thode himself or by other scholars who have dealt with the subject.

That St. Francis did have a novel and extraordinary love for nature and its creatures is beyond question, as his legends amply prove. But whether this attitude could actually have influenced specific artists, or inspired specific naturalistic works, would be

almost impossible to prove. No scholar in recent years has applied himself to demonstrating, by citing actual examples of works commissioned for Franciscan churches, that such a connection resulted in more accurate representations of nature, or had induced the artists to include more plants and animals of landscape elements than the subject called for.

It is far easier to prove the Franciscan influence in the realm of literature, especially in poetry, than in the visual arts. The intensity of Franciscan piety created the form of the 'laude', characterized by deep religious feeling, mysticism, realism and simplicity, that could appeal to all men, the plain men as well as the educated.<sup>37</sup> Latin gave way to the language of the people, and the first hymn in the 'lingua volgare' was St. Francis' own Cantico dello Frate Sole. The laude of Jacopone da Todi, similarly inspired and expressed in the vernacular, followed the Cantico as the first great monuments of Italian literature.

It is also easier to suggest a relationship between Franciscanism and the new philosophy of Nominalism, than between Franciscanism and art. In the scholastic philosophy of the Middle Ages, the ruling school of thought was Realism. Nominalism replaced realism when Aristotle had replaced Plato as the philosophical authority. The Realists had acknowledged the reality of the generic notions, while the Nominalists believed in the reality of the specific notions, a philosophy that was more receptive to the affirmation of

the world. It was shortly after the appearance of St. Francis that the assimilation of Aristotelianism and Nominalism began.<sup>38</sup>

Franciscan thinkers especially were instrumental in advocating Nominalism. Alexander of Hales, a Franciscan friar, introduced Aristotle as an authority in the systematic exposition of Christian doctrine. Robert of Grosseteste, the founder of the Oxford Franciscan school, encouraged Roger Bacon, the English scholastic philosopher, to enter the Franciscan order. In particular, the Franciscan order fostered Nominalist thought, and it was to the Franciscan order that Nominalist philosophers were attracted. Franciscan thought, in embracing Nominalism, and in affirming the beauty of the world and the delight of corporeal vision, could perhaps be interpreted as having encouraged a philosophy that was receptive to a naturalistic art.

If any relationship can therefore be demonstrated between Franciscanism and naturalism in art, then this relationship appears to have been manifested indirectly through literature and philosophy rather than by the direct inspirational effect on the visual imagination of either artists or patrons.



## CHAPTER II

### ANIMALS AND PLANTS IN MANUSCRIPT ILLUSTRATION

In Italy, where Romanesque architecture and decoration persisted longer than in the northwest of Europe, the first traces of naturalism in the representation of plant and animal life appeared in manuscript illustration. Appropriately enough, the best and earliest example of accurately observed animal life occurs in a manuscript of southern origin, where the Arab and Moslem influences, so crucial to the revival of science in the twelfth and thirteenth centuries, were always strong. The manuscript in question is a copy of the remarkable De Arte Venandi cum Avibus by Frederick the Second. This manuscript (Palatino Latino 1071), now in the Vatican in Rome, represents a rare instance where the quality and significance of the visual material equals the originality and importance of the text illustrated.

The manuscript, of parchment, has 111 folios, 360 x 250 mm., and is inscribed in Italian Gothic, in two columns.<sup>1</sup> About two thirds of the total number of pages are illustrated, so that the marginal illustrations, nearly all in color, add up to approximately 900 representations of birds, animals, falconers, perches, and other falconry equipment.<sup>2</sup> The first folio is badly damaged, which makes it difficult to read the dedication but it has been deciphered as a

dedication to Manfred, the son of Frederick II.<sup>3</sup> If the reading is correct, then the manuscript must date from after 1250 and possibly not later than 1265 or 1266<sup>4</sup> when King Manfred died. This codex is already a revised edition, and it is still a matter of dispute whether the book originally had any illustration other than Frederick's portrait.<sup>5</sup> In any case, by Manfred's time, at the latest, the painstaking literary descriptions of the Emperor-author had been translated into visual language. Frederick's empirical approach to nature bore fruit in the sphere of artistic representation and generated a kind of pictorial naturalism. It is not yet a fully naturalistic style, since the painter is limited by a two-dimensional method of representation, and he resorts to nature observation almost exclusively where his special ornithological interest is involved.<sup>6</sup> However, the illustrations are imbued with the spirit of an almost scientific nature observation that is not to be found for another century.

The immediate problem in discussing this document is the need for selectivity, since the illustrations are abundant and, in spite of their charm, often repetitive. One has the feeling that the illustrator was carried away both by his passion for birds and his decorative urge, as well as by the desire to repeatedly demonstrate his skill.

Some general comments may be made before discussing individual pages in detail. As has been mentioned above, the method of representation is two dimensional--the birds are clearly outlined against the unspecified background of the blank page (the exceptions will be discussed later) with the ground lines generally indicated, are drawn in

profile, and are by far the best observed subjects, showing a wide variety of types, with perhaps a preponderance of aquatic birds in addition to falcons. Other animal life, figures, buildings, rocks, water, plants and vegetation are represented largely by schematic formulas that are no different from any other contemporary painting. For example, on the verso of folio one, the two illustrations (they can hardly be called portraits) of a king, presumably Frederick, seated on a throne, dictating (or so it seems from the gesture of the hands) and accompanied by a falcon on a low perch, while two falconers with birds are kneeling before him, appear more romanesque in character than, for example, a similar seated figure of the young King Louis IX in a French manuscript<sup>7</sup> of some thirty-odd years earlier.<sup>8</sup>

The other animals besides birds that occur are not as well observed, but are still superior to most of the human figures and the attempts at landscape, or rather, landscape elements like lakes, rivers and trees. The illustration is truly superior as an exposition of the text, since equipment like falcons' hoods, shears, perches and nooses are rendered in detail, in order to make the treatise useful as a textbook. In one instance, there is even a sequence of three drawings, showing a falconer tying a bird's lead to a perch. On closer observation, what seems like three identical representations turns out to be a "how to do it" diagram, with the knot appearing in various stages of completion.<sup>9</sup>

It is, however, in the naturalistic rendering of dozens of varieties of birds that this manuscript particularly excels. Falcons, gerfalcons, vultures, hawks, owls and horned owls, swallows, storks, pelicans, cranes, ducks, geese, swans, peacocks, and pheasants are only a few of the birds that can be recognized even by a layman. The ornithologist undoubtedly could identify many more of the lesser birds that are also included. Throughout, the birds are given their individual characteristics of feathers, bills, feet, crests and wings, and even the rendering of appropriate movements is sometimes successful. The series of flying ducks, geese, and particularly the storks on folio 16 are a graceful attempt at the rendering of an elusive movement. The rendering of birds walking on land, for example on folios 4 verso and 22, is less accomplished, since the artist could not place their feet on the ground convincingly, or else would not in order to more clearly demonstrate the characteristics of the feet. He has problems especially when attempting to show a vulture standing on a slope, as on folio 22. Not surprisingly, the birds which one suspects were more familiar to the artist and more accessible for observation while alive are more naturalistic. The stance of the falcon sitting on its perch, repeated innumerable times (e.g. folios 53-57), is always well done, even considering that the closed form of the bird of prey at rest presents few real difficulties. The unmistakable emphasis throughout is on

accuracy of representation, and the object is to identify the birds in question. Indeed, on many pages the birds are actually identified by name, although this might be by a later hand, and is clearly unnecessary. (e.g. folio 42v, 39, 41, etc.)

With this purpose in mind, the correct size of various birds is sacrificed in favour of ease of recognition, along with the size of birds relative to other objects. Folio 15, for example, shows a falcon resting on a boat, (large enough for a single mast and two crew members), nearly as large as the crossbar of the mast. Similarly, birds in trees (folio 51) and birds' nests on mountains (folio 49v), as well as people and buildings (folio 61v) are completely out of proportion. None of this is of course out of the ordinary--what is rather remarkable is that the artist was able to depart from convention in favour of naturalism as much as he did. On other points, too, the artist follows medieval practice. Birds on a lake are shown in profile, but the lake itself, a schematized series of concentric scallops is shown from above, while the flowers growing on the shores are again in profile, and even upside down at the closer shore, (folio 42v, 69). Elsewhere, flowers are dispersed decoratively to fill a blank space created between rows of birds (folio 45v).

Other animals, a goat (folio 35v), two greyhounds attacking a stag (folio 11), and a doe and a deer (folio 49) are also encountered. Of these, the latter two are naturalistic, even to the point of suggesting the characteristic timidity of the

animals, though lacking in native grace, while the goat is quite schematized into a calligraphic design and the lean hounds with their grasping fangs remind one most of all of lacertine ornament that is still found on Romanesque architecture of this period. Mention must also be made of the equestrian figures that appear toward the end of the codex (beginning with folio 81). These are quite well observed, both in relative proportion of horse and rider and in the movement of the animals, although the horses' heads appear a bit small. The riders actually appear to be sitting in the saddle, rather than standing astride the horses. Convention still persists in details such as the articulation of the muscles on the upper hind legs, which are presented by a series of half circles.

The naturalism of the animals in this treatise has a precedent in the mosaic of the Creation of Birds and Fishes in Monreale Cathedral, dating from circa 1180-90 (although the mosaic medium is hardly conducive to naturalistic representation), but there is no descendant till the second half of the fourteenth century in North Italy, where the cultural and political milieu of the despotic courts had certain similarities to the court of Frederick the Second more than a century earlier.

