Delpinoa, n.s. **39-40**: 45-70. 1997-98

Historical ethnobotany: an essay on the ethnoscientific approach to ancient botanical treatises

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Riassunto. *Etnobotanica storica: un'analisi sull'approccio etnoscientifico ad un antico trattato botanico.*
L'articolo analizza il trattato greco classico considerato come il più importante nella storia della botanica occidentale fino agli inizi del XIX secolo: il *De materia medica* di Dioscoride d'Anazarba (1° sec. D. C.). Dopo una breve biografia dell'autore e lo *status quaestionis*, viene proposta una lettura dell'opera in chiave *etnobotanica*. Le possibilità di questo tipo di analisi vengono evidenziate, così come l'esigenza di ampliare il concetto stesso di etnobotanica, includendo nel suo campo i sistemi naturalistico-terapeutici del passato e dando vita così all'*Etnobotanica storica* o, ancora meglio, all'*Etnobotanica storico-cognitiva*.

Key words: Ancient botany, Anthropology, Dioscorides, Ethnobotany, Ethnology, Ethnoscience, Materia medica.

INTRODUCTION

Although the practice of what is currently called *ethnobotany* probably dates back to the discovery of the New World by Christopher Columbus (ca. 1446/51 - 1506), with the observation of the use, by local people, of natural substances (among others, plants) with physiological effects, the word *ethnobotany* is recent: it was created in 1895 by Harshberger and referred to *the use of plants by aboriginal peoples* (HARSHBERGER, 1896).

Since then, there has not been an agreement on the definition of the field of *ethnobotany* and, hence, on the aims and methods of the discipline. Nevertheless, it is widely admitted that the object of the enquiry are the *traditional cultures* (COTTON, 1996: 1-18), which are generally

not better defined and probably have to be considered as the non Western ones. Consequently, the practice of *ethnobotany* consists mainly in recording and analysing contemporary botanical knowledge of such cultures, in various ways which have not to be determined more precisely here, above all in order to study their management of several sectors of traditional economy, i. e., of the exploitation of the resources provided by the environment (COTTON, 1996: 90-126).

This type of knowledge has recently become of particular practical interest, because of its possible exploitation in several sectors: the development of health programmes of non Western countries (IMPACT, 1984) or of new drugs by Western pharmaceutical industry from traditional uses (DELAVEAU, 1977; DELAVEAU, 1986; THE LANCET, 1994), i.e., *ethnopharmacology*, which aims to inventory the traditional therapeutic practice, to verify its efficiency and to integrate it into health policy (FARNSWORTH, 1990; COX, 1990; DOS SANTOS & FLEURENTIN, 1991; COX, 1994; FARNSWORTH, 1994); simultaneously, it began to be used in the management of the newly launched concept and policy of sustainable development and, consequently, of the conservation of biodiversity (see, for example, the *Resolution of the World Health Assembly*, 41.19, May 13 1988, point 23, in: BALICK, 1994).

While this kind of approach limits the field of *ethnobotany* to the *traditional cultures* currently observable, a broader definition of the term enlarges considerably the field of the discipline and opens new and interesting perspectives: according to it, *ethnobotany* would deal with *all the aspects of the mutual relationships between plants and traditional culture* (COTTON, 1996: 1) Even though it still refers to *traditional cultures*, this definition contains implicitly a new concept through the expression *reciprocal relationship between man and environment*: that of a system of thinking in which there is not necessarily an internal structure of Matter which Man discovers by means of what is considered to be the scientific activity; instead, the World is built by Man (his activity of discovery and management constitutes the World, in a form which may change over the time), as well as Man is determined by the World (according to the principle of adaptation to the environment).

In this context, we could consider that the *traditional cultures* are the ones in which there is not necessarily a distance between Man and Matter and, above all, no postulate of a predetermination of Matter by internal laws, the discovery of which is supposed to constitute the scientific activity. In this sense, the expression *traditional culture* has to be understood as opposed to the Western one, i. e., to the one qualified as scientific by itself, into which the paradigm of science is determined by the postulate of the presence of internal laws within Matter (CROMBIE, 1994).

