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TRADITIONAL PHARMACY OF BENEDICTINE ORDER: FROM FORESTS TO HUMAN HEALTH

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Abstract

The Benedictine monks have played a fundamental role in Italian and indeed western European culture by the transmitting and spreading of botanical and pharmaceutical culture since the Middle Ages. The monasteries not only represented places of knowledge and learning which favoured the conservation of works dating back to Greek and Roman times, but were also centres where the very activity carried out influenced the characterisation of both the culture and the landscape of entire territories.

The Benedictine tradition of using vegetables or silvicolous produce in the production of medicines or other preparations for the enhancement of wellbeing has been handed down over the centuries thanks to manuscripts and books, some of which are today conserved in monasteries, the others having become part of the wealth of the more important public and private library collections. Nowadays it is possible to reread these works and appreciate their historical, cultural and scientific value. It would therefore appear to be clear that certain pharmaceutical products which have been handed down over the centuries take on a holistic value.

Introduction

From the fall of Western Roman Empire until the establishment of a new feudal regime, Italy and indeed much of Europe was marked by a serious crisis, involving not only political and institutional fields but also the whole social economic and cultural sphere. In a period dominated by the increasing disinte-

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gration of the Roman settlements, the collapse of the codified relationships between town and countryside and the resulting management of the territory, an element of cohesion was undoubtedly provided by the Church and monastic orders which, besides representing a connecting fabric in social matters, also took on the role of custodians of the cultural heritage passed down by the Greeks and Romans. During the preceding centuries, indeed, vast skill had been acquired in "controlling" nature and managing natural resources in harmony with environmental and climatic conditions but now under pressure from the nomadic populations this expertise was almost entirely lost (Cardini and Miglio 2002). Thanks to the presence of amanuenses, abbeys turned into centres where texts on various subjects, which otherwise would have been lost[1], were copied, preserved and distributed, thus guaranteeing the safety and passing down of expertise and know-how regarding, amongst other things, the management of water, the cycles of the seasons, the preservation of the soil, the growth of plants, the production of flowers and fruit including the practical use to which they were put, namely medicine.

The uncertain political situation typical of that era confined the birth of monastic centres largely to the internal areas of the country where greater care could be devoted to religious observance and spiritual practices. For this reason centres for monastic gatherings spread for the most part, initially at least, throughout the centre and south of Italy, mainly in hilly or mountainous areas, in the proximity, therefore, of a vast woodland heritage.

In 529, Saint Benedict built the abbey at Montecassino, in a mountainous area ascending to the sky, at that time completely surrounded by woods. It was here that he laid down the *Regula Benedicti*[2] which constituted the birth of western monasticism but also contributed towards the bringing about of one of the first chapters in European history on medicine and the care of the sick. Almost contemporary is the Vivarium monastery in Calabria founded by Cassiodoro[3].

These were models also for the future medieval monasteries, one of the

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1. Claustrum sine armario est quasi castrum sine armamentario is an ancient monastic motto thanks to which important libraries were founded in the abbeys.
2. The contents of the Rule can be consulted with ease at:
   http://sanvincenzo.silvestrini.org/regola/rsb_it.htm,
   http://www.columbia.edu/acis/ets/seminar/benevent.html,
   http://www.osb.hu/lelki/regula/l_regula/l_regula.html
3. Information on the story and the works of Cassiodoro is available at:
   http://www.cassiodoro.it/index.htm

reasons being their situation in territories which were rich in natural resources and woodlands[4]. In every successive century throughout the whole of the initial part of the early Middle Ages, the monastic centres were founded mainly on the greener territories in Italy almost as if to confirm an unbreachable bond forged between spiritual health, physical wellbeing and nature itself.

The land chosen for the monastery became a kind of "promised land" to be transformed and humanised, the senses being compelled by some magical force, a spell, emanating from the landscape which provided a background of contemplation for mystical exaltation. In the words of Fallani (1975) "The forest is capable of providing more than mere practical use, it involves a development of the concepts of the life of the soul....Mystical theology and the frequent examples of allegories are born out of a language which the monk, observing and listening to nature, has at his disposition."

Importance and diffusion of the Benedictines in Italy in relation to medical, pharmaceutical and botanical cultural

As well as representing an example for the Church through his Rule[5], St. Benedict also became a reference point as regards the care of the sick. "The infirm must be given all necessary care without hesitation"[6] and this care was to be carried out by the *infirmarius*, a fellow member of the brotherhood who rendered both religious and medical cum apothecary services to the sick. It was, then, a first example of a holistic approach towards illness and the psychological support given to the sick person was by no means insignificant. (Mazzucotelli, 1999). An example of this approach and of the importance apportioned to the patient is evident also from the project for the monastery of St Gallen, drawn up between 820 and 830, which provided for premises to be set aside for specialist care of the sick. These premises consisted of a number of rooms dedicated to the care of the ill themselves as well as to the administration and the storage of medicines and also included a set of equipment aimed at providing comfort and hygiene, such as baths and heating systems which at the time, without a shadow of doubt, were absolutely innovative concepts. (Frohn, 2004).

