THE "SCIENTIFIC" STUDY OF NATURE REFLECTED IN THE COMPOSITION OF THE VEGETATION IN LATE-MEDIEVAL PAINTINGS

BY

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Reading this title one might wonder what these two matters, the "scientific" study of nature and the composition of the vegetation in the art of painting have in common. I shall try to make clear that the plant we find in the transitional period in the art of painting of the late-Middle Ages to the Renaissance does indeed have a bearing upon the plant we find described and depicted in the earliest printed herbals and that the function of this plant in art, at least partly, found its origin in the incunabulum best-known to us, the "Gart der Gesundheit".

To what extent this relation between art and science, as to the world of plants, is direct appears to be hard to establish. It is certain that art and science have gone through a development showing parallels and it is certain that data, provided by the arts, contain as much botanical information as the herbals.

Medicinal botany and with that the herbal, owing to the invention of printing, has gone through an accelerated development, which we shall follow in short. First, however, I shall give a definition of a herbal: It is a book with names and descriptions of plants with their characteristic properties (illustrations, therefore, are unnecessary). It was initially meant as a medical guide for everyone who was able to read and write.

The three most important incunabula, which appeared before 1500 and which were well-known to many people and therefore probably also to the artists at the end of the 15th century and the beginning of the 16th century, are the *Herbarius* in a Latin publication from 1484, the *Gart der Gesundheit* from 1485 and the *Hortus sanitatis* from 1491.

As the "Gart der Gesundheit" was the most widely spread of all botanical information till 1530 I shall give an extensive sketch of this herbal.

From an elaborate introduction, that is if it can be trusted, we know

Acorus geel lilien ¶ Capi. xxi.
Acorus vel spatella latine. Glaspatella vel Affodrisia vel ve
nerea vel pyperapiū grece. Arabice vero lacq vel hollegi vel
Naeq vel kegog vel zweg ¶ Der meister Galienus in dem
achten büch genant simplicium farmaciarū in dem capitel Acorus
spricht daz der sy heyß vnd drücken an dem andern grat. vnd Auicē
na Serapio Platearius Diascorides synt diß bewerern. ¶ Item er

Ires pseudacorus, Gart der Gesundheit, 1485.

that this work in the first place was composed "in admiration of God's creation". As the health of man is dependent on nature and the potency of herbs, as the publisher can tell us, he could wish for no more beautiful and useful work than to collect in a book these herbs and their properties.