This kind of approach has allowed the development of what is currently called *cognitive ethnobotany*, which aims to study the perception of the natural world of non Western cultures, through the analysis of symbolism, among others in ritual, myth and art, and, hence, to reconstruct the complex language and the theoretical systems underlying the approach of the physical world (KOHNEN, 1997), generally or specifically for a group and/or for a sector, mainly in the field of health (BANNERMAN *et al.*, 1983): therapeutics (ALBERS, 1998; BELLAKHDAR, 1997), psychiatry (LANTERNARI, 1994), paediatrics (GOTTSCHALK-BATSCHKUS & SCHULER, 1996) or, among others, gynaecology (GOTTSCHALK-BATSCHKUS *et al.*, 1997) and alimentation (SCHRÖDER *et al.*, 1996), possibly also in a transcultural and comparative perspective (GOTTSCHALK-BATSCHLUS & RATSCH, 1998).

If we admit these concepts, it appears that they could be applied to a wide range of peoples: not only the contemporary ones who do not think of the World according to Western logic, but also the Ancient ones, i. e., historical cultures, currently known only by documents of all types (archaeological, textual, linguistic and others). Consequently, it is possible to transfer *ethnoscientific* concepts and methods of study to the analysis of these documents, as we would like to show here, without limiting the perspective, however, to a possible practical application (HOLLAND, 1994) as it has already been the case, for instance, for ancient Arabic Medicine (for example: BELLAKHDAR *et al.*, 1997); instead, we would like to stress the possibility to reconstruct a theoretical system, in a way similar to that one of cognitive ethnobotany, so as to be able to propose an epistemological approach of botanical knowledge.

Concretely, we shall focus on an Ancient work of special interest in the History of Botany, the *De materia medica* of the Greek Dioscorides (1st cent. A. D.), largely recognised as the most important treatise of the Western scientific tradition in the fields of Botany and Pharmacology. We would like to show that, even though it has to be considered as one of the founding works of Western scientific thinking, it reflects, at least in part, a structuring of the World by Man, in which human values of all types have been projected on Matter, instead of being organised according to possible internal laws of Matter; consequently, it has to be seen as a document which witnesses the structuring of World by Man, and not as a proof of a pre-science, by ancient cultures, of immanent laws regulating Matter.

In order to do so, we shall divide the paper into three main parts:

1) a brief presentation of Dioscorides' biography, in order to place precisely the historical context of the work and of our analysis;
2) a synthesis of the current status of knowledge of his work, according to the bibliography; focusing above all on the question of its structure;
3) a renewed analysis of the treatise, which stresses its construction on the basis of cultural parameters. As a conclusion, we would like to propose to enlarge the concept of Ethnobotany by the use of that one of Historical Ethnobotany.

Analysis

Dioscorides' biography

Very little is known on Dioscorides' biography (Wellmann, 1903: 1131-1132; Scarborough, 1984: 65-69; Riddle, 1985: 1-14): according to his name in the manuscripts (*Dioskoridês Anazarbeus*), he was originary of Anazarba, in Cilicia, a region in the south-eastern part of Asia Minor, the main city of which was Tarsus, well known thanks to Saint Paul. On the other hand, the history of the personage to whom

Dioscorides dedicated his treatise (DIOSCORIDES, *Pref.*, § 1 & 4; SCARBOROUGH & NUTTON, 1982: 198) furnishes if not a date, at least an epoch for the completion of the work: Areios, about whom Dioscorides said that he frequented the circle of Laecanius Bassus (DIOSCORIDES, *Pref.*, § 4), known to have been a consul in Rome in 64 A. D. (SCARBOROUGH & NUTTON, 1982: 217). We may thus consider that Dioscorides completed his treatise around the years 65-70 A. D.; hence, the affirmation widely diffused in the bibliography according to which the work was written contemporarily to the *Naturalis Historia* of Pliny (23/24 - 79 A. D.) (for example: FAUSTI, 1996: 191).

On Dioscorides' life, we have no explicit information, except a brief phrase in the introduction of the treatise (DIOSCORIDES, *Pref.*, § 4), in which the author says that he travelled a great deal, because, he adds addressing to the personnage to whom he dedicated the work, «I had, as you know, a life qualified as *stratiôtikon*». This adjective has been interpreted as referring to the fact that Dioscorides was a soldier (SCARBOROUGH & NUTTON, 1982: 213-217; RIDDLE, 1985: 2-4); in this perspective, it has been considered that Dioscorides visited personally if not all the sites he mentions in his work, at least a great part (RIDDLE, 1985: 3), for the legions were accustomed to move through the Roman territory. Given the epoch which is believed to be the one of Dioscorides, it has been supposed that he was a soldier during the reign of the emperors Claudius (41 - 54 A. D.) and/or Nero (54 - 68 A. D.) (FAUSTI, 1996: 191).