Thanks to the birth of the Benedictine order, to the Rule and recognition

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4. At Vivarium Cassiodoro instituted a scriptorium for the collecting and reproducing of manuscripts.
5. Chapter 36 of the Rule of Saint Benedict is entirely given over to the care of sick brothers.
6. Infirmorum cura ante omnia et super omnia adhibenda est.

even on the part of the political powers[7], the abbeys and monasteries blossomed forth into a period of great cultural development which guaranteed a widening of the knowledge of the various sectors of medicine, apothecary skills, and botany. The classical sources used were those coming from Greek and Roman culture. Cassiodoro already recommended the reading of Dioscorid's De *materia medica* (Πεδάνιος Διοσκουρίδης)[8], which he translated into Latin, as well as the works of Claudius Galenus (Κλαύδιος -Γαληνός)[9] and Pliny the

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7. Charlemagne conceded numerous privileges to the Montecassino abbey and perceived in Saint Benedict's work a useful element for the uniting of his empire.
8. Pedacio Dioscorid (1c.AD) was a military doctor during the 1st century AD and served in the army of the Emperor Claudius. In 5 volumes he listed all the medicines known at the time. These were mainly of vegetable origin. He described what the plants looked liked and the effects caused by their use. The original Greek title was Peri hyles iatrikes/Peri haplon pharmakon" (The Medicinal Forest/The Subject of Medicine). The work was dedicated to the doctor Aerios, a friend and colleague of Dioscorid's. It includes medicinal compounds from all three natural kingdom's, namely the animal (including man) the vegetable and the mineral kingdom. It is the vegetable kingdom which boasts most entries with the listing of as many as eight hundred and thirteen medicinal plants while the products of animal origin amount to one hundred and one and those of mineral derivation one hundred and two. The total then amounts to around 1000 substances, to be administered in 4740 different therapeutic cases.
   A chapter is dedicated to each medicinal compound and is systematically subdivided. Vegetables are generally divided into seven paragraphs:
   1) the name of the plant and its synonym used in various other countries. 2) distribution of the plant 3) very precise description (In order to avoid errors due to the particularities of individual samples Dioscorid does not include illustrations) 4) effects and properties 5) indications concerning preparation (recipe for making up the preparation) 6) indications for the verification of the authenticity of the compounds, their purity and quality 7) indications concerning the gathering, preservation and transformation of the plants and the equipment to be used.
   The work is divided into five volumes, covering respectively: 1) essences, oils, trees and their juices and fruits, ointments. 2) produce from land living animals (fats and milk) and from marine animals. Cereals, vegetables, aromatic plants and herbs (including garlic) are also covered. 3) roots and their watery extracts as well as seeds and pips 4. Further plants not covered in the previous volumes; mushrooms 5) vines and the beneficial effects of various wines; metals and salts.
   For further information consult: http://www.amo-bulbi.it/ad_biogr_juliana_anicia_dioscorids.htm, http://www.tiscalinet.ch/materiamedica/
9. Born Pergamo 129 AD.

Elder[10]. The Benedictines soon became the holders of medical knowledge and skill in the gathering and transformation of plants used for medicinal purposes. Various abbots served as personal doctors to Italy's rulers in the early Middle Ages and indeed the medical school at Salerno, the first public institution for the training of doctors, initially based itself on the contributions of the Benedictines (Mazzucotelli, 1999).

At this time a large number of prescriptions were vegetable compounds based principally on classical sources of Greek and Roman origin. This knowledge very soon became tinged with Arab influences, due mainly to Constantine "*The African*" (1065-1087), a scholar of African origin who sojurned at the monastery in Montecassino and in Salerno. Constantine acquired his scientific knowledge through study in India and Egypt and became a monk after fleeing from Africa. During his monastic life he wrote, or perhaps it is more appropriate to say he translated into Latin various Arabic works regarding, amongst others, the properties of various plants, making an important impact on medicine in Italy, and indeed making Salerno the leading school of medical knowledge in the Christian West.

It is interesting to underline how Arab knowledge itself was clearly influenced by Greek and Roman literature. In fact numerous Arabic translations of Dioscorid can be found.