Just how the idea of assembling almost scientifically accurate nature studies into zoological picture books made its way from the south to the north is uncertain. Very little of the relevant material, such as Italian bestiaries, is accessible under present conditions.<sup>10</sup> But by the turn of the century, a considerable number of Lombard artists seem to have specialized in the portrayal of animals. There is evidence of this in the frequent use of animal motifs in manuscript fragments of sketch-books, which are invariably of Lombard origin.<sup>11</sup> At any rate, a greater number of Lombard drawings of the trecento and early quattroceto have survived than those of any other school. Perhaps the nature studies, especially animal portraits, were an obligatory part of the artists' training in this area.<sup>12</sup>

Probably the earliest North Italian example of such animal studies is the extraordinary manuscript known as the Cocharelli Treatise on the Virtues and Vices, now in the British Museum in London. It consists of three fragments, MSS Additional 27695 and 28841, containing fifteen and seven leaves respectively, and MS Egerton 3127 consisting of two leaves. The pages of plain vellum, about  $6\frac{1}{2}$  x 4 inches, are used on both sides. The illustrations are executed in clear line and tinted with colour and gold paint. The original book contained two Latin texts, and the scheme of decoration was different in each. The first text, to which belong MSS Additional 27695 and Egerton 3127, and the first leaf of Additional 28841, is a treatise on the vices,

written in prose by a member of the Cocharelli family of Genoa for his children. The tales with which he illustrated the theme he attributed to his grandfather, Pelegrino Cocharelli. The same authority is cited in the second text (in MS Add. 28841), a history in loose rhythmical verse of Sicily in the time of the Emperor Frederick II.<sup>13</sup>

The manuscript has been dated to the late fourteenth century<sup>14</sup> and may have been produced in Genoa or its neighbourhood.<sup>15</sup> Almost nothing is known of the Cybo d'Hyères to whom the illustrations are attributed. It is even unlikely that all the illustrations are by the same hand.<sup>16</sup> Possibly, the monk of Hyères was a member of the Cybo (or Cibo) family of Genoa, who flourished toward the end of the fourteenth century.<sup>17</sup> He may have been a monk of St. Honoratious, a monastery on the island of Lerino off the coast of Provence, and seems also to have lived on one of the neighbouring islands of Hyères.<sup>18</sup> The artistic connections of the painter, which would be of great interest, are unfortunately totally obscure. The more discriminating authorities such as Pächt even hesitate to class him with the Lombard school, preferring to settle for the less specific designation of 'north Italian'. Only one influence on the unknown painter is indisputable: he seems to have been acquainted with Oriental, possibly Arabic or Persian manuscripts from which he may have copied.<sup>19</sup>

Here we are chiefly concerned with the illustrations



in the fragments Additional 28841 and Egerton 3127. The prose treatise contains a series of full page paintings illustrating the text, and most of the text pages are themselves framed in purely decorative borders. These borders are inset with roundels containing miniature scenes with paintings of insects, birds, mammals, and grotesques. In the verse treatise the illustrations are all in the borders, which are not contained in formal frames. Miniature studies of animal life are also used as line fillers with a truly oriental sense of 'horror vacui,' in both the prose and verse texts. In the latter, sprays with leaves and fruit, and sometimes grass and water, stray between the lines across the whole width of the column.<sup>20</sup>

This manuscript so far stands completely isolated as an example of early Italian nature studies.<sup>21</sup>

The illustrations of the verse treatise, where the animals are not contained in formal borders, are perhaps the most interesting. This particular example of marginal illustrations, with the zoological specimens freely disposed over the page and among the lines of text, has been cited as a forerunner of the "strew-pattern" borders of Flemish illumination.<sup>22</sup> The variety of zoological specimens is astonishing. There are pages with representations of wild animals, a lion fighting with a bear or killing a doe (Add. 28841 f.1) or exotic beasts such as elephants, camels and giraffes. (Add. 28841 f.3) The animals are more remarkable

for their wide choice than for their naturalism, although even here the artist has realized life-impressions, although greatly simplified and schematized.<sup>23</sup> The artist's knowledge of exotic beasts need not have come from travel to the east, since all of these animals could have been found in the zoological parks that were kept for the amusement of the rulers of the despotic states. Frederick the Second (again we refer back to the south for parallels) travelled with an exotic menagerie, and already in the late fourteenth century the Visconti kept a zoo in their castle at Pavia.<sup>24</sup> A more remote possibility is that the artist copied the foreign animals from Oriental manuscripts, perhaps Arabic or Persian bestiaries.<sup>25</sup>

Far more interesting than the 'big game' for the study of the development of naturalism are pages in which the artist has used the representatives of the insect world and of marine life such as shells and crustaceans to decorate the margins of the text.<sup>26</sup> The caterpillars, bees, moths, and butterflies are recognizable and can even be identified as to genus, and are accurate enough to illustrate an entomologist's handbook.<sup>27</sup>

This type of accurate representation could only have been accomplished by a specialist who spent endless time observing nature's microcosm at first hand. The insects are fairly accurate even as to relative scale<sup>28</sup> with the smaller insects being lifesize or even smaller.<sup>29</sup> The

scientific spirit in which these illustrations were made is further demonstrated by the artist's tendency to put together on the same page animals that are traditionally allotted to the same group: land quadrupeds, marine invertebrates, insects and arachnids, with the latter being the most popular group. Also these marginal illustrations of the verse text are careful, impressionistic studies with no dramatic or expository content, as in the margins and miniatures of the prose text, thus reinforcing the scientific nature of the artist's interest.

In most cases, the insects such as butterflies are shown with wings spread out flat, as they would appear if the artist were studying them from pinned specimens in his own collection. Other types, such as the caterpillar, grasshopper, and dragon fly are shown in profile, which is the more characteristic impression of these insects. A similar practice is followed in the treatment of the shells and crustaceans, where the desire to use a shape appropriate for the space available is also evident, for example in the lobster on folio 5 in Additional MS 28841.

That the artist should have been more successful with the insect world than with the larger mammals is simply explained by the fact that he was a miniaturist. Obviously, there is less distortion or simplification necessary in drawing a bumble bee life-size than in reducing a lion to an inch long drawing. But there is also a further consideration. The micro-world of insects

(as well as marine life) has the still-life quality that makes close observation easy as well as possible. Objects which can be brought close to the eye in a purely physical sense, and which at the same time are unaffected by the symbolical associations of the larger animals that were also the subject of the bestiaries, were more likely to be observed with unprejudiced curiosity. The same artist was content to follow traditional formulas where the human figure was concerned.<sup>30</sup> In general, the human figure was the last of nature's creatures to be freed from the medieval ban on analytic observation.<sup>31</sup>

The development of descriptive naturalism in animal life is instructive, if one examines the bird studies that predominate in the prose text of this manuscript (Add. 27695 and 28841 f.1). In the observation of detail and species they are not much more sophisticated than Frederick's treatise, but in the depiction of movement and the characteristic posture while at rest, they are far superior. The various quail, owls, and cock that are found in the medallions of folio one are now correctly seen from profile, with the feet seemingly easily resting on the curved edges of the roundels, while the more dramatic scenes such as an eagle killing a stork are fiercer and more convincing than similar scenes in Frederick's treatise.

But it is a hawking scene (on folio 1 verso, Eg. 3127), the favourite pastime of the feudal world, that shows the distance travelled along the road to naturalism since the time of Frederick.

Again we are concerned with a folio that combines both text and illustration, but now the whole bottom half of the page has been used to create an illustration of landscape that provided an excuse for "composing a synoptical table of bird life" that "reveals a truly professional knowledge of the habits of birds and of the characteristics of their flight, matched by a great skill in depicting birds in their individual shapes and their typical movements."<sup>32</sup> For instance, the wing movements of various birds are differentiated, as well as the pattern and direction of their flight. Even the characteristic grouping of a number of birds of the same species flying together is observed, while in Frederick's treatise such groups are more likely to be flying one by one, in orderly rows.

By 1400, the Lombard school produced another specialist in animal studies, Giovannino de Grassi (or Giovanni dei Grassi), who worked for the Visconti<sup>33</sup> and was also listed among the engineers working on Milan cathedral.<sup>34</sup> Giovanni is first mentioned in 1389, and in 1391 in connection with the cathedral. Between 1392 and 1398 when he died, he was associated with several commissions: a gilded relief for the cathedral, a design for windows, the painting of sacristy sculpture, and the illumination of the transcript of Beroldo's Treatise on the Usage of Milan Cathedral (Biblioteca Trivulziana Cod. 2262).<sup>35</sup> The organic quality of the architectural decoration in this manuscript lends support to the attribution to Giovanni of a

sketchbook or 'tacuino' at Bergamo, which contains a number of interesting animal studies.<sup>36</sup>

The Bergamo Tacuino (Bergamo Biblioteca Comunale MS Δ VII. 14) consists of about sixty pages filled mostly with studies of animals.<sup>37</sup> This set of drawings can perhaps be called the first real zoological picture book, although there are still a few mythological creatures, such as the unicorn, that are retained from the medieval bestiary.<sup>38</sup> The nature of this volume of drawings needs explanation, since up to now we have been dealing with manuscripts whose primary purpose was the transmission of a text, and the illustrations were associated with the content or were a decorative adjunct to the written material. In the Bergamo Tacuino we encounter an example of the artist's sketchbooks which become more frequent in the fifteenth century. The animal drawings in this manuscript are not sketches in the modern sense, since they are not rough drafts of an experimental character, but are finished drawings to which nothing need be added. (Villard de Honnecourt's drawings mentioned earlier would more accurately qualify as 'sketches'.) A number of the animal motifs from Bergamo have been recognized in contemporary manuscript illuminations which are also considered to be by Grassi himself.<sup>39</sup> That is, the drawings in Bergamo are found in almost identical form in manuscript paintings which are certainly considered finished works. That the drawings are

nature studies is unquestionable,<sup>40</sup> since their sensitivity and attention to detail has no precedent. While the Cocharelli treatise relied on the characteristic shape and movement of the birds for likeness, the Bergamo drawings include interior modelling and such fine detail as feather markings and even convey a distinction between the texture of the feathers of various parts of a bird's anatomy (e.g. the vulture on folio 13 verso). The lack of spontaneity in some of the drawings has been cited<sup>41</sup> as proof that they are not true nature studies, but possibly workshop copies. Admittedly, the animals show little movement, indeed many are portrayed in an absolutely motionless state, and appear in many cases as though the "exhibits of a zoological museum and not living specimens had been the artist's models."<sup>42</sup> Indeed, all the carefully observed details of plumage would have been impossible if the artist had had a living model. What must be remembered is that naturalism first took the form of accurate observation of facts, and only after this had been mastered did it move on to the more difficult aim of seizing the definitive aspect of the animal alive. As Pacht has put it, "nature study in art did not start with making snapshots."<sup>43</sup> Previously (Eg. MS 3127 folio 1 verso, the hawking scene in the Cocharelli manuscript), when the characteristic movement of the animal or bird was realized even with relative success, the renderings were always so minute that there was no room

for contradictory detail. In fact, accurately observed detail is not compatible with the rendering of movement, which is almost always necessary to convey the sense of life that is naturalism at its ultimate. The chronological limits of this study do not permit the discussion of this type of naturalism, which is not achieved by any artist until Leonardo, and by very few even after him. Dürer's nature studies, for example, also suffer from this 'nature morte' character.<sup>44</sup> But one need not go so far afield. Flemish painting, and especially the work of Van Eyck, has the quality of being preserved under glass, a fragment of nature, flower, or insect, being captured in a crystal prism, with all its living detail and color intact, yet immovable and lifeless. Only in the pen of Leonardo does one get the detail compatible with minute observation and understanding of structure, as well as the innate vitality of the organism, and this perhaps is conveyed less by movement than by the magic of Leonardo's line.