This interpretation of Dioscorides' phrase and carrier is not supported, however, by the meaning of the word *stratiôtikon*: although it obviously refers to the *army* (FRISK, 1973: 2, 806, *s.v. stratos*), it does not necessarily mean an *activity as a soldier* when it is applied to the term bios/*life*, as it has been considered (SCARBOROUGH & NUTTON, 1982: 213); instead, from its morphology (BUCK & PETERSEN, 1944 : 636-671), it could be argued that it alludes to something *in the soldier's style*. In the present case, such an interpretation would mean that Dioscorides had a life similar to that of the soldiers, i. e., of hard work, possibly travelling as did the physicians in this epoch (NUTTON, 1973).

The affirmation according to which Dioscorides was a soldier or a physician of the Roman legions has thus to be handled with great caution. Consequently, his dates in relation to the troops of the Emperors Claudius and Nero are no more valid, even though Dioscorides probably lived around the same years; but the proof is another one: when Dioscorides addressed to Areios in the *Preface* of the treatise (DIOSCORIDES, *Pref.*, § 4), he said, first, that he wrote the work on his invitation and, second, that he did so after a lifelong interest for Botany. Yet, when Dioscorides alluded to Areios, he quoted also Laecanius Bassus because they were in close contact, as he explicitly said. It is thus probable that Areios protected Dioscorides precisely because he himself was a member of the circle of Laecanius Bassus. Now, the period when Bassus was in a Roman province dates after 64 A. D., as we have seen. This is thus the epoch when Dioscorides completed the writing of his treatise and, as told by himself, when he was elderly.

On the other hand, it seems to be sure that Dioscorides frequented another circle of the Roman power in the oriental provinces or, at least, another member of the circle of Laecanius Bassus. In the Greek manuscripts, indeed, he is called *Dioskoridês Anazarbeus Pedanios* and he is believed to have received the Roman citizenship, in an epoch in which this was still a privilege limited mainly to the Italian population. From the legal point of view, this happened by means of a fictitious adoption: the beneficiary was *adopted* by a member of a Roman family – that of the *Pedanii* for Dioscorides – and took the name of his *gens* - i. e., of his family; hence the adjective *Pedanius* added to Dioscorides' name, in order to form a true Roman name, with three constituents. If this interpretation were correct, it would mean that Dioscorides was in contact with the *gens Pedania*, members of which are known to have played a certain role in the Roman and provincial administration from 43 to 60 A. D. (SCARBOROUGH & NUTTON, 1982: 197-198).

This is all that can be said on the basis of the explicit information in our possession on Dioscorides' life. Besides this, it can be argued from an internal analysis of the treatise that its author was probably, if not a physician who practised medicine, or a root-cutter and a merchant who

gathered and sold medicinal plants and other therapeutic substances as it has been sustained (RIDDLE, 1985: 4-11), at least a man interested in these matters, as he himself affirms in the introduction of the work (DIOSCORIDES, *Pref.*, § 4), although this kind of declaration is typical in prefatory letters.

Current status of knowledge of the De materia medica

The treatise, written in Greek, is currently known through the critical edition published at the beginning of the 20th cent. (WELLMANN, 1906-1914). It is entitled *Peri ulês iatrikês*, i. e., exactly *De materia medica*; it is to say: on the matter used for the preparation of therapeutics. This matter was of vegetal, mineral and animal origin, and is constituted, in Dioscorides' treatise, by no less than 827 items to which corresponds the same number of chapters. For each matter, the chapter is mainly divided into three parts (RIDDLE, 1985: 25-93):

a) name (with possible synonyms) and physical description of the natural element from which the drug came. In the case of vegetal drugs, this was the plant itself. In the cases when it was well known, it was not described, as Dioscorides himself stated (see, e. g. DIOSCORIDES, *De materia medica*, I, 86: the papyrus; I, 99: the rose). For the drugs of animal and mineral origin this description is normally absent.
b) specification of the drug itself, with, possibly, its preparation, state and ways of conservation, followed by its therapeutic properties (expressed by the Greek word *dunamis*; cfr. SCARBOROUGH & NUTTON, 1982: 199-202) and medical indications (with specification of the other ingredients, excipients, modes of preparation and administration of the drugs).
c) related information, such as veterinary and cosmetic uses; toxicity; handicraft; superstitions, and similar.