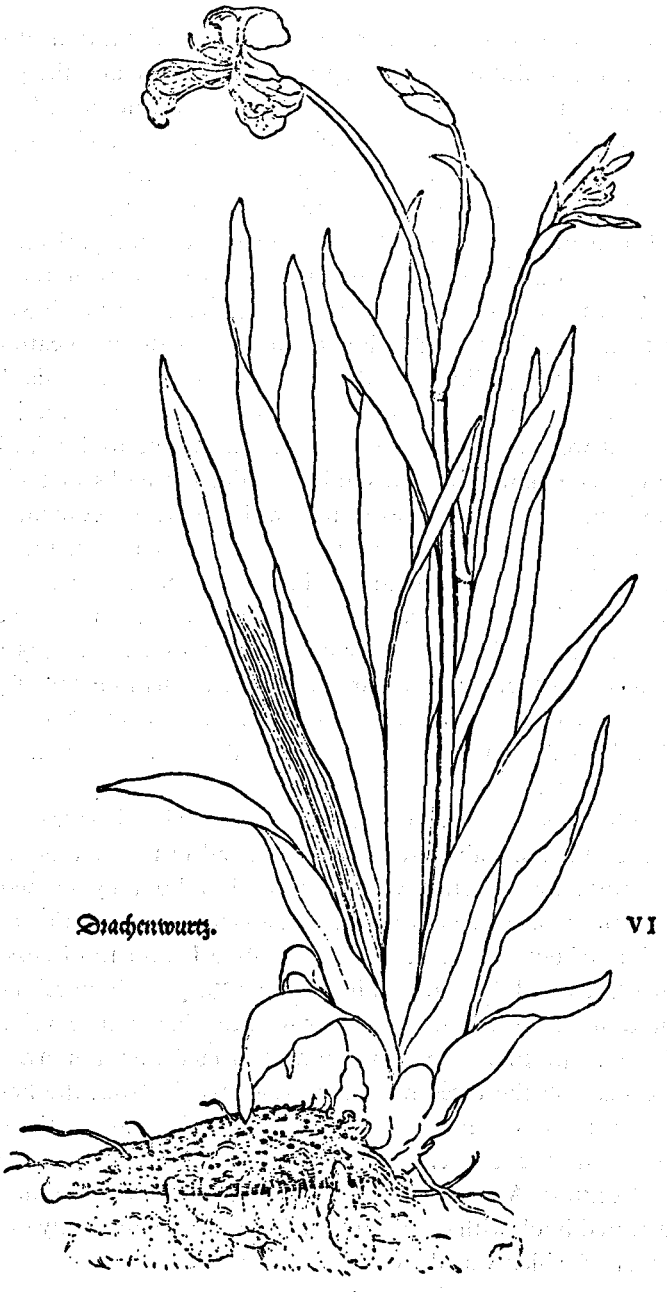
He started, he writes, from classic texts such as GALENUS, AVICENNA, DIOSCORIDES, PLATEARIUS and many others, and from these he had the plants and their properties compiled by a doctor. On comparison with a German flora the publisher soon found that many plants from the classic text were not found in Germany and therefore he could not have them drawn in their true forms and colours. Thereupon the publication was suspended and an expedition to the Mediterranean area, Asia Minor and Egypt was equipped. It is not certain in what company the journey was made, but we can read in the introduction that he took with him a painter/draughtsman, who now was able to paint the herbs in their true form. Thus a herbal came into existence, which as to its contents, does not tell us anything more than the use of herbs taken from the classic herbals, but which as to its illustrations, in any case partly, offers sketches of a natural rendering of herbs, which must have been achieved by observation in nature. The publisher himself says that of the 435 plants 350 were drawn in their true colours and forms. This number of 350 is highly exaggerated. However, there is a clear distinction between the group of realistically reproduced plants and the group of symmetrical, characterless plants.

The three herbals, which appeared before 1500, with their translations in the Low Countries, Italy, France and England in the first 25 years of the 16th century, are a worthy evidence of Medieval botany, immediately followed by the first evidences of the Renaissance botany. For a good understanding of botanical research in that time I want to discuss some of those works as well. We are dealing with an "urge to inquire" both of the authors and the illustrators, which meant a turning in the development of herbals, and with that in the development of medicinal botany.

Before discussing the three most important works from the first half of the 16th century, we first have to know something about the source the authors used for their herbals.

In the 1st century A.D. DIOSCORIDES wrote his "de materia medica", a non-illustrated book with descriptions of plants, alphabetically ordered, every chapter of which was divided in three parts:

a) name and synonyms of the plant,



Iris pseudacorus, LEONART FUCHS, New Kreuterbuch, 1543.

b) botanical description of the plant, with its habitat and flowering time,
c) characteristics of the plant, such as its medical or magical effect.

Renaissance doctors not only consulted DIOSCORIDES' books intensively, but also commented on his works, known in the Middle Ages in numerous manuscripts with numerous appendices and annotations.

Three of these doctors and their medical-botanical works became very famous: Otto BRUNFELS, who in 1530 wrote his "*Herbarum vivae eicones*". Especially the illustrations in his herbal were very naturalistically drawn by Hans WEIDITZ, who brought about a change from rigid symmetry to liveliness and reality.

BRUNFELS worked scientifically as follows: he compared the plants in nature to pictures of the medieval DIOSCORIDES publications, then he described them whether or not according to his own ideas and had a draughtsman draw them again. Just as the publisher of the "Gart der Gesundheit" he was faced with some surprises, because he compared the German flora to the mediterranean one, having no idea of the geographical distribution of plants. The science of plant-geography did not come into existence until the 18th century, although THEOPHRASTOS had already distinguished plant-districts and plant-areas.