The development of naturalism in plant studies is intimately connected with the illustration of herbals. Since antiquity, the study of plants had been approached from two standpoints--the philosophical and the utilitarian.<sup>45</sup> From the first point of view, botany is an integral branch of natural philosophy, while from the second, it is a by-product of medicine or agriculture. It is this latter practical point of view that is chiefly responsible for the existence of herbals,



which are not tracts on natural science, but handbooks of applied science or manuals on medicine.<sup>46</sup> From the beginning, the herbal was a kind of descriptive drug catalogue that listed the remedies to be extracted from vegetable substances. As a matter of course, these manuals had to be illustrated, since they would be useless to the herbalist or doctor unless the plants listed could be identified, a doubtful possibility from mere written description.

In general, the medieval herbals are derived from the antique prototypes dealing with the system of folk medicine developed in Greece. That herbals in antiquity reached a high degree of accuracy in the portrayal of plants is evident from the earliest surviving illustrated herbal, the Dioscorides Codex Anicia Juliana of circa 512 A.D., now in Vienna.<sup>47</sup>

The ancestry of this particular text should be of interest here, since its antiquity amply illustrates the continuity of tradition in the area of herbals that goes unbroken from the second century B.C. to the sixteenth and even beyond.

Dioscorides, who was born in Asia Minor probably in the first century of the Christian era, compiled the writings of an earlier physician, Cratevas, who served the king Mithridates in the second century B.C. Pliny noted that Cratevas produced a herbal with colored pictures of plants, and although this was lost, the compilations of Dioscorides,

titled De Materia Medica, culled from a number of writers, who in turn followed Cratevas, included the description of about five hundred plants. No contemporary version of the Dioscorides exists. The earliest version we have is the Vienna Codex, made for Anicia Juliana, the daughter of a sometime Emperor of the West.<sup>48</sup>

The text of this manuscript consists of an account of the names and healing properties of certain herbs. Descriptions are scanty, and only a few plants can be recognized with certainty. Yet until the Renaissance period, the text of De Materia Medica was accepted as almost infallible.

The illustrations, however, indicate the degree of perfection achieved in the rendering of plants in antiquity. These are not original observations, but were probably copied from earlier Hellenistic models.<sup>49</sup> Examining a few of the full page drawings, such as folio 315, (paintings would perhaps be more appropriate, since all the plant portraits are coloured), one can see that the treatment of the individual botanic specimens is highly naturalistic. The plants are drawn with care and attention to detail and are definitely recognizable. The only touch of formalism is probably due to the didactic purpose, which apparently required that a plant should be shown upright and in total, including the roots. Although the plant itself is laid out in a rigid format, the individual leaves are drawn from a

natural viewpoint instead of flattened out in diagrammatic fashion.

The naturalism of these plants is more remarkable if one remembers that the portrayal of individual human physiognomy was shortly to be completely submerged by byzantine convention. During the Dark Ages, the herbal illustrations, like everything else that was handed down from antiquity, underwent a transformation that rendered this type of illustrated manual practically useless. Comparison with an illustrated herbal of the late eleventh or early twelfth century is sufficient to show the extent to which naturalism had been transformed. A page from a Latin herbal of Apuleius Plato, now in the Bodleian Library at Oxford<sup>50</sup>, purporting to illustrate a sword lily, couch grass and rosemary (one has to take the word of the editor for this) demonstrates the difficulty that the medieval herbalist must have had in trying to use the manuscript as a source of information. In the process of handing down the prototypes from copy to copy, the medieval illuminator, not being even an amateur herbalist, soon lost the meaning of the original forms, so that the picture became totally unreliable.<sup>51</sup>

The twelfth century revival of science also resurrected the herbal as a practical manual. Such developments as the establishment of the medical school at Salerno helped create a need for new texts. Soon the old and new

knowledge about herbs was collected into an alphabetical arrangement and became widely circulated as the Compendium Salernitanum. At first, the text was probably not illustrated, but by the early fourteenth century this omission was rectified, and the Compendium Salernitanum became a prototype for a whole series of illustrated herbals.

Fortunately, there exists an early example of this Latin text that is of Italian origin and dates from the early fourteenth century. On stylistic grounds, this manuscript (Egerton 747) has been given a south or central Italian provenance, and it is considered possible that it may even be a direct descendant of the original pictorial cycle that accompanied the text.<sup>52</sup> Compared to the crude schematization of the twelfth century, the Egerton manuscript represents a great improvement in the illustrator's ability to record his observations. The plants are still drawn in either frontal or profile views, and arranged either decoratively (folio 104v) as the convolvulus, or symmetrically and diagrammatically as the pine, but they now contain enough individualistic detail to render identification possible. Their failure as plant portrayals are not due to lack of distinctive detail, but to a woodenness and rigidity that denies the organic qualities of plant life. Such an illustration as the pine is correct as to detail, with pine cones and needles recognizably rendered, but conveys a totally erroneous concept of the whole,

which resembles a plant rather than a tree. Like the Anicia Juliana codex illustrations, these plants are usually depicted not as a growing organism, but as a specimen plucked out by the roots and prepared for observation and study.

The reasons for the more naturalistic representation of plants at this time are the same as for animal life--the new critical and searching spirit of the time. The same compulsion for empirical knowledge that was manifested by scholars like Albertus Magnus and even Frederick the Second must also have inspired the herbal illustrators to consult nature to verify or correct the pictures in the texts to be copied. But it is possible that they also resorted to copying from older, late classical sources, perhaps like the Vienna Codex, which had far more naturalistic illustrations than the more recent works. Such examples were still to be found in libraries in southern Italy, for instance at Monte Cassino.<sup>53</sup> Perhaps oriental herbals were also available in the south for copying, although the one example of an Arabic manuscript that has been available here for comparison does not encourage the idea that this was a source for the naturalistic impulse. An illustrated page from an Arabic translation of the Dioscorides, dated from the early fourteenth century<sup>54</sup> does not seem to be as well observed as a comparable page of the Egerton MS of approximately the same date, and of course its stylistic peculiarities and ornamental qualities are of an essentially different character.

To follow the progress of naturalism in plant studies, one again has to move from south to north, this time to Padua and Venice instead of Genoa and Milan as was the case in the field of animal studies.

A herbal in the British Museum (Egerton MS 2020) has the distinction of being the finest and most naturalistic herbal so far discovered. This herbal is an Italian translation of an Arabic text (Serapion the Younger) and was written and illuminated for Francesco Carrara the Younger, last lord of Padua, as the frontispiece with his coat of arms testifies. Since Francesco's reign came to an end in 1403, the herbal must have been executed prior to that date.<sup>55</sup> Unfortunately, the Paduan artist whose work this is remains anonymous, but his talent for the naturalistic portrayal of plants is at least on a par with Giovanni de Grassi's skill at the portrayal of animals.

It is not certain that the Carrara herbal was the first naturalistic herbal produced, but in the absence of earlier models one has to grant it the honour. At any rate, the anonymous Paduan artist brought a novel treatment to the ancient practice of herbal illustration: instead of showing the plants as exhibits pulled up by roots, he shows a living plant, or more often, a part of a living plant such as a spray of flowers or a bunch of grapes on a vine. This signifies a fundamental change in the purpose of herbal illustration from the functional to the aesthetic consideration.<sup>56</sup>

The didactic and functional character of all previous herbals was expressed by showing the total plant--including the roots below the ground as well as the upper growth, and often including the fruit along with the flower.

For the first time in herbal illustration, the Carrara paintings qualify as works of art and not merely as expository diagrams. The artist prefers the empirical truth of nature, a casual glance rather than the abstraction of a complete plant that is no longer a flourishing organism.<sup>57</sup>

The painting of the convolvulus no longer conforms to the abstract decorative curves that earlier illustrators found appropriate for a climbing vine. The curves of the stem are no longer regular, but have, as it were, an organic life of their own that determines their movement across the page, even conveying a sense of space and depth. The natural irregularities of the plant are lovingly detailed--the full-grown leaf and the immature tendril, the flower in bloom and the unopened bud are all there, yet without the didactic spirit of the earlier herbals. Now it is the text that accommodates itself to the space instead of the plant filling in the margins and gaps left by the text. Detail such as the indentations and veins of the grape leaf, and the intricate corkscrew growth of a tendril are included, yet the total effect manages to be illusionistic, largely on account of the informal arrangement and composition of the plants relative to the page.

The novelty of the Carrara herbal is obvious if it is compared to a nearly contemporary manuscript, the Lombard Historia Plantarum (Rome Casanatense MS 459 folio 125). Here the plant is shown in the traditional way, pulled up by the roots and spread out to form a symmetrical arrangement of regular-lobed leaves and a pair of flower stalks curving together in an abstract heraldic pattern, with the total effect being decorative and formal rather than naturalistic.

This new conception of the herbal was successful enough to be imitated with much enthusiasm. A herbal compiled in 1419 in Venice by Benedetto Rinio, a doctor of the university of Padua, was illustrated by an otherwise unknown painter, Andrea Amadio.<sup>58</sup> At first glance, the illustrations seem equally to have been observed first hand from nature, but a detailed comparison with the Carrara herbal reveals that Amadio not only did not do life studies, but actually made almost exact copies of a number of the plants in the older manuscript.<sup>59</sup> In the process of copying, he abstracted and simplified the little irregularities found in nature that were faithfully transmitted by the anonymous artist of the Carrara herbal.

While the angular branches of the grape in the Carrara herbal are realistic, the same branch in the Rinio Herbal has had the angles removed and manages to resemble a piece of rubber hose. Similar transformations in favour



of decorative abstraction (not always successful) are visible in the paintings of the popular convulvulus.

The achievements of the Italian trecento in descriptive naturalism were, however, not exploited further by the majority of Italian artists of the next century, with the exception of the International School and Pisanello. The representation of the variety of plant and animal life, no matter how far advanced in naturalistic portrayal, was of little interest and importance to the Florentines, whose major artists dominated the quattrocento and whose interests were almost solely concerned with the discovery of perspective and the development of the monumental style and its chief subject, the human figure.

### CHAPTER III

#### CONTRIBUTIONS OF THIS ASPECT OF NATURALISM

The specific contributions of the naturalistic portrayal of plants and animals in Italian manuscript illustration therefore falls outside the mainstream of Italian painting, and is concerned chiefly with the North Italian and the International Gothic styles.

One aspect of this contribution was a development towards landscape, and in that context a development towards a more total treatment of space rather than the depiction of single, isolated landscape elements. Another aspect was an improvement in the descriptive rendering of natural objects, both in terms of their observation and knowledge about them.

Man's interest in nature was first focused on individual natural objects. Eventually, these objects were increasingly pictured in their natural settings--in actual fact, in rudimentary and halting attempts at landscape. The transition from the observation and recording of individual natural objects to the perception of landscape as a whole can best be traced from nature studies of plants, through the herbals to the Secreta Salernitana and Tacuinum Sanitatis type manuscripts, which first expanded the plant portraiture of the simple herbal into 'genre within a landscape' scenes. Related to this type of manuscript also are the early calendar illustrations which developed from the four seasons, and

related illustrations of the Tacuinum Sanitatis type manuscript into fullfledged landscapes for each of the twelve months of the year.