Before going further, it must be stressed that, in matter of translations of the treatise into modern languages, only the German one (BERENDES, 1902) has been prepared on the basis of a modern critical

edition (SPRENGEL, 1829, 1830), even though this one is insufficiently critical (TOUWAIDE, 1995) and was superseded by that of Wellmann, published shortly after the translation by Berendes. All the other translations at our disposal (English, Italian, Spanish, French and, even, Czech) were prepared on versions of the text which are far from reliable: the English one (GUNTHER, 1933), the Italian (MATTIOLI, 1544; see: FERRI, 1997) and Spanish (DE LAGUNA, 1555; see: ALBARRACIN, 1983) ones on Renaissance editions of the Greek text; the French ones (MATHEE, 1559; DU PINET, 1561; see: TOUWAIDE, 1984) and the Czech ones (MATTHIOLA, 1562; see: LENZI, 1997) on another version (precisely, the Latin one by Pietro Andrea Mattioli, which, in its turn, was a version of the Italian translation by the same author). Consequently, none of these versions is reliable for an exact perception of Dioscorides' text.

The study of the treatise, lavish during the Renaissance (RIDDLE, 1980), is currently restricted to a limited circle of specialists, above all hellenists, mainly because of the difficulty of its language, with many specialised lexical fields: phytonymy, botany, zoology and mineralogy; pharmacology, pathology and pharmacy, without speaking of all the related ones, as cosmetic or veterinary medicine, for example.

In the perspective of the present paper, we would like to stress the work done on the question of the structure of the treatise. In the manuscripts, its text is divided into five books, the constitution of which is generally believed (from WELLMANN, 1903: 1132, to, more recently, STANNARD, 1969: 60) to be original and to result from an organic division of the matter, which would be the following:

Book 1: aromatic substances, oils of vegetable origin, trees and fruits;
Book 2: drugs of animal origin, cereals, and herbs of bitter and acid taste;
Book 3: herbs and roots;
Book 4: herbs and roots;
Book 5: wines and drugs of mineral origin.

A recent work has questioned this view (RIDDLE, 1985: 94-131): according to it, the way of grouping the matters within the treatise

would refer to the physiological effects of the drugs; i. e., drugs with similar effects and, thus, with similar properties and, finally, with similar active principles have been grouped. Consequently, the structure would witness an exact perception of the activity of drugs and would also allow us to trace a pre-science of modern phyto- and pharmacochemistry.

A renewed analysis

From a fresh study of the work in its Greek text, it appears that, on the question of the structure of the work, it is necessary to distinguish two levels: a microscopic and a macroscopic one; the first deals with the sequence of chapters so as to form groups, and the second with the sequence of the groups.

a) Microscopic structure

As for the groups of chapters within the *De materia medica*, we must first bring their existence to light. From a complete index of the Greek lexicon used in the *De materia medica*, it appears that several semantic notions (dealing, for example, with therapeutic properties, organoleptic qualities of the drugs or similar) do not appear equally within the treatise. For example, the notion of warm appears mainly at the beginning of the treatise (I, 1-28), while that of astringent appears only later (I, 69-106), that of bitter mainly in book 3 (3, 22-47) and that of cold in book 4 (4, 1-17). From a closer examination, it appears that the groups are defined not only by means of their properties, but also by their use, their morphological structure or their botanical type: plants used against venom (3, 90-113), plants which produce a gum (3, 81-89) or umbellifer (3, 48-80). This allows us not only to state the presence of these groups, but also to affirm that the criteria used to define them were not homogeneous.

In the groups constituted on the basis of the properties, the presence of other properties seems to contradict this first statement. But, from a deeper analysis, it appears that these apparently heterogeneous properties occur, first, progressively within the groups (when they start,

they are few and increase step by step) and, secondly, abruptly within a group.

These statements must be analysed separately. As for the second one, the chapters where occur differences of this type, frequently deal with plants with names so similar that they could give rise to a confusion. This is the case, for example, of the plants called *arktion* (DIOSCORIDES, 4, 105) and *arkion* (DIOSCORIDES, 4, 106), traditionally identified respectively as *Celsia orientalis* L., *C. acaulis* Bory and others, and *Arctium lappa* L. (ANDRE, 1985: 23, *s. v. arction* and *arcion 1*, contrarily to STIRLING, 1995: 77, *s. v. arctium* and *arcion*), and credited with the following therapeutical actions:

arktion	toothaches - burns - sciatica - dysuria
arkion	spit of blood - internal pus - wrenching of articulations - wounds

Although their indications are different, the plants appear consecutively. The reason has surely to be sought in the similarity of their name which could provoke a confusion. In doing so, Dioscorides probably wanted to call the attention on the fact that, although they had similar names, they had different therapeutic actions.