The second doctor-herbalist was Hieronymus BOCK, who in 1539 with his *New Kreuterbuch*, in following editions just called *Kreuterbuch*, caused an enormous improvement in the description of plants.

The first edition of his herbal was not illustrated, the descriptions were, however, very extensive. Although he kept to the classification by ARISTOTLE of herbs, shrubs and trees, he put together as much as possible those plants which were "related". The idea "related" meant not much more than putting together plants of about the same height or colour. A first attempt, however, towards a botanical classification had been made. Their place of occurrence and their position were often described. In 1546 an illustrated edition appeared; the largest part of the illustrations was taken from the herbal by Leonart FUCHS, which I shall describe later on. Another part about plants not found in FUCHS was illustrated by David KANDEL.

From the hand of Leonart FUCHS the herbal "*De historia stirpium*" appeared in 1542, which in 1543 was immediately followed by a German edition, entitled "*New Kreuterbuch*". It describes 400 plant species, of which 100 are foreign. The texts as well as the illustrations exceed both its predecessors. Some pictures are unique, as they give plants, which

Papauer magsamen ¶ Cap̄·ccxcix·

Papauer latine·grece animone vel miconiū· arabice caxchax chachili vel cascasy· ¶ In dem bůch genant circa instans beschriben vnd die meister vñ sprechen das da sy zweyerhand magsamē·der eyn wysch am samen·der ander swartz am samen·Der wysch ist von natuer kalt vnd fucht·Der swartz ist kalt vnd drucken von natuer· Den samen sal man sameln im sommer so er gezydiget vnd der weret·v·iar vnuersert· ¶ Vß dissen beyden samen sal man machen eyn plaster vñ dar vnder mischen frauwē milch vñ daz wyß

Papaver somniferum, Gart der Gesundheit, 1485.

are printed in a book for the first time in W. Europe. For instance American species such as *Zea mais* and *Cucurbita maxima*. FUCHS partly made the illustrations himself, however, he also employed a draughtsman and a woodcarver. In later years his illustrations were more often copied than his descriptions, as we have seen by Hieronymus BOCK, later by DODONEUS, TURNER and BAUHINIUS.

In his descriptions FUCHS keeps to an alphabetical order of genera, but he follows the subdivision by DIOSCORIDES, which way of description was copied for the whole of the 16th century, among others by DODONEUS in his herbal of 1554.

Having got a view of the herbals around 1500 in which a first attempt was made to a scientific work, we shall examine to what extent data from these herbals have influenced the art of painting. We shall see that properties of plants described in the herbals must have had their influence on the composition of the vegetation in painting. The function of plants, described according to their properties in the herbals, could be compared to the function of plants in art and it appears to be a symbolic, magic or medicinal function.

By observing the occurrence of plants in art and by noting the differences with the natural composition of the vegetation, a job which actually may only be done by plant-ecologists, a great number of data about the function of a plant on a painting can be collected. Working in this way one could speak of an ecological approach of the plant in arts.

We shall restrict ourselves to the art of painting at the time of the herbals discussed, because in this art the function of the plant is most clearly expressed.

At the end of the 15th century we find ourselves in a transitional phase between the Christian symbolic art of painting and the "free" art of landscape-painting. In Christian symbolic art the landscape acted as background for a Christian representation on that painting and the plants had their own Christian symbolic meaning; in the "free" art of landscape-painting the landscape was depicted "free", i.e. not restricted to a Christian representation and the plants no longer had a separate Christian symbolic meaning, but mostly a medicinal or magic one.

When we talk about a "free" art of landscape-painting a Christian representation is not taboo, but it is of minor importance and a unity with the landscape.