The herbal illustrations described in the previous chapter are merely simple, diagrammatic and didactic plant portraits, and are but seldom interrupted by the introduction of short scenes, usually related to the history and utility of the plant in a loose narrative form. Sometimes in herbals of Arabic origin, the plant illustrations developed into 'genre' scenes of herbalists gathering the plant or apothecaries preparing medicines.<sup>1</sup> In these examples, the plants appeared as part of a scene even where there was no accompanying story of discovery.

It was this idea of illustrating the herbal with the plant shown in a characteristic setting that was a crucial step from herbal to landscape. This step was taken most successfully in the Italian Tacuinum Sanitatis type manuscripts dating from circa 1400.

These Tacuinum Sanitatis manuscripts really represent a cross between the alphabetically arranged herbal compilations of the Secreta Salernitana type which sometimes contain figured scenes relating to the plant being illustrated, and the ordinary herbals of the Dioscorides type, which merely show the isolated

plant for identification purposes. Basically, the Tacuinum Sanitatis manuscripts were picture books illustrating the Latin translation of an Arabic treatise on hygiene by Albulkasem, a Christian physician of Baghdad living in the eleventh century.<sup>2</sup>

Both Pächt and Berti-Toesca have singled out a Hispano-Provençal manuscript in the Biblioteca Nazionale in Florence (Cod. Pal. 586) as a transitional herbal of the Secreta Salernitana type that contains numerous plant illustrations enriched by anecdotal horticultural scenes including human figures.

The previously mentioned Codex Casanatense 459, entitled Historia Plantarum, is also in reality a close associate, if not a forerunner, of the Tacuinum Sanitatis manuscripts. In fact, it is a sort of encyclopedia of natural history, dealing in alphabetical order with plants, animals and minerals with medicinal properties, and therefore represents an amplification of the Secreta Salernitana treatises, which dealt only with plants. This manuscript apparently incorporates two novel pictorial inventions--the chapters dealing with animals are illustrated by designs based on nature studies, and second, the Tacuinum Sanitatis idea of presenting the plant or animal as part of its natural setting is also incorporated.

This type of illustration, i.e., the plant in its natural setting, developed as a new departure in herbal illustrations, was eventually reintroduced into the older, and alphabetically arranged version of manuals of hygiene, the Tacuinum Sanitatis, which apparently developed into a popular and luxurious medical book for laymen.

This Tacuinum Sanitatis group consists of three manuscripts: Paris B.N. Nouv.Acq. lat. 1673; Vienna, N.B. ser.nov. 2644; and Rome, Casanatense, MS r182. The oldest of these is the Paris Codex, which Pächt believes was illuminated by Lombard artists, contemporaries of Giovannino de' Grassi, in circa 1380-90. The Vienna manuscript was painted for a member of the Cerutti family before 1403, while the manuscript in Rome also dates from circa 1400.<sup>3</sup>

In the Paris Codex every plant is already incorporated in a landscape setting, but only occasionally, as in the miniature showing grain being harvested and tied into bundles,<sup>4</sup> is the plant in question fully integrated with its setting. However, in another miniature<sup>5</sup>, the plant stands isolated and out of proportion, against a backdrop of unrelated vegetation, heraldically flanked by two figures, didactically pointing to the object of the illustration. Such illustrations were not entirely new--in Codex Pa. 586, a herbal compilation (wrongly identified by E. Berti-Toesca as a Tacuinum Sanitatis, according to Pächt<sup>6</sup>) similar scenes occur, but in the Paris Codex, a new

dimension--a narrow strip of landscape and the illusion of space has been added.

The most successful landscapes are those that illustrate grains or rice, plants that are more commonly thought of in the mass rather than as individual plants. For the artist the problem of composing a number of plant units does not exist, and therefore the landscape is not a conglomeration of individual objects but rather an integrated whole in which the human figures, the peasants labouring in the countryside, belong to the surroundings. Because the scene as a totality is studied from nature rather than constructed, it approaches a degree of individualization that is uncommon even within the same manuscript as well as for the period.

The later Vienna Tacuinum<sup>7</sup> already makes extensive use of the more progressive type of landscape illustration. The scenes are more distinctly like landscapes and genre scenes, they are viewed from a greater distance, and the individual plants are less prominent, not being isolated against contrasting vegetation. The proportions of the plants relative to the human figures have become more realistic, and the figures no longer point to the plant being illustrated, but go about their daily tasks, tending the plants, gathering the fruits in their natural milieu, which, instead of the individual plant, has become the primary object of the miniature. The figures, too, are more absorbed into the

setting, so that the miniatures are both landscape and genre scenes rolled into one.

The most remarkable innovation of the Tacuinum is, however, the fact that in a number of the miniatures the subject is not a plant, or mineral, or animal, nor even a particular occupation, but rather a specific condition of nature, like the four seasons, or some phenomenon of weather associated with them like a storm or a rainfall. This is completely new subject matter--the setting itself becomes the subject, and what was previously the *raison d'être* of the setting, the human figures performing some characteristic labour or play, becomes a mere accessory. As Pächt points out, the portrayal of the four seasons had, in Ambrogio Lorenzetti's frescoes, still been achieved by means of allegorical figures.<sup>8</sup>

On the recto of folio 57 of the Vienna Tacuinum is a miniature entitled "Ventus orientalis", a scene in which the weather can be said to be the principal subject matter. A woman is shown hurrying toward a castle door, covering her head with her mantle, a child hanging on to her windblown skirts. On the right, three trees on an abruptly rising hill are bending in the stormy wind. Above, against a plain parchment background, a cloud is depositing its bounty upon the land. It is a summer storm with wind and rain, to my knowledge the first one in painting, unless the earlier Paris Tacuinum also contains such scenes.

On the verso of the same folio 57, there is still another unusual phenomenon depicted in a scene illustrating the "Ventus occidentalis." Two hunters in eastern dress (the only miniature in the manuscript that shows this peculiarity) with pointed caps, and equipped with bows and arrows, are walking against the wind, their long hair and beards billowing out behind them. Hills frame the landscape on each side, while above, beyond the plain parchment background, there is painted an odd, triangular strip of blue sky with flamelike streaks and a bright orange sun setting behind the hill at left. It is the only instance of the illustration of the sun in the manuscript, perhaps one of the first such illustrations in all manuscript illumination.

Elsewhere, the Vienna Tacuinum has country scenes of fishing and hunting, of fields of grain being reaped, that manage to convey the verdant mood of streams and lush vegetation, or summer heat and somnolence, that are unexpectedly evocative for such small, detailed illustrations. This manuscript then is almost a competitor of the later calendar of the Très Riches Heures, and makes up in abundance and spontaneity what it lacks of the Limbourgs' perfection and refinement. There is even a miniature devoted to that phenomenon of life neglected by medieval art--snow--but its rendering as small white patches on a decorative, still byzantine and most unlikely looking hill is so meagre that it can hardly qualify as a snowscape.



The Tacuinum Sanitatis manuscripts generally have illustrations of the four seasons of the year. These were derived from the 'labours of the months' type of subjects that were so popular in the middle ages that they were often carved in quatrefoils on the cathedral portals. In these, and also in the Italian trecento calendar illustrations, the emphasis was on the human activity and not its setting. The novelty of the Tacuinum seasons' illustrations is that the setting becomes more important than the human figures and their work.

Shortly after the appearance of the Tacuinum seasons landscapes, the first comprehensive cycle of calendar landscapes in Italy was painted, not in a manuscript, but as a fresco decoration in a tower room of the bishop's residence in the Torre Aquila. This splendid fresco cycle, on a monumental scale, has been called by Morassi the richest and most complete of medieval "pittura cavalleresca".<sup>9</sup> The author of this cycle is unknown, but it is believed that it was painted between 1390 and 1419, during the bishopric of George of Liechtenstein. However, the outer limit of these dates can be further reduced to 1407, the year when the bishop had to flee from Trento, because on one of the frescoes a contemporary legend refers to the entry of Frederick of Austria in Trento, proving that the frescoes must already have been there at that date.<sup>10</sup>

The attribution of the frescoes is not as easily solved. They have been considered Italian, German, and even French, or a combination of all three by a number of scholars.<sup>11</sup> Morassi himself has tried to analyze the iconographic and stylistic peculiarities of the frescoes, noting that the architecture, the vegetation, and even the monthly activities of the peasants in the field, point to a northern origin for the artist. Morassi points to such clues as the late flowering of the meadows, the later maturing of the grain, and the fact that most of the figures are blond and dressed in the northern style. The decorative details such as the medallions around the windows belong to the Lombard-Veronese style of the late trecento. Stefano da Zevio is considered and then rejected as the artist, and Morassi himself leans toward Weingartner's view that the artist who painted the Torre Aquila cycle was the same artist who produced the frescoes representing the epiphany in a church of Bressanone, the frescoes in a chapel in Riffiano, and also in a campanile in Merano.<sup>12</sup> Most recently, G. Inama has suggested that the identity of the artist is master Wenceslas, painter of Trento, who is mentioned in the records of the confraternity of San Cristoforo in Arlberg, and who probably served the bishop George of Liéchtenstein, during whose reign the Torre Aquila was decorated with frescoes.<sup>13</sup>

Whatever the actual identity of the artist may be,

stylistically the frescoes confirm his international gothic predilections. Incongruous as it may seem, this monumental fresco cycle in every respect follows the conventions of the calendar cycles in French books of hours, and in certain particulars it has a close resemblance to the famous calendar illustrations in the Très Riches Heures by the Limbourg brothers. A detailed examination of the individual scenes reproduced by Morassi bears this out. To begin with, the general aspect of the scenes, their wealth of detail that amounts almost to busyness, suggests the training of the miniaturist and illuminator. The arrangement of the figures, with the principal actors in the foreground, usually the gentry pursuing their pleasures, and the smaller figures of the peasants toiling at a variety of tasks in the background, suggests the artist's preoccupation with juxtaposing the social classes, a convention that was pointed out as a major characteristic of the international style by Panofsky.<sup>14</sup>

The size of the background figures does not, however, diminish to the same extent as, for example, in the Très Riches Heures, but here the unknown artist may have been trying to compensate for the requirements of viewing a large scale fresco whose upper parts are some distance above eye-level.<sup>15</sup> In many of the months the figures are distributed on a 'winding paths' pattern, pointing to the early quattrocento compositions of the Adoration of the Magi, with the colorful retinue of the

kings winding in zig-zag fashion into the background. Such are the scenes of April, October and November, and even the compositions for June and July give this impression at first glance.