The problem is more complex however, because the indications of the first one (*arktion*) do not correspond to those of the group where it appears (DIOSCORIDES, 4, 85-127), characterised by an astringent action due to the cold. Now, we note that, in the description of the plant, Dioscorides mentioned that, like the previous (4, 104: *aithiopis*, identified with *Salvia aethiopis* L. and *S. argentea* L. by ANDRE, 1985: 7, *s. v. aethiopis 1*; and with *S. aethiopis* L. by STIRLING, 1995: 21, *s. v. aethiopis*) it is similar to *phlomos*, which is described in the previous chapter (4, 103; identified with *Verbascum* spp.; ANDRE, 1985: 197, *s. v. phlomos*). This invites us to consider that Dioscorides constituted chains of matters, related between them by one or another element: for *arktion* and *arkion*, it was the similarity of the name, and, for *arktion* and *aithiopis*, their morphological similarity with the previous, *phlomos*. The constitution of these

chains provoked a rupture in the homogeneity of the group from the point of view of the properties and, consequently, of the indications: while *phlomos* is considered to be astringent, *aithiopis* is credited with an action on sciatica, pleurisy, spit of blood and roughness of the trachea.

This way of classifying the chapters, which doesn't constitute a unique case, results from a practical principle: the grouping of plants similar from the botanical point of view, but different from that one of their action, as well as plants with similar names, but possibly different from the botanical point of view and, consequently, also from that of their indications. This demonstrates that the treatise was not necessarily conceived by his author as an encyclopaedia of knowledge in the field at this epoch, as it has been stated, but could have been devoted to practical use. Further analysis will confirm this point and guide us in our interpretation of the structure of the work.
Concerning the progressive appearance of heterogeneous properties within the groups, we may quote the following sequence of chapters where appear the following properties and/or actions:

1, 11 warming, provoking urine
1, 13 warming, provoking urine, drying, astringent
1, 14 warming, provoking urine
1, 15 warming, astringent, drying
1, 16 warming, provoking urine
1, 17 warming
1, 18 provoking urine
1, 19 extremely warming
1, 20 warming with some astringency
1, 21 astringent

On the other hand, it must be underlined that, within the groups, the first item presenting the property common in the group, presents it almost always alone, with no other additive property, while the following chapters add progressively more and more properties, they themselves progressively more and more different.

If we bear in mind that the treatise could have been used for practical purposes, this suggests that, within the groups, there is a progressive differentiation of the main property. In other words: the groups gather drugs with the same main property, which is that of the first item of the group. Consequently, this item has to be considered as the representative of this property, which it fully realises. Simultaneously, within the groups, there is a progressive differentiation of this property, by an attenuation of its strength or by addition of other secondary properties, so as to have not only a single property, but a wide spectrum of differentiated properties; and these ones are progressively more and more different in a way which allows not only to classify easily the drugs, but also to identify quite easily the one corresponding to what is required for the treatment of a pathology.

Therefore, the constitution of the groups and their internal structuring results from the properties and therapeutic actions attributed to the drugs, they themselves classified according to a logic which is highly practical. Once this is admitted, we have to ask on the question of the classification of the groups.

b) Macroscopic structure

On this point, we have to question, first, the division of the *De materia medica* itself. In the manuscripts, it is constituted of five books. From a closer examination, it appears that all the books have more or less the same length, as it has been noted for a long time (BIRT, 1882: 332). From the history of book, it appears that this fact results from the support and the material presentation of book in Antiquity: it was made of papyrus and was constituted of leaves attached so as to constitute rolls; this imposed a maximum length for a work (that of the roll) or, if it was not possible to contain a work within the limits of the roll, the work was divided into two or more rolls, generally of equal length (BLANCK, 1992: 85-86), corresponding to our modern *volumes* of the same work. In this case, the division of the *De materia medica* into five books probably results from this fact. Consequently, the idea diffused in the bibliography according to which the books correspond to an internal and organic division of the matter wouldn't be right.

The presence of a separate title in each book, as well as of an introduction which specifies the contents of each one of the books will seem to contradict this view. But, it must be mentioned that papyrus rolls had an external label, attached with a string, where the contents of each roll was written, so as to allow to identify quite easily its contents, without opening them. This way of doing was even more necessary when a work was divided into several rolls.