One painting on which the function of the flora has clearly changed

Papaver somniferum, LEONART FUCHS, New Kreuterbuch, 1543.

with regard to the Christian symbolic function, which the flora had in the first half of the 15th century, is "*The Baptism of Christ*" by Gerard DAVID. In the frame of this article the middle panel is of special interest. Therefore we shall first analyse it botanically. We see a number of plants of which the symbolic function is not directly clear. Even with a thorough knowledge of plants and their meaning in the Christian symbolic art from the Middle Ages, many questions will rise.

It is certain that almost all flora elements can be identified and also that those which have been identified can be retraced in the "Gart der Gesundheit". This book gives a good rendering of both indigenous and exotic medicinal herbs cultivated in Medieval gardens.

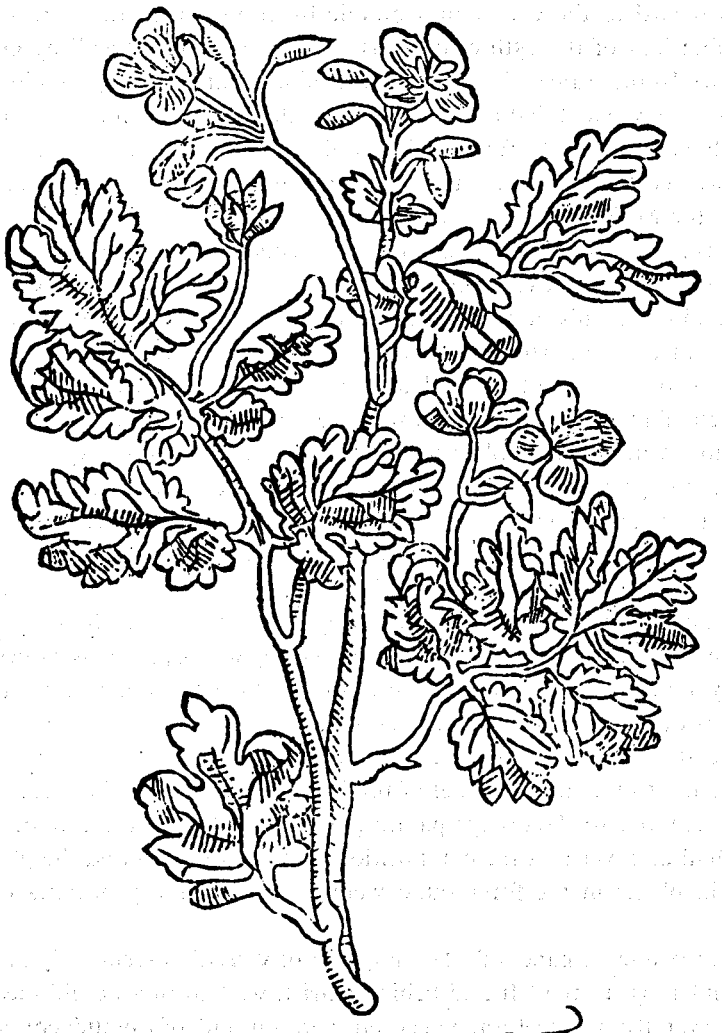
As witness a painting by Dieric BOUTS, depicting a Madonna in a garden of a wealthy commoner, we have some idea of what a herb-garden of those with means looked like at the end of the Middle Ages.

For a large part medical science consisted of the knowledge of herbs and their medicinal properties. Apart from monks and doctors, people who where interested in these matters, could take notice of this science first in Latin, later in German (1485) and later still, in 1514, when the first translation of the "Gart der Gesundheit" appeared, also in Dutch. Knowledge of the properties of herbs must have been fairly wide-spread, as witness the many reprints, in many languages, of the "Gart der Gesundheit", as well as of the later 16th century herbals.

We shall now return to "The Baptism of Christ" by Gerard DAVID. Referring to the middle panel of this painting, which can be regarded as representative for landscape-painting of the first half of the 16th century, we shall discover that the composition of the vegetation and the place of certain plants in the foreground were defined by the properties of the herbs.