The major difference between the Torre Aquila frescoes and the Très Riches Heures occurs in certain of the landscape elements, most notably in the hills that fill the upper part of the picture. In the Très Riches Heures, these are naturalistic, rounded and gently rolling, while in the Torre Aquila frescoes they are still steeply ragged and byzantine in appearance.<sup>16</sup> There is, however, little difference between the Torre Aquila frescoes and the Très Riches Heures as far as the relative proportion of the architecture to the human figures is concerned, nor is this to be expected until well into the fifteenth century.<sup>17</sup> In each case, the figures and the architecture are not drawn to the same scale, with the figures being large in comparison to the buildings. In the case of the vegetation, a close-up of the May scene in the Torre Aquila reveals the artist's reliance on the decorative pattern of Gothic tapestries<sup>18</sup>. Such flower strewn meadows are also characteristic of the Tacuinum Sanitatis illustrations, (probably derived from the same source), for example Figure 179, p. 293 in Morassi, where an illustration is reproduced from the Casanatense manuscript in Rome, showing ladies sitting in a field picking flowers.

The relation to the Tacuinum Sanitatis type illustrations is not altogether surprising, since George of Liechtenstein, the patron of the Torre Aquila artist, was the second owner of the Vienna Tacuinum Sanitatis. Most likely, then, the artist (and one has to suppose his Lombard origin or training) had access to the bishop's manuscript and used it as a model for his calendar cycle. This Vienna manuscript is of Lombard origin, which could account for the northern, and even decidedly International Style tendencies of the Torre Aquila frescoes.

The more obvious difference between the two calendar cycles is the fact that in the Torre Aquila cycle the human activity assumes a more important role in each scene as a whole. Yet, insofar as the development of landscape as a subject for painting is concerned, the Torre Aquila frescoes are the most advanced since the countryside of Ambrogio Lorenzetti in the Palazzo Pubblico in Siena. The observation of the diverse aspect of the landscape throughout the year is remarkable, and in one instance perhaps even unique. In the January illustration, a group of lords and ladies are disporting themselves outside the castle gates, while two peasants accompanied by dogs are hunting rabbits--but remarkably enough, this quite standard scene takes place in a snowy landscape and the lords and ladies are actually having a snowball fight. If one can accept the dating of this cycle as prior to 1407,

then surely this is the first genuine snow landscape in painting, and the February miniature of the Très Riches Heures has to relinquish its claim to this distinction.<sup>19</sup> To be sure, the fresco artist has not been as successful in the rendering of this natural phenomenon as the Limbourgs--in the Torre Aquila, the snow covers the ground, but there are no traces of it on the castle roof, or on the trees, most of which still appear to have their foliage intact, although the snow is deep enough for the peasants to sink in it above the ankles.<sup>20</sup> It is worth remarking, however, that the gentry appear not to be inconvenienced by the depth of the snow since their feet are in full view. A detail of the hunter with the rabbit also confirms that the commoners are treated in a more naturalistic way--he is bundled up in a hood and mittens against the cold, while the ladies tossing snowballs are sporting unseasonal décolletage.

The contribution of manuscript illustration to the development of landscape is easy to describe, but it is rather more difficult to assess its total impact on the development of the genre as a whole, since simultaneously with the advances in manuscript illustration, apparently unrelated developments (with the exception noted above) towards the mastery of total space were also occurring in the media of panel and fresco paintings.

It was Sienese taste that was always more favourably predisposed to the idea of landscape than the Florentine. Duccio's

Maesta, completed between 1308 and 1311, includes several scenes with landscape settings, among them the Agony in the Garden, that displays a remarkably poetic sensibility towards nature, as well as a feeling for space. In contrast, Giotto's compositions were always far more concerned with the human drama than with its setting, the latter being merely an adjunct to the former.

Simone Martini's Guidoriccio (1328), although spatially primitive, yet expresses a no lesser lyric sensitivity towards the countryside, while somewhat later, Ambrogio Lorenzetti's Good Government in the Country fresco marks a milestone in the spatial rendering of panoramic views.

However, it would be difficult to establish a relationship between Ambrogio's unique and seemingly unprecedented achievement and the more gradual and less spectacular progress made by the manuscript illustrators, since the concept of the panoramic landscape was not followed up. The spiritual devastation following the Black Death in and after 1348 appeared to precipitate a withdrawal from the world, manifested in art by a return to concerns of an abstract and transcendental quality.

The more limited medium of manuscript illustration does not seem to have been affected to the same extent, and when naturalistic concerns again reappeared in painting at the turn of the fifteenth century in North Italy, they occurred in manuscript illustration rather than in panel painting or fresco.

At the same time that a more total treatment of space developed from the interest in rendering individual natural objects, the accuracy of both observation and rendering improved considerably. The improvement appeared not only in the recording of what was observed, but also in the increase of knowledge about the plants and animals that were subject to observation.

The improvement becomes evident if one compares the earliest example of naturalistic plant portrayal discussed here, i.e., the illustrations in De Arte Venandi, with the drawings of Giovanni de Grassi and Pisanello. That progress should have been made in the degree of naturalism achieved is not of course surprising, since the art of painting and drawing developed over the course of approximately one hundred and fifty years. It is remarkable, however, that the nature of the interest that prompted observation in the time of Frederick II was still the same in the time of de Grassi and Pisanello. That is, the primary object of the artist was still the accuracy of representation in itself. Stylistic features are of course another consideration, but in essence the anonymous illustrator of the falconry treatise was concerned with the transmission of knowledge about the subjects of his art, as were de Grassi and Pisanello. This is especially true if one considers for comparison the finished manuscript illustration of the earlier period, and only the drawings in the sketchbooks of the artists of the early quattrocento.



Although in many cases these sketchbooks contain what we would consider to be finished studies, they differ from the earlier manuscript in that they were not intended to be used as drawings, but were made for later use as models for paintings. Thus they too are concerned with the transmission of accurate visual data.

Taking first for comparison a greyhound from folio 12 recto of the falconry treatise, and one from the sketchbook of Giovanni de Grassi,<sup>21</sup> it is obvious that in the case of this animal both artists considered the profile view to be the most characteristic. Indeed, throughout the manuscript, the animals are generally shown in profile, with a few exceptions in the case of birds, where occasionally a profile body will have a head turned frontally. The differences in treatment occur chiefly in the interior modelling. In De Arte Venandi, the hounds have a profile silhouette, with only one or two lines near the belly within the outline to suggest three dimensionality, and a few spots across the back to give an idea of the texture of the coat. In de Grssi's drawing, the muscles of neck and shoulders are modelled, as well as the sinews of the legs, and even the claws on the paws have been observed. Also the body now has more substance, not only because of the modelling, but also because the form itself is less attenuated and conforms less to a preconceived idea of the animal. No doubt the thirteenth century illustrator was accurate enough to describe the animal sufficiently for identification, but the stylistic means available to him limited the amount and kind of information that

he could convey. If one compares the falcons in the manuscript with a falcon drawn by Pisanello,<sup>22</sup> similar conclusions can be drawn. The manuscript falcon, on folio 1 verso, is shown from the back, resting on the falconer's hand. However, the artist apparently did not feel that a rear view was sufficiently informative, since the falcon's head is shown in profile to redress the inadequacy of the rear view. Pisanello's hooded falcon, on the other hand, is shown completely from the back, as it perches on a gloved hand, and yet no information is lost from the lack of a profile of the head. The manuscript illustrator had shown a compact silhouette--Pisanello's is compact also, but it allows for greater detail, such as the hunching of the wings at the shoulders, and the overlapping of one wingtip over the other to break the smooth outline. The earlier artist had drawn in the scalloped pattern formed by the feathers, but Pisanello has gone even further, and has indicated by fine hatching the textures as well as the pattern of the feathers. Even the fine and coarse feathers are differentiated by a difference in the firmness of the hatched lines. It could of course be argued in both the examples cited above that the difference in scale accounts for the difference in the amount of detail shown. However, the very fact that in the thirteenth century it was only in miniatures that this type of illustration was found indicates that the amount of information conveyed in this form was considered sufficient. By the early

fifteenth century, however, demands on the artist for greater  
versimilitude to nature apparently were far more stringent, and  
the artists' technical ability had developed to satisfy this  
demand of taste.

### CONCLUSION

The naturalistic description of plants and animals that has here been examined was never, during the two centuries under study, a major concern of Italian art, but it represented an important minor interest that eventually surfaced in the first half of the fifteenth century, during the heyday of the International Gothic Style.

This style, first so named by Louis Courajod, came late under scrutiny, and it was only in the latter part of the nineteenth century that its florescence began to be studied for its own sake rather than as a foil for the antithetic developments of the Renaissance.<sup>1</sup>

This International Gothic Style, so-called not because it was widespread, but because it incorporated diverse national tendencies, was formulated in France, Paris, and Burgundy about the year 1400. In Italy, it flourished in the first half of the fifteenth century and was still practised by artists like Benozzo Gozzoli as late as the 1450's, but it was always localized, being largely native to the North of Italy, and no really major painter, with the exception of Pisanello, is associated with it.

The style developed from a fusion of three national tendencies: the Gallic as represented by the French, the Latin as represented by the Italians, and the Anglo-Germanic as represented by the Flemings. It then spread throughout Europe--to Germany,

Austria, Spain, England, Flanders, and even back to Italy by way of multilateral repatriation.<sup>2</sup>

The style as a whole incorporates a number of contradictory characteristics: manneristic tendencies were manifested by an emphasis on calligraphic lines, an excessive refinement of proportions, a love of variegated color including gold and silver, and a preoccupation with pattern; and a detailed naturalistic tendency is also evident in the realistic portraits, recognizable landscapes, retinues with accurately observed animals, and the rendering of seldom recorded phenomena like night scenes and snowscapes.

This latter aspect, the naturalistic one, has been attributed by Panofsky to the Flemish part of the trio of nationalities contributing to the style. Nevertheless, the possibility exists that the naturalistic vein in Lombard manuscript illustrations of the Tacuinum Sanitatis type were a contributing influence in the formulation of this aspect of the style. While direct proof of this is not demonstrable, it is possible to prove that the Franco-Flemish masterpiece of the International Gothic Style, the calendar of the Très Riches Heures of the Duc de Berry (1416), contains naturalistic elements for which precedents can be found in Italian, and specifically Lombard, manuscript illustration. For example, the labours of the months in the calendar illustrations are no longer given the greatest emphasis, since the landscapes are given equal, if not greater, importance. As the previous chapter has shown, this development was already documented in the Lombard calendar miniatures

of the preceding decade. Another of the Limbourgs' apparent innovations is that the calendar landscape takes up the whole page-- again, the Lombard Tacuinum Sanitatis scenes discussed earlier were conceived as full page miniatures incorporating landscapes. Even the seasonal modifications of the landscape in the Très Riches Heures are nothing new, since in the Vienna Tacuinum one can see some rudimentary attempts at picturing snow, and some more successful attempts at describing storms, sunsets, and other phenomena of weather. Even a specific example of borrowing is not lacking, since the boar hunt of the December miniature of the calendar must have been taken from the sketchbook of the North Italian miniaturist and manuscript illustrator Giovanni de Grassi,<sup>3</sup> who in turn probably copied this scene from a Roman hunting sarcophagus.<sup>4</sup>

External evidence also suggests that Lombard manuscripts may have been available to the Limbourgs, since the inventories of the Duc de Berry list items called 'ouvrages de Lombardie' which are generally understood to refer to manuscripts of Lombard origin in the duke's library.