Now, when ancient book passed from papyrus to parchment and, in the same time, from the roll to what is called the *codex* (i. e., the book composed of quires bound together), the contents of these labels have been maintained at the beginning of the text of a single work or at the beginning of the text of each one of the divisions of the same work, i. e., of the rolls. Over time, this species of summaries could very well have been transformed into introductions artificially integrated into the text as if they were original, with addition of a separate title for each one of the parts of the text, i. e., the text contained in a roll of papyrus. In this way, the ancient volumes of the same work were transformed into books.

Consequently, the *De materia medica* wasn't probably divided according to internal divisions of the matter, but constituted a large *continuum* of no less than 827 chapters or, as we have shown before, of a certain number of groups of drugs with quite unitary properties. The problem we have to cope with now, is that of the order in which these groups have been presented by Dioscorides.

On this point, the author affirms explicitly that he chose a system different from that of his predecessors (DIOSCORIDES, *Pref.*, § 5), without specifying, however, which one. But, from the criticism he addressed to previous writers (DIOSCORIDES, *Pref.*, § 3), one thing is sure: the order he adopted is not the alphabetic one.

From a closer examination of the text in its original Greek version, it appears that the first and the last chapters of the work are opposed: not from a pharmacological point of view, but from that one of the properties, qualities and values ascribed to the materia medica they deal with, the iris for the first one (1, 1; identified with *Iris florentina* L., *I. germanica* L. and *I. pallida* Lamk., in ANDRE, 1985: 133, *s. v. iris 1*)

and *the black with which we write*, i. e., black-lamp, used to produce ink for the other one (5, 162). They are opposed, in fact, from all points of view, as it can be seen from the table here under:

	Iris	*Black for the ink*
Colour	Multiple	Black, i. e., none
Organoleptic qualities:		
Odour	Perfumed	Scentless
Touch	Dry	Moisten
Temperature	Hot	Cold
Weight	Light	Heavy
Dynamic	Ascendant	Descendant
Linked with	The gods	Subterranean world
Ritual uses	Religion	Magic

All these properties are not casual, but result from the physics of the Ancient World, governed by a system of anthropomorphisation of matter, i. e., the attribution of properties resulting from a subjective perception of the World: as affirmed by Dioscorides, the iris can have several colours; as such, it is positively connoted, all the more because it is perfumed; given the analysis of perfume made in Antiquity, it is hot and, consequently, dry, by elimination of the possible moisture; for this reason, it is light, just like its perfume, which, on its turn, is ascendant; as such, it was offered to the gods in the sacrifices. Black-lamp, used to produce ink, is defined by an opposition on all these points, so that we can consider that the whole *De materia medica* opens and concludes on opposite points.

Once we have seen it, we discover that the groups of properties are organised according to the same logic as that present within the groups, i. e., a progressive loss of the positiveness, whatever it is. Indeed, the first group, that of the *arômatika*, viz. perfumed plants is that of the warm matters (1, 1-28); it is followed by that of the oils (1, 30-42) and that of the perfumes (1, 43-63), both globally considered as warm, as well as the group of the gums (1, 64-68). After that, comes the group

of the trees (1, 69-106), the main quality of which is astringency. This property will probably seem strange after warmth. There is, however, a link between this group and the previous ones, which is double; first, astringency provoked the same result as warmth: a higher density of physiological tissues; the process itself is different: warmth acts by eliminating moisture and contracting thus the substance itself, while astringency only contracts it. Secondly, the link between trees, aromatic and/or perfumed substances lies in their subjective valorisation. A confirmation of that results from the fact that the following group is that one of the fruits (1, 106-129), obviously credited with a positive value. Their property is linked with that of the trees, given that they are considered to be astringent, but differ also from those ones, at least in part, because they are bad for the stomach.

After the vegetal which we could qualify of superior, comes the animal life. Strangely enough, its group (2, 1-84) starts with marine animals and not, for example, with an animal product as honey, which, instead, closes the group, along with wax (2, 82-84). The contradiction is only apparent: water is linked with the digestion and, as such, is positively connoted.

The following main category is that of the cereals (2, 85-102). Although they are positively connoted (they are linked with the goddess Dêmêtêr), they are less noble, however, than animal matters, because they require to be transformed, i. e., to be worked, in order to be consumed. This dimension explains why honey is at the end of the animal matters: just like cereals, it has to be elaborated before being absorbed and just like cereals it was linked with Dêmêtêr as well.

It is not possible to inventory here all the groups of the treatise, their qualities and the links between them. These few examples show well enough the way of classifying the groups: they are arranged according to criteria of valorisation, between a positively connoted and a negatively connoted point, so as to form a sort of descendant hierarchy; in other words: there is, within the work, a true scale of the groups, the steps of which correspond to the valorisations attributed to each of them.