On the middle panel of "The Baptism of Christ", presumably painted around 1503, to the left and behind Christ, we find in a humid meadow at a river Rumex acetosa, Leucojum vernum and Iris pseudacorus. On the other bank in the foreground of the painting we find from left to right Viola palustris, Taraxacum officinale, Convallaria maialis, Papaver somniferum and Chelidonium maius. The whole scene has been placed in a humid river forest with Fagus silvatica and Castanea sativa as recognizable tree species.

Certainly not all plants painted on this panel belong to one plantsociological Class, Order or Association. We find elements a Fago-Quercetum,



Celidonia schelwortz Cap·lxxxv·

Celidonia latine·grece chilidonion·arabice hauroch· Serapio in dem büch aggregatoris in dem capitel Hauroch id est Celidonia beschriben vns vnd sprichet daz es ist zweyer hande· Eyn groiß·die ander cleyn· Die grosser schelwürtz erschynet wen die schwalben zů lande kommen·vñ wen die widder hyn enweg fliegen so dorret sye widdervmb·Auch sprechen etlich meister daz diß

Chelidonium maius, Gart de Gesundheit, 1485.

from a Alnion glutinosae and from Ruderal Border vegetations. A plant-sociological plant-association cannot be recognized clearly; this is the more difficult as grasses, sedges, mosses and other lower plants have not or hardly been depicted. An exception in this painting is a number of toadstools, characteristic for humid woods.

By his choice of plants it becomes clear that the artist made his sketches in a natural environment and as witness the occurrence of the Beech this was in a transitional environment between a lower situated Alnion glutinosae and a higher situated Fago-Quercetum, in which the Beech dominates.

All through this we find elements of Ruderal Border vegetations, these are vegetations of plants growing along roads, under hedges and in waste places.

As, in the painting,

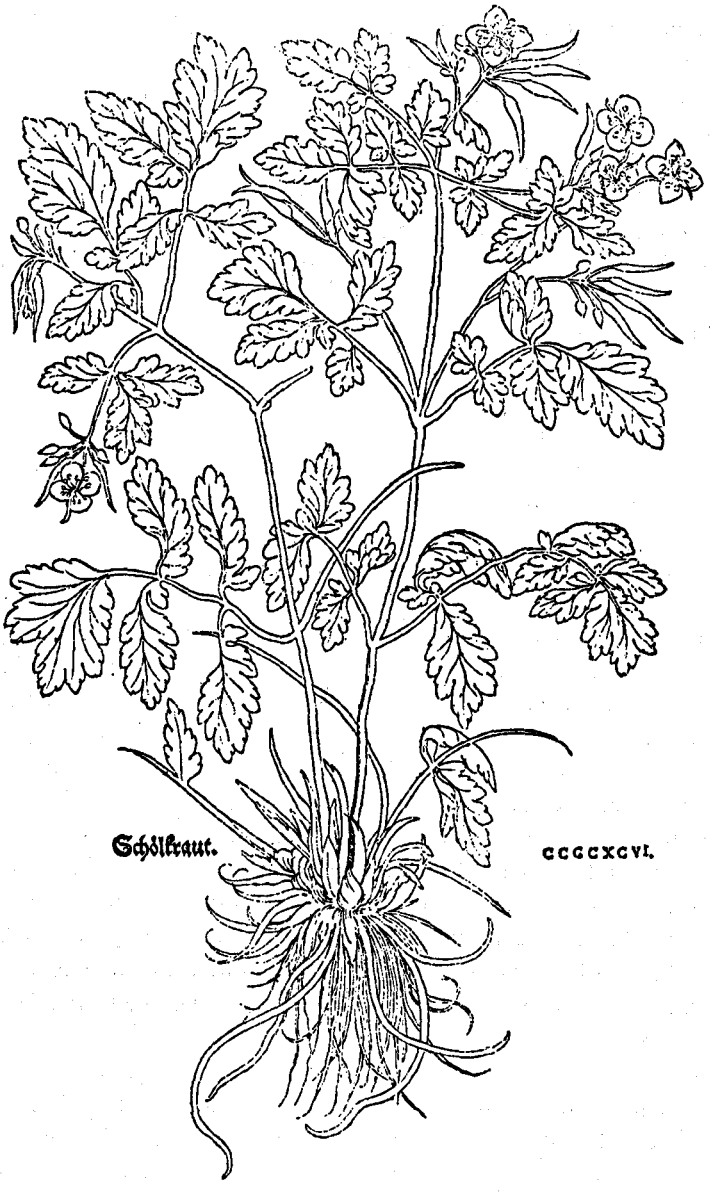
a) we find plants from a transitional area, from an Alnion glutunosae to a Fago-Quercetum, with elements of both, which in itself were painted very naturalistically, but which cannot be distinguished in their recognized plant-sociological associations and