While Lombard naturalism appears to have contributed to a Franco-Flemish product in the International Gothic Style, in North Italy the Lombard school of manuscript illustrators, with their specializing in naturalistic plant and animal portrayals, seem to have been among the chief practitioners of the International Gothic Style, or were the teachers of those who practised in the style. At this point, however, the connection between Lombard naturalism and the International Gothic Style as it was manifested in Italy

becomes rather tenuous, since it is impossible to establish which takes precedence--the Lombards' influence on the International Gothic Style, or the influence of this style on existing predilections among the Lombard painters and manuscript illustrators.

The coincidence, however, cannot be ignored. Furthermore, the fact that Pisanello, the major figure in the Italian International Gothic Style, was the chief instrument for improving on the naturalistic animal studies of the earlier Lombard artists is indisputable. His drawings of animals, for example the one discussed above, reach a peak of accurate description that was not surpassed until Leonardo. These very tendencies toward minute and accurate detail suggest that Pisanello owed his training to manuscript illustrators, possibly in Verona.

Pisanello's peculiar genius lay in capturing the essence of the animals he observed, their characteristic pose and peculiar texture, whether that happened to be fur, feathers, or reptilian scale. Certain of his early drawings show the influence of Giovanni de Grassi, and in such drawings as the Leopard and Columns<sup>5</sup> the decorative tendencies of the International Gothic style are quite evident. However, his later work, like the unfinished Study of a Dog's Head,<sup>6</sup> goes beyond decorative pattern and mere objective observation of externals and seizes the animal's distinguishing traits of intelligence and submission.

The watercolour studies of birds, including the falcon previously discussed, are observed first of all with an objectivity and thoroughness that belongs to the scientist. This extreme concern for detail in the studies of birds<sup>7</sup> results in a static quality. In at least a few other drawings, for example the Studies of Lynxes, a Wolf and Wildcat,<sup>8</sup> he manages to seize the expressive features of the animals as well.

Yet if Pisanello's drawings are impartially judged, it is clear that frequently life and movement eluded his pen. He is superbe and unsurpassed in rendering detail accurately and minutely, in the craftsmanship of line and its exploitation for decorative effect, in the seizure of an attitude--but like the subjects of the earlier naturalists, his too retain the qualities of still-life. It is these qualities that eventually characterize the animals in a painting like the Vision of St. Eustace, the same qualities that denote both the International Gothic Style and the link with the naturalistic manuscript illustrators of the past.

Thus the ultimate contribution of the naturalistic portrayal of plants and animals in Italian manuscript illustration was the introduction of a highly developed, and curious examination of the natural world into a part of the mainstream of Italian painting, thereby making a small, but not insignificant mark upon the character of quattrocento Italian art as a whole.



## FOOTNOTES

### INTRODUCTION

1 Thomas Muro, "Meanings of Naturalism in Philosophy and Aesthetics," Journal of Aesthetics, Vol. XIX, No. 2, (Winter 1960) p. 133.

2 Loc. cit.

3 Lorenzo Ghiberti, I Commentarii, Typescript translation by the staff of the Courtauld Institute of Art.

4 Leon Battista Alberti, Della Pittura, edited by L. Mallet, Florence, Sansoni, 1950.

5 Cennino Cennini, The Book of the Art of Cennino Cennini, translated by C. J. Herringham, London, Allen and Unwin, 1899.

6 Ibid., p. 22-3.

7 Erwin Panofsky, Meaning in the Visual Arts, Garden City, New York, Anchor Books, 1955, p. 74.

8 Kenneth Clark, The Nude: A Study in Ideal Form, Garden City, New York, Anchor Books, 1959, p. 32.

9 Cennini, op.cit., p. 76.

### CHAPTER I

1 A. C. Crombie, "Cybo d'Hyères: A Fourteenth Century Zoologist," Endeavour, 1952, p. 183.

2 Loc. cit.; also in T. H. White, The Bestiary, New York, Putnam's, 1960, p. 233.

3 Charles Homer Haskins, The Renaissance of the Twelfth Century, Cleveland, World Publishing, 1963, p. 332.

4 Lynn Thorndike, History of Magic and Experimental Science, Vol. II, New York, MacMillan, 1929, p. 532.

- 5 Ibid., p. 534.
- 6 Ibid., p. 535.
- 7 Ibid., p. 536.
- 8 A. C. Crombie, Medieval and Early Modern Science: Science in the Middle Ages, V-XIII Centuries, Garden City, New York, Anchor Books, 1959, p. 142.
- 9 Loc. cit.
- 10 Crombie, "Cybo," op. cit., p. 184.
- 11 Loc. cit.
- 12 Thorndike, op. cit., Vol. II, p. 526.
- 13 Ibid., p. 540.
- 14 Crombie, "Cybo," op. cit., p. 184.
- 15 Crombie, Medieval and Early Modern Science, Vol. I, Plate XVI.
- 16 British Museum MS Royal 12.C.xix, Crombie, ibid., Plate XII.
- 17 Villard de Honnecourt, The Sketchbook of Villard de Honnecourt, ed. Theodore Bowie, Bloomington, Indiana University, 1959, p. 51.
- 18 Ibid., quoted by Emile Mâle, The Gothic Image, New York, Harper Torch Books, 1958, p. 55.
- 19 Villard de Honnecourt, op. cit., p. 46.
- 20 Mâle, op. cit., figure 20.
- 21 Crombie, "Cybo," op. cit., p. 184, and Thorndike, op. cit., p. 466.
- 22 Mâle, op. cit., p. 53.
- 23 Ibid., p. 54.
- 24 Robert S. Hoyt, Europe in the Middle Ages, New York, Harcourt, Brace & World, 1957, p. 486.
- 25 Otto Pacht, "Early Italian Nature Studies and the Early Calendar Landscape," Journal of the Warburg and Courtauld Institute, Vol. XIII, p. 22.

26 W. K. Ferguson, Europe in Transition 1300-1520, Boston Houghton Mifflin, 1962, p. 151.

27 Hoyt, op. cit., p. 560.

28 Pächt, "Nature Studies," op. cit., p. 22.

29 Gian Galeazzo's annual income from his territories, circa 1400, was 1,200,000 florins, according to the estimate of Ferguson, op. cit., p. 157.

30 Plinius Secundus, The Elder Pliny's Chapters on the History of Art, translated by K. Jex-Blake, commentary and introduction by E. Sellers, Chicago, Argonaut, (1896) 1968, pp. 47, 45, 31.

31 H. B. Gutman, "The Rebirth of the Fine Arts and Franciscan Thought," Franciscan Studies, Vol. 26, (Sept. 1945) p. 217.

32 Loc. cit.

33 Nouvelles Etudes d'Histoire Religieuse, Paris, 1884, cited loc. cit.

34 Henry Thode, Franz von Assisi und die Anfänge der Kunst der Renaissance in Italien, Berlin, 1889.

35 Ibid., p. 79.

36 Among them Henri Focillon, "Saint Francois d'Assise et la Peinture Italienne au XIIIe et au XIVe siècles," in Moyen Age: Survivances et Réveils, New York, Brentano's, 1943; and René Jullian, "Le Franciscanisme et l'art Italienne," Phoebus I, 1946.

37 Gutman, op. cit., p. 215, *passim*.

38 Ibid., p. 222.

## CHAPTER II

1 C. A. Wood, Frederick II, The Art of Falconry, Stanford, University Press, 1943, p. lxi.

2 Loc. cit.; the microfilm available to me was in black and white only.

3 Loc. cit.

4 Pächt, "Nature Studies," op. cit., p. 13 ff.

5 C. H. Haskins in Studies in the History of Medieval Science, 2nd ed., Cambridge, Mass., 1927, Chapter XIV, quotes some contemporary evidence that Frederick's copy, captured in Pavia in 1248, contained proper text illustrations.

6 Pächt, "Nature Studies," op. cit. Throughout this chapter, I have had to rely on Pächt's outstanding article on the development of nature studies and Italy's role in this area of art. While Pächt does not go deeply into the background of this development, he has brought most of the relevant manuscripts (some not published elsewhere) together.

7 Figure 8, an illumination from a Moralized Bible, M240, f. 8, French, Paris, 1226-34, in Metropolitan Museum of Art Miniatures: Medieval Vista, New York, 1953.

8 This might be due to the fact that there is a certain stylistic discrepancy between the emperor's portrait and the avian illustrations proper (according to Vollbach, quoted and seconded by Pächt in "Nature Studies," p. 23, note 3). It seems to me, however, from the admittedly inadequate evidence of the microfilm, that there might be still another hand involved; the illustrations from folio 49v-52 and possibly folios 58, 58v, and 75 are by a third hand, or at least not by the same hand as the bulk of the bird paintings; the outlines are heavier and thicker, and there is a conscious attempt at putting the figures and birds in a decorative background of little hills and vegetation which are sharply defined in contour, that contrasts with the freely disposed and unconfined drawings of birds and animals found on the other folios.

9 Folio 76; folios 98, 99, and 100 show a similar sequential action of a man with a falcon mounting a horse and riding away, with one drawing showing the man putting a foot in the stirrup, and on the next page lifting himself halfway off the ground.

10 Pächt, "Nature Studies," op. cit., p. 21.

11 Ibid., p. 18, also note 2 on same page.

12 Loc. cit.

13 Crombie, "Cybo," p. 184, cites R. Flowers, British Museum Quarterly, VIII, 128, 1934.

14 John White, Art and Architecture in Italy 1200-1400, Harmondsworth, Middlesex, Penguin, pp. 384-5; also Pächt, "Nature Studies," op. cit. p. 21.