This statement changes the idea that the treatise is limited by a positive point and its opposite: in fact, it is organised as an axis, in a way which reminds the *Great Chain of Being* of A. O. LOVEJOY (1936). On this axis, the chapters are distributed from the positive to the negative, in a descendant order, determined not by objective properties, but by the subjective qualities attributed to Matter from a multitude of parameters, as we have seen in the examples we have given.

The heterogeneity of these parameters doesn't constitute an argument against the existence of this structure. It demonstrates that the system of thinking underlying this classification is not a scientific one (in the Western meaning of the word), but a traditional one (or: an archaic or a pre-scientific), in which the principle of no-contradiction doesn't exist; instead, the World is analysed from a multitude of points of view which are less contradictory than complementary, even if they could seem to be opposed on certain points of the construction. But this is one of the main characteristics of pre-scientific thinking, if not its main characteristic, the fact that it changes points of view without true contradiction; on the contrary, there is a superposition, so as to obtain an exhaustive analysis of reality, even though the parameters used are heterogeneous.

The fact that the parameters used are heterogeneous and that they can be assembled in various ways reveals that the reading of reality they constitute was of cultural, i. e., of ethnological nature. In other words: the selection of the parameters used to decipher the World, the construction into which they are assembled and the result of their application to Matter are different for each group of peoples and reveal its way of projecting itself on the World.

The problem we are faced with now is that of the use of such a system. Yet, the properties attributed to the groups of matters implied their therapeutic use: warmth was indicated for eliminating the excesses of moisture, just like moisture had to be administered to counterbalance excessive warmth. Yet, excessive moisture was typical, in the Ancient pathological system, of gynaecological pathologies, while warmth was mainly due to the boiling of the physiological humours; due to the ascendant force of warmth, the humours raised from the

inner part of the body to its upper, viz. external part, and provoked, consequently, dermatological affections. Warm drugs had thus to be used for the treatment of the pathologies of the female organs of reproduction, while the cold ones were indicated for the treatment of dermatological pathologies. And indeed, if we consider the Greek index of the text, we note that its items dealing with gynaecological and dermatological pathologies appear in strict parallelism with those dealing with the concepts of warm and cold, respectively: the majority of the occurrences of words signifying warm and dry appears contemporaneously with the majority of the occurrences of the words dealing with gynaecological pathologies, and it happens the same for the items related to the notions of cold and of dermatological pathologies.

When a physician wanted to consult the *De materia medica* for the treatment of a pathology, he knew, from his diagnosis, which type of therapeutic agent was required, i. e., which property was necessary. Indeed, the general principle of the treatment was that of the contraries. In this context, the diagnosis consisted in identifying not only a pathology as a theoretical entity, but also a mechanism, the action of which provoked the pathology. Consequently, to treat this pathology, the physician had to administer a substance able to restore the normal function of the body. At the end of the consultation, the physician postulated a theoretical action to be administered to the patient in order to counterbalance the activity of the pathological cause. In other words, the physician had to search where the action required was located on the scale of the groups of therapeutic matters within the *De materia medica*.

Given that the scale of ordering the groups was of cultural nature and belonged thus to the group of which he was a member, the physician was able to identify easily the structure of the treatise and the point where the required property was located. Having identified this group, he had to choose a drug, according to several parameters: possibly, a grade of activity and also the presence of other properties (related or not), i. e., the differentiation of drug activities within the groups. The physician had only to read the matters of the group, starting from the first, because of the principle of progressive differentiation.

But there was another factor which played an important role: the availability of the drugs required, according to the place, the season or, possibly also, the drug trade. This also may justify, at least in part, the existence of groups with several matters credited with the same property or, if not exactly the same, very similar: when the drug required was not available, the physician might use those with similar activity.

The presence of a hierarchical system of classification of the drugs within the treatise may result from another type of thinking and, simultaneously, introduce another theoretical concept in the field of therapeutics. The fact that the first group of drugs are the warm ones and that the first item of this group is the iris brings to remind, indeed, a definition of therapeutics which was common during Antiquity: that one according to which *the pharmaka were the hands of the gods* (VON STADEN, 1989).