Monastic medicine and the use of plants thus developed due to the influence of other cultures. This influence prospered thanks to the spread of the use of the herbarium *(hortus siccus)* which enabled plants to be identified once they had been gathered. It is probable that the *Tacuinum sanitatis,* a collection concerning the medicinal effects of plants, also came from an Arabic translation. Over the centuries various illuminated editions of this work were produced.

Moreover, the monasteries represented a network of knowledge which favoured the exchange of ideas, including with northern central Europe where in the meantime important Benedictine centres had been founded. An example of this is the case of Hrabanus Maurus, a monk from Fulden (Germany) whose manuscript text *De rerum naturis* is conserved in the archives of the Abbey at Montecassino.[11]

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10. A functionary of the Roman Empire who lived from 23 to 79 AD. He developed a kind of encyclopedic interest which led him to compile the 37 volumes of Naturalis istoria a compilation of the knowledge of the time which also gathered together Greek and Roman scientific knowledge in the field of medicine.
11. Hrabanus Maurus, 1997. De rerum naturis. The code 132 of the Montecassino Archives, complete reproduction on CDRom, Cassino. University of Cassino. This

In the late Middle Ages great importance was enjoyed by the Benedictine congregation at Monte Oliveto in Tuscany, which made its name as a centre for the production of medicinal compounds which were prepared by the *aromatarius,* an expert in the recognition of plants which were gathered and selected and then preserved by him in the *armario pigmentorium.* These were real pharmacies or spiceries which almost since the beginning of history itself have been characteristic of monasteries. In these places the wild woodland produce was gathered together alongside those plants grown specifically for the purpose in the monastery's vegetable garden. These gardens constituted one of the central points of the monastery or the abbey. Besides having an allegoric function described by Hrabanus Maurus in book 19 of *De rerum natura* they echoed Roman productive culture and were dedicated to the steady production of those plants which it was harder to find growing wild. An iconographical representation of the *herbolarius* where these medical plants were grown can still be obtained from the plans for the construction of the Sankt Gallen monastery in Switzerland. Various monastic works are however dedicated to the description of these vegetable plots. In particular we should remember the *Hortulus* or *Liber de coltura hortorum* by Walahfrid Strabo, a 9th century monk who provides us with a description of how the space and the cultivation were organised as well as a list of plants to be grown and their relative therapeutic effects (Cardini e Miglio, op. cit.). It contains indications presumably taken from texts by Dioscorid, although they are decidedly less detailed.

Again making use of the aforementioned plans for the St Gallen Monastery it is also possible to extract the following information (Cardini and Miglio, 2002):

– the use of *Juniperus sabina* near wells as an allegoric and therapeutic plant.
– the presence of space set aside for the growing of flowers.
– three spaces set aside for the growing of plants to be used both for feeding the monastic community and treating their ailments.

Even in modern times botanical, medical and medicinal cultures often joined forces in a single field of knowledge possessed indeed by many monks belonging to the various Benedictine congregations. Cassinesi, Vallombrosani and Camaldolesi (Tuscany) have left us numerous writings referring to phytotherapy based on empirical methods rather than on real scientific methodology.

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monk is an important figure in the history of culture, as he made compilations of the works of others and thus passed down the cultural heritage of Prisciano, of Iisidoro of Seville, of Beda.

Throughout the centuries libraries in monasteries accumulated a precious store of works even by lay authors. An example of such a work was Dei *Discorsi* by *Pietro Andrea Mattioli*[12]. The author was a Sienese doctor who, in 1544, published an edited version in Italian of Dioscorid's work[13].

In the 16th century iatrochemistry was becoming more common, and consequently there was an upsurge in the use of chemical medicines. Despite this development the Benedictine spiceries continued to increase in number until the 18th century and firmly established themselves throughout the whole of Italy. Besides being centres for the making up of medicines these spicieries also became libraries containing collections of books and manuscripts pertinent to all types of knowledge concerning phytotherapy, written both by the clergy and laymen.

This knowledge, so closely bound up with nature in some of the Benedictine congregations, such as initially the Vallombrosani and later on the Camaldolesi, led to a specialisation in the field of forestry. As far back as 1350 the importance of cultivating woodland was stressed in the Vallombrosian constitution. This was an issue, however, that was to be repeatedly taken up throughout the following centuries too (Torchio and Torchio Roggero, 1972).

The 18th century saw the laicization of the pharmacies. This phenomenon was linked to factors such as:

- autonomous evolution of the pharmacies with respect to other fields of science, the increasing importance of chemistry and the consequent specialisation in formulated compounds.
- the establishment of corporations holding autonomous statutes; control by public institutions over the preparation and distribution of medicines;
- interdiction imposed on the monks both by the ecclesiastical hierarchies and the laical powers prohibiting preparation and sale of their medicinal products on a widespread scale.