b) we find plants, which are almost all in flower, although this is biologically an irreality, owing to the fact that we are dealing with plants flowering in different seasons (from early spring to summer), we have to conclude that the painted landscape is a reality in parts, but not as a whole. We might wonder whether the artist's choice out of all elements of such a transitional wood, as I have just described, was an accidental or a conscious choice.

Considering the flora-elements separately, after having analyzed the vegetation, and studying the data concerning these plants in the herbals from the time of the making of this painting, especially in the "Gart der Gesundheit", because we may assume that its data were generally known among "men of letters" (Gerard DAVID became a member of the guild in Bruges in 1484), either directly or indirectly, we come to the following conclusions:

1. Alle clearly recognizable plant species appear in the "Gart der Gesundheit" as well as in Leonart FUCHS' herbal, except Viola palustris, a white to lilac slightly veined pansy, probably regarded as a Viola odorata, a plant which as to its place in plant systematics stands next to Viola palustris, and which we find in late-Medieval sources.

2. All plants mentioned posses medicinal properties, varying from a



Chelidonium maius, LEONART FUCHS, New Kreuterbuch, 1543.

generally healing and cleansing medicine to a purgative medicine. One plant forms an exception to this group of plants, the Papaver somniferum, which as to its place in the picture stands in a special position. It is the most conspicuous plant, reaching high above the rest of the vegetation, in the near vicinity of Christ. No cleansing or purgative effect has been ascribed to this plant, but from the green fruit opium is obtained, a sedative drug, which can result in poisoning and death when used in excess.

Knowing from the herbals that all recognizable herbs have a healing and cleansing effect and that the only herb not having this, is a herb with a poisoning effect and seeing all these herbs painted in a landscape forming a background for the Baptism of Christ, an obvious conclusion is that the function of these herbs on the painting is the same as in the herbals, viz. that they serve to cleanse Christ's body, like Baptism cleanses him of all sins, and that Papaver somniferum has a medical symbolic function, viz. poisoning leading to death (in this case Jesus Christ's death).

The place of this plant right in front of the figure of Christ is determined by its medicinal function, described in the herbals.

The place of the remaining herbs is determined more or less naturally, but the choice of herbs must have been made by the artist himself.

Summarizing we can say that in the art of painting from about 1480 till in the second half of the 16th century the plant, in very many cases, has a medicinal, a magic or a Christian symbolic function, while the origin of these functions can usually be traced in the herbals of that time, in contrast to the plant in the art of painting of the first half of the 15th century. For the origin of the symbolic meaning of the plant in question, we have to go back to lithurgic works, to the Biblia Pauperum and especially to the Legenda Aurea.

We have seen that the place of the plant in the painting, particularly when it is a conspicuous place very near or just in front of a person, is determined by its function in the painting, that the place of the other plants is more or less natural but that a specific choice is made from plants of a certain biological environment and that this choice is related to the function these plants have to perform in the scene painted.

Owing to this functional role of the plant in the picture, contrary to what is often postulated, we are not dealing with a "natural" reflection of nature, but with an "apparently natural" reflection of nature, "natural"

GERARD DAVID, The Baptism of Christ, 1503(?).
Stedelijk Museum v. Schone Kunsten, Brugge.

because the form, the structure of the plant is in accordance with reality, but "apparently natural" because the plant in relation to its environment (i.e. the other plants and soil) either does not belong in the place painted or lacks many accompanying plant species.

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