- 15 Crombie, in "Cybo," op. cit., p. 187, cites Flowers, op. cit.
- 16 Crombie, loc. cit., citing Flowers; also P. Toesca, La Pittura e la Miniatura nella Lombardia, Milan, Ulrico Hoepli, 1912, p. 411.
- 17 Crombie, loc. cit.
- 18 Thieme/Becker, Allgemeines Lexikon der Bildenden Künstler, Leipzig, 1913, Vol. VIII, p. 234.
- 19 Pächt, "Nature Studies," op. cit. p. 21.
- 20 Crombie, "Cybo," op. cit. p. 187.
- 21 Pächt, "Nature Studies," op. cit., p. 21.
- 22 Otto Pächt, The Master of Mary of Burgundy, London, 1948, p. 29, Plate 42a.
- 23 Pächt, "Nature Studies," op. cit. p. 21.
- 24 Loc. cit., note 4.
- 25 Pächt, loc. cit., and in note 5, cites a miniature from Add. MS 27695 folio 13 (reproduced in Reproductions from Illuminated Manuscripts, British Museum, Vol. IV, Plate XXX;) The miniature, illustrating the vice of gluttony, shows a Tartar Khan, an oriental subject; the artist also "seems to have aimed at the specific decorative effect typical of Oriental miniature painting and has certainly succeeded in giving his picture an exotic appearance." It should also be mentioned that Genoa carried on considerable trade with the Orient.
- 26 Crombie, "Cybo," figures 1, 2, 4, MS Add. 28841, folios 4, 5, and 7 verso respectively.
- 27 Crombie, ibid., had enlisted the staff of the British Museum (Natural History) to identify the animals; for example, in folio 4, the insects have been identified as follows: beginning top left, and reading clockwise round the margin: caterpillar, uncertain, possibly Lasiocampid moth; bumble bee, *Bombus rueratus* Fab (?); dragon-fly; Psychid moth (?); wasp, gen. Crabro; immature grasshopper, gen. Pholidoptera (?); great peacock moth, *Saturnia pyri*; butterfly unidentified; reading down centre: Ichneumonid wasp, gen. Gravenhostia; carpet beetle, *Attagenus pellio*. Similarly exact identifications were possible in folio 5, showing shells and crustaceans, and in folio 7 verso with more insects.

28 There are of course, some discrepancies; on folio 7 verso, MS Add. 28841, a lizard is smaller than a grasshopper and spider on the same page.

29 One must remember that this manuscript is really a miniature, the pages being only  $6\frac{1}{2}$  x 4 inches, so that even these tiny creatures had to be reduced in scale to some extent.

30 Pächt, "Nature Studies," op. cit., p. 22.

31 Frederick II's treatise also shows greater naturalism in the rendering of birds than in the human figure.

32 Pächt, "Nature Studies," op. cit., p. 22.

33 Ibid., p. 5.

34 White, Art and Architecture, p. 383.

35 Ibid., p. 383-4.

36 Ibid., p. 384.

37 Pächt, "Nature Studies," op. cit. p. 15.

38 Loc. cit. Only two reproductions, both of birds, were available to me besides the drawing of a boar being attacked by hounds that was the model for the 'l'hallali du sanglier' miniature in the Très Riches Heures.

39 Loc. cit. and p. 16 for example, an ostrich in the Bergamo volume that recurs in MS 459 of the Casanatense in Rome, with the title Historia Plantarum, but which Pächt states to be an encyclopedia of natural history; see also note 2 on the same page.

40 But see Pächt, ibid., p. 16, note 2, for another scholar's doubts concerning this.

41 Loc. cit., note 4.

42 Ibid., p. 17.

43 Loc. cit.

44 Loc. cit. note 2.

45 Agnes Arber, Herbals, Cambridge University Press, 1938, p. 1.

46 Charles Singer, "The Herbal in Antiquity and its Transmission to Later Ages," Journal of Hellenic Studies, Vol. XLVII, 1927, p. 1 ff.

47 A full-color facsimile reproduction of this manuscript was available for me to study.

48 Arber, op. cit., Chapter I, *passim*.

49 Pacht, "Nature Studies," op. cit., p. 26.

50 MS Ashmolean 1431, folio 21, reproduced in The Flowering of the Middle Ages, edited by Joan Evans, New York, McGraw-Hill, 1966, p. 190.

51 Pacht, in "Nature Studies," p. 27, and note 1, quotes Pliny's warning about the unreliability of herbal illustrations in the Historia Naturalis, XXV, 2.

52 Pacht, ibid., p. 28.

53 Loc. cit., note 4.

54 MS Arab. d. 138, folio 102, in the Bodleian Library at Oxford, reproduced in Evans, op. cit., p. 190.

55 Pacht, "Nature Studies," op. cit., p. 30.

56 Ibid., p. 31.

57 Loc. cit.

58 Ibid., p. 30.

59 Loc. cit.

### CHAPTER III

1-H. Buchthal in "Early Islamic Miniatures from Baghdad," Journal of the Walters Art Gallery, Vol. V, Baltimore, 1924, p. 19 ff, believed that these genre scenes were the original invention of the Oriental Dioscorides illustrations, cited by Pacht, ibid., p. 33, note 3. But Pacht, loc. cit., demonstrates that these so called 'genre' scenes originated in late classical herbal illustrations, since similar genre illustrations can be found in the two western illustrated herbals in manuscripts in Turin and London.

2 G. Sarton, Introduction to the History of Science, Baltimore, 1931, Vol. II, p. 71. The word 'tacuinum' or 'taqwin' is Arabic for tables, i.e. referring to the arrangement of the text in tables. 'Tacuinum Sanitatis' therefore means tables of health, according to L. Thorndike and G. Sarton, Isis, Vol. 10, 1928, p. 489 ff. The Arabic text, of which no illustrated copies are known, was translated into Latin in the second half of the thirteenth century, probably in Southern Italy, and possibly under the auspices of Manfred, son of Frederick II, between circa 1258 and 1266. Pächt, ibid., p. 35, note 1.

3 Pächt, ibid., p. 36.

4 Ibid., Plate 12, figure 6.

5 Loc. cit., figure 6.

6 Ibid., p. 36.

7 A facsimile reproduction in colour was available for me to study in the Woodward Library.

8 Pächt, "Nature Studies," op. cit., p. 37. Two Anglo-Saxon manuscripts dating from the early eleventh century, in the British Museum (Cotton MSS Julius A VI, and Tiberius B V) have a set of calendar pictures that are similarly lacking in the customary allegorical figures of the four seasons. See J. C. Webster, The Labours of the Months in Antique and Medieval Art, Chicago, 1938, p. 53 ff, Plates XVII and XIX.

9 Antonio Morassi, Pittura nella Venezia Tridentina, dalle origini alla fine del quattrocento, La Libreria dello Stato, Anno XII, E. F., p. 273.

10 Ibid., p. 278.

11 Ibid., p. 280.

12 Ibid., p. 288.

13 Loc. cit.

14 Erwin Panofsky, Early Netherlandish Painting, Cambridge, Mass., Harvard University Press, 1966, p. 66.

15 It is rather difficult to judge from Figure 163, p. 273, in Morassi, op. cit., just how far above ground level the frescoes are.



16 But not in every scene: the miniature of the Meeting of the Three Magi in the Très Riches Heures has some typical Italianate cliffs in the background, but the exotic subject matter of the scene may be responsible for this departure from naturalism.

17 Kathryn Bloom in "Lorenzo Ghiberti's Space in Relief: Method and Theory," Art Bulletin, Vol. LI, Number 2, June 1969, p. 167, suggests that in the Torre Aquila frescoes a common medieval practice of laying relief space out in vertical zones and measuring in simple units of common fractions, is followed. According to Bloom, the panels are divided into zones based on the heights of the foreground figures, with the June fresco, for example, being divided into four zones based on the height of the figures in the immediate foreground. Thus the distance from the heads of the foreground figures to the gate is equal to the height of the gate; the distance from the top of the gatehouse to the upper frame is slightly greater than the height of the gate, as is the lower zone.

18 Morassi, op. cit., Figure 170, p. 282.

19 Panofsky, Early Netherlandish Painting, p. 65.

20 It is, however, difficult to deduce the success of the snowscapes from a black and white photo made from a fresco in a not quite perfect state of preservation.

21 Enio Sindona, Pisanello, New York, Abrams, Supplementary Illustrations Figure 10.

22 Ibid., Plate 167.

## CONCLUSION

1 Henrik Schulte-Nordholt, "Die Geistesgeschichtliche Situation der Zeit um 1400," in Europäische Kunst um 1400, May 7 - July 31, 1962, Wien, Kunsthistorisches Museum, p. 28.

2 Panofsky, Early Netherlandish Painting, p. 67.

3 Martin Conway, "Giovanni de Grassi and the Brothers Van Limbourg," Burlington Magazine, Vol. 18, 1910-11, p. 149.

4 All these instances of Italian influence are cited by Panofsky in Early Netherlandish Painting, p. 64.

5 Sindona, op. cit., Plate 27.

6. Ibid., Plate 130.

7 Ibid., Plates 129, 143, 167.

8 Ibid., Plates 165, 163.

# BIBLIOGRAPHY

- Alberti, Leon Battista. Della Pittura. Edited by L. Malle, Florence, Sansoni, 1950.
- Arber, Agnes. Herbals. Cambridge, University Press, 1938.
- Arslan, Edoardo. "Riflessioni sulla pittura gotica 'internazionale' in Lombardia nel tardo trecento," Arte Lombarda, Vol. 8, 1963, pp. 25-66.
- Biese, A. The Development of the Feeling for Nature in the Middle Ages and Modern Times. London, 1905.
- Bloom, Kathryn. "Lorenzo Ghiberti's Space in Relief: Method and Theory," Art Bulletin, Vol. LI, No. 2, June 1969, pp. 164-69.
- Blunt, Sir Anthony. Artistic Theory in Italy 1450-1600. London Oxford University Press, 1962.
- Brenzoni, Raffaello. L'arte pittorica di Pisanello nelle sue opere autentiche. Firenze, Leo Olschki, (1955).
- Bunim, M. S. Space in Medieval Painting and the Forerunners of Perspective, London, Oxford, 1947.
- Butterfield, H. The Origins of Modern Science 1300-1800. London, Bell, 1958.
- Carlie, E. "The Beginnings of Landscape Painting in Italy," Graphis, Vol. II, No. 61, pp. 378-85.
- Cecchi, Emilio. Sienese Painters of the Trecento. London, Frederick, Warne, 1931.
- Cennini, Cennino. The Book of the Art of Cennino Cennini. Translated by C. J. Herringham, London, Allen and Unwin, 1899.
- Clark, Sir Kenneth. The Nude: A Study in Ideal Form. Garden City, New York, Anchor Books, 1959.
- Conway, Martin. "Giovanni de Grassi and the Brothers Van Limbourg," Burlington Magazine, Vol. 18, 1910-11, pp. 144-49.