This concept is implicitly alluded to in Dioscorides' treatise in the chapter devoted to iris. In Ancient Greek, in fact, the word *iris* meant not only the *plant*, but also the *rainbow*, since both presented all the colours of the spectrum, as Dioscorides told explicitly (1, 1). Now, in Greek mythology, the rainbow was not only the atmospheric phenomenon, but also a godliness: the Messenger of the gods who brought the messages of the supernatural beings to the human ones and, as such, was a bridge between celestial and terrestrial world, just like the rainbow. This concept is exactly that of the *pharmaka* which are *the hands of the gods*, in a very literary and subtle allusion.

In this way, Dioscorides introduced into his work a true *theology* of *pharmakon*, for he explained the creation of therapeutics by means of the care of the gods for the Humanity. But, at the same time, he created also a *phenomenology* of therapeutics, because he linked the creation of therapeutic agents with the history of the gods themselves and, through them, with the history of the World. The sequence of the groups we have presented corresponds, in fact, to the Cosmogony: first appeared the gods, who were linked with perfume and with Nature, without being obliged to work; instead, they only had to grasp fruits from the trees; after them, came the animal and human life, characterised by work: the one necessary to transform cereals into bread, as

well as that needed to work metals. Finally, wine, described in the first part of book 5 of *De materia medica*, was brought in a recent time by Dionysios.

This phenomenology not only aimed to introduce a history into the field; it allowed also to explain the properties of the therapeutic substances (they result from the qualities or the action of the god who created them) and to justify their properties, from a moral point of view. In this perspective, perfume, for example, was linked with divine life and, consequently, used in the care of gynaecology, i. e., of the creation of life; the trees, the fruits of which were eaten by the gods, contributed to health and were, thus, *good for the stomach*, just like the cereals, linked with Dêmêtêr.

In this way, the presentation, grouping and classification of the drugs according to their subjective, viz. cultural valorisations used by Dioscorides allowed him to present a system which was not only coherent, but also complete, from the theoretical as well as from the practical points of view. It expressed a general conception of the World, and not only of therapeutics, which was global and resulted from a projection of Man's Mind on Matter and from the determination of Man by Matter.

Conclusions

We hope to have shown that the structure of Dioscorides' *De materia medica* is by far more complex than what was affirmed in the bibliography and that it results from the association of two types of criteria: the practical usefulness of the treatise and the cultural organisation of Matter by a determined group, Ancient Greek people.

Simultaneously, we hope to have succeeded in stressing that it is possible, if not desirable, to introduce in the reading of the work the concept of *ethnoscience*, i. e., that of an interrelation between Man and World. In other words: to be read adequately, Dioscorides' treatise has to be considered not as a first approach of modern phytochemistry, but rather as a witness of a system of thinking in which Man projects him-

self on the World, in this case on Botany, probably adapting also himself to the World.

Consequently, it seems to us that the *ethnobotanical* approach may in no way be limited to the study of contemporary traditional cultures, but can be transferred without restriction to Ancient non- or pre-scientific cultures, currently known only through documents, among others textual like Dioscorides' *De materia medica*. In this perspective, given that it is not possible to integrate ancient practice into modern for a wide range of reasons, starting from the uncertainty of the identification of the plants quoted in the text with modern species, the enquiry has to deal only with the reconstruction of the theoretical system underlying the documents, i. e., what has been called *Cognitive Ethnobotany*; in this case, we should probably speak of *Historical Cognitive Ethnobotany* or, at least, of *Historical Ethnobotany*.

Acknowledgements. This paper has been prepared within the research project PB 97-1125 supported by the Dirección General de Enseñanza Superior y Investigación Científica of Spain. I wish to express my gratitude to Dr. Mónica Quijada, Director of the project, who associated me to the project, as well as Prof. Aldo Moretti, editor of DELPINOA, who invited me to submit the article to the Journal. Special thanks go to the anonymous reviewer who carefully revised the text and improved the linguistic aspects. Any remaining errors are of course my own.

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Summary

This paper deals with the Classical Greek treatise considered to have been the most important in the Western Medical Botany till the beginning of the 19th cent., the *De materia medica* by Dioscorides of Anazarba (1st cent. A. D.). After a brief biography of its author and the status of current research on the topic, it proposes a lecture of the work of *ethnobotanic* kind. In doing so, it stresses not only the possibility of such an analysis, but also the necessity to enlarge the concept itself of *Ethnobotany*: instead of dealing only or mainly with contemporary traditional cultures, it should also include ancient cultures. Such a study would give rise to what should be called *Historical Ethnobotany* or, probably better, *Historical Cognitive Ethnobotany*.

Finito di stampare nel Dicembre 2000