- Crombie, A. C. "Cybo d'Hyères: A Fourteenth Century Zoologist," Endeavour, Vol. XI, 1952, pp. 183-87.
- Crombie, A. C. Medieval and Early Modern Science. 2 vols. Garden City, New York, Anchor Books, 1959.
- Degenhart, B. Antonio Pisanello. Torino, Chiantore, (1945).
- Du Chene, M. and A. Giobbio. "Alcune note sulla miniatura nella 'Mostra d'arte Lombarda dai Visconti agli Sforza'", Arte Lombarda, Vol. 4, No. 1, 1959-60, pp. 52-7.
- Dupont, Jacques and Cesare Gnudi. The Great Centuries of Gothic Painting. Geneva, Skira, 1954.
- Durrieu, P. La peinture en France, histoire de l'art depuis les premiers temps chrétiens jusqu'à nos jours. Vol. III, Part I, Librairie Armand Colin, 1907.
- Dvorak, Max. Idealism and Naturalism in Gothic Art. University of Notre Dame, 1968.
- Evans, Joan, ed. The Flowering of the Middle Ages. New York, McGraw-Hill, 1966.
- Ferguson, W. K. Europe in Transition 1300-1520. Boston, Houghton Mifflin, 1962.
- Focillon, Henri. "Saint Francois d'Assise et la peinture Italienne au XIIIe et au XIVe siècles," Etudes d'art et d'histoire. New York? Brentano's, 1943, pp. 134-52.
- Frederick II, Hohenstaufen. De Arte Venandi cum Avibus. (MS Pal. Lat. 1071, the Vatican). Microfilm.
- Frederick II, Hohenstaufen. De Arte Venandi cum Avibus. (MS Pal. Lat. 1071, the Vatican). Facsimile Edition, Graz, Akademische Druck, 1969.
- Friedlander, Max J. Landscape, Portrait, Still-life: Their Origin and Development. New York, Schocken Books, 1963.
- Ghiberti, Lorenzo. I Commentarii. Typescript translation by the staff of the Courtauld Institute of Art.

- Gombrich, Ernest. "The Renaissance Theory of Art and the Rise of Landscape," in Norm and Form, London, Phaidon, 1966, pp. 107-21.
- Gutman, H. B. "The Rebirth of the Fine Arts and Franciscan Thought," Franciscan Studies, Vol. 26, September, 1945, pp. 215-34.
- Haskins, Charles Homer. The Renaissance of the Twelfth Century. Cleveland, World Publishing, 1963.
- Haskins, Charles Homer. Studies in the History of Medieval Science. 2nd ed. Cambridge, Massachusetts, 1927.
- Hill, G. F. Drawings by Pisanello: A Selection with Introduction and Notes. New York, Dover, 1965 (1929).
- Hill, G. F. Pisanello. London, Duckworth, 1905.
- Honnecourt, Villard de. The Sketchbook of Villard de Honnecourt. Edited by Theodore Bowie, Bloomington, Indiana University, 1959.
- Hoyt, Robert S. Europe in the Middle Ages. New York, Harcourt, Brace, & World, 1957.
- Huizinga, Johan. The Waning of the Middle Ages. Garden City, New York, Doubleday Anchor Books, 1949.
- Jameson, Anna. Legends of the Monastic Orders as Represented in the Fine Arts. Boston, Houghton Mifflin, 1891.
- Janson, H. W. Donatello. Princeton, New Jersey, University Press, 1963.
- Jullian, R. "Le Franciscanisme et l'art Italien," Phoebus, Vol. I, 1946, pp. 105-15.
- Kaftal, George. Iconography of the Saints in Central and South Italian Painting. Florence, Sansoni, 1965.
- Kaftal, George. Iconography of the Saints in Tuscan Painting. Florence, Sansoni, 1952.
- Kallab, Wolfgang. "Die toskanische Landschaftsmalerei in XIV und XV Jahrhundert. Ihre Entstehung und Entwicklung," Jahrbuch der Kunsthistorischen Sammlungen des aller höchsten Kaiserhauses. Vol. XXI, 1900, pp. 1-90.

- Kantorowicz, E. Frederick the Second, 1194-1250. London, Constable, 1931.
- Kay, George R., ed. The Penguin Book of Italian Verse. Harmondsworth, Middlesex, Penguin Books, 1958.
- Krautheimer, R. Lorenzo Ghiberti. Princeton, University Press, 1956.
- Mâle, Emile. The Gothic Image: Religious Art in France of the Thirteenth Century. New York, Harper Torch Books, 1958.
- Marle, Raimond van. The Development of the Italian Schools of Painting. The Hague, Martinus Mijhoff, 1923-38.
- Mather, J. F. A History of Italian Painting. New York, Henry Holt, 1938.
- Meiss, Millard. French Painting in the Time of Jean de Berry, New York, Praeger, 1968.
- Meiss, Millard. Giotto and Assisi. New York, University Press, 1960.
- Meiss, Millard. "Highlands in the Lowlands: Jan Van Eyck, the Master of Flémalle and the Franco-Italian Tradition," Gazette des Beaux Arts, Vol. LVII, May 1961, pp. 273-314.
- Meiss, Millard. Painting in Florence and Siena after the Black Death. New York, Harper Torchbooks, 1951.
- Metropolitan Museum of Art Miniatures: Medieval Vista. New York, 1953.
- Miller, William B. Franciscan Legend in Italian Painting in the Thirteenth Century. Dissertation, Columbia University, 1961. University Microfilms.
- Morand, Kathleen. Jean Pucelle. London, Oxford University Press, 1962.
- Morassi, Antonio. Pittura nella Venezia tridentina, dalle origine alla fine del quattrocento. La Libreria dello Stato, Anno XII (1912?).
- Munro, Thomas, "Meanings of Naturalism in Philosophy and Aesthetics," Journal of Aesthetics, Vol. XIX, No. 2, Winter 1960, pp. 133-37.
- Pächt, Otto. "Early Italian Nature Studies and the Early Calendar Landscape," Journal of the Warburg and Courtauld Institute, Vol. XIII, 1950, pp. 13-47.

- Pächt, Otto. "The Limbourgs and Pisanello," Gazette des Beaux Arts, Vol. 62, September 1963, pp.
- Pächt, Otto. The Master of Mary of Burgundy. London, 1948.
- Panofsky, Erwin. Early Netherlandish Painting. Cambridge, Massachusetts, Harvard University Press, 1966.
- Panofsky, Erwin. Meaning in the Visual Arts. Garden City, New York, Anchor Books, 1955.
- Panofsky, Erwin. Renaissance and Renascences. Harvard, University Press, 1957.
- Pirenne, Henri. A History of Europe. Vol. II. From the Invasions to the XVI Century. New York, W. W. Norton, 1939.
- Plinius Secundus. The Elder Pliny's Chapters on the History of Art. Translated by K. Jex-Blake, with commentary and historical introduction by E. Sellers. Chicago, Argonaut, (1896) 1968.
- Porcher, Jean, ed. Les Très Riches Heures du Duc de Berry: Le Calendrier. Paris, Editions Nomis, n.d.
- Richter, G. M. "Pisanello Studies," Burlington Magazine, Vo. 55 1929, pp. 58, 128.
- Richter, G. M. "Pisanello Again," Burlington Magazine, Vol. 58, 1931, pp. 235-41.
- Salvini, Roberto and Leone Traverso. The Predella from the XIIIth to the XVIth Centuries. London, Faber and Faber, (1960).
- Sarton, G. Introduction to the History of Science. Baltimore, Williams, & Wilkins, 1931, (c1927).
- Schlosser, Julius. "Ein Veronesisches Bilderbuch und die höfische Kunst des XIV Jahrhunderts," Jahrbuch der Kunsthistorischen Sammlungen des aller höchsten Kaiserhauses, Vol. XVI, Wien, 1895, pp. 144-230.
- Schulte-Nordholt, Hendrik. "Die Geistesgeschichtliche Situation der Zeit um 1400," in Europäische Kunst um 1400, May 7 - July 31, 1962, Wien, Kunsthistorisches Museum.
- Sindona, Enio. Pisanello. New York. Abrams, 1961.
- Singer, Charles. "The Herbal in Antiquity and its Transmission to Later Ages," Journal of Hellenic Studies, Vol. XLVII, 1927, pp. 1-53.
- Spencer, E. P. "The International Style and Fifteenth Century Illuminations," Parnassus, Vol. XII, March, 1940, p. 30.

- Thieme/Becker. Allgemeines Lexikon der Bildenden Künstler, Leipzig, 1913-.
- Thode, Henry. Franz von Assisi und die Anfänge der Kunst der Renaissance in Italien. Berlin, 1889.
- Thode, Henry. Giotto. Leipzig, Velhagen & Klasing, 1926.
- Thorndike, Lynn. History of Magic and Experimental Science. New York, MacMillan, 1929.
- Thorndike, Lynn and F. S. Benjamin. The Herbal of Rufinus. Chicago, 1945.
- Toesca, Pietro. La pittura e la miniatura nella Lombardia. Milan, Ulrico Hoepli, 1912.
- Tovell, Ruth. Flemish Artists of the Valois Courts. Toronto, University of Toronto Press, 1950.
- The Très Riches Heures of Jean, Duke of Berry. Introduction by by Jean Longnon and Raymond Cazelles. Preface by Millard Meiss. New York, Braziller, 1969.
- Trevelyan, Janet Penrose. A Short History of the Italian People. Rev. ed. London, Allen and Unwin, 1959 (c1956).
- Turner, A. Richard. The Vision of Landscape in Renaissance Italy. Princeton, University Press, 1966.
- Verdier, Philippe, ed. The International Style: The Arts in Europe Around 1400, October 23-December 2, 1962. Baltimore, The Walters Art Gallery.
- Vienna. Austrian National Library. Dioskurides. (Cod. Med. gr.1) Facsimile edition. Graz, Akademische Druck, 1966.
- Vienna. Austrian National Library. Tacuinum Sanitatis in Medicina. (Ser. no. 2644) Facsimile edition. Graz, Akademische Druck, 1966.
- Webster, J. C. The Labours of the Months in Antique and Medieval Art. Chicago, 1938.
- Weiss, Roberto. "Jan Van Eyck and the Italians," Part I, Italian Studies, Vol. XI, 1956, pp. 1-15.



White, John. Art and Architecture in Italy 1200-1400. Harmondsworth, Middlesex, Penguin, 1966.

White, John. The Birth and Rebirth of Pictorial Space. London, Faber and Faber, 1957.

White, T. H. The Bestiary: A Book of Beasts, Being a Translation from a Latin Bestiary of the Twelfth Century. New York, Putman's, 1960.

Winkler, F. "Paul de Limbourg in Florence," Burlington Magazine, Vol. 56, 1930, pp. 95-6.

Wood, C. A. Frederick II, The Art of Falconry. Stanford, Stanford University, 1943.