In the 18th century the alienation of the ecclesiastical wealth which took place in the first instance under Napoleonic rule and later directly by the Italian government (1866) caused the almost total disappearance of the Benedictine pharmacies which however, in some sporadic cases remained intact until the 20th century.

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12. P. Andrea Mattioli (1500-1577) was one of the greatest phytographers and phytologists of the 6th century in that he united and coordinated all the knowledge concerning botanical medicine existing at the time.
13. An edition dating back to 1604 is today present in the library of the Monastery at Camaldoli.

Medicinal plants in monastic medicine

In his *armario pigmentarium* the *aromatarius* collected and arranged a significantly wide range of plants, the effectiveness of which had already been described in classical texts but which the monks themselves had themselves propagandized in their manuscripts. Particular reference was made to Dioscorid's work De *Materia medica*, numerous translations of which existed in the Middle Ages, complete with illustrations to aid recognition of the plants. There could also be frequent references to the works of Galeno and Avicenna. Numerous *Hortulus*, including that of Walahfrid Strabo, were written and distributed to all the leading monastic centres. The monasteries where medical science developed compiled what can only be described as medicinal recipe books. At the time of Charlemagne the pharmacopoeia produced at Lorsch Abbey in Germany enjoyed particular acclaim. Influence in the field of medieval medicine was also attributed to Hildegard von Bingen, the Benedictine abbess at Rupertsberg, who wrote *Physica* in which she dictated advice on the use of medicinal plants. The following is a brief list of plants commonly used in monasteries and convents.

Table I

Plant	Therapeutic effect/ailment	Bibliographical sources
Artemisia abrotanum L.	Inflammation of the gums, capillary rupture	Galeno, various monastic texts
Vitex agnus-castus L.	Sedative	Various monastic texts
Artemisia vulgaris L.	Digestive	Dioscorid, various monastic texts
Fagus selvatica L.	Antipyretic	
Fraxinus excelsior L.	Antipyretic	Dioscorid, various monastic texts
Glycyrrhiza glabra L.	Digestive, liver complaints	Dioscorid, various monastic texts
Laurus nobilis L.	Contusions, digestive	Dioscorid, various monastic texts
Matricaria camomilla L.	inflammation, pain	various monastic texts
Myrtus communis L.	Insect bites	Dioscorid, various monastic texts
Silybum mariano L.	Liver complaints	Dioscorid, various monastic texts
Hedera helix L.	Inflammation and pain	various monastic texts
Hypericum perforatum L.	Physcological problems	Pliny the Elder, Galeno,
Ilex aquifolium L.	Antipyretic	Dioscorid, various monastic texts
Pinus mugo L.	Coughs and colds	Dioscorid, various monastic texts
Populus alba L.	Antipyretic	Dioscorid, various monastic texts
Quercus robur L.	Inflammation	Pliny the Elder, various monastic texts
Salix sp.p.	Antipyretic	Dioscorid, various monastic texts
Viscum album L.	Defence of the organism	Pliny the Elder, various monastic

		texts
Verbena officinalis L.	Digestive	Pliny the Elder, various monastic texts
Valeriana officinalis L.	Sedative	Dioscorid, Pliny the Elder, various monastic texts
Thymus vulgaris L.	Digestive	Galeno, various monastic texts

Present day value of Benedictine knowledge in the appreciation of forestry resources linked to the sector of human wellbeing and health

Throughout Italy today there still exist a considerable number of active abbeys, monastries and hermitages belonging to the Bendedictine confederation. The Cassinesi, Sublacesi, Camaldolesi, Vallombrosiani, Silvestrini, Olivetani all have monastic communities scattered mainly across the centre and the south of Italy. To this list we must add the centres of two Cistercian congregations, the Trappist monasteries, the Carthusian monasteries and the female convents of the Benedictine order. Overall, despite declining vocation, Benedictine monasticism *sensu lato* is alive in around 200 centres (Monzio Compagnoni, 2000). These monastic centres are situated principally in locations where forest is more common, but, in line with a tradition established after the 13th century they can also be located in the proximity of large urban settlements.

The tradition of cultivating officinal herbs and the gathering and transformation of produce linked to forestry resources is still rich and indeed over the last few decades has been enjoying a new impetus. Table II shows some monastic centres which have started up the production and/or commercialisation of products linked to the traditions of herbology.

This mainly consists of infusions and decoctions, liqueurs, bitters, ointments, creams, soaps and other sundry articles pertinent to the field of the enhancement of wellbeing and health.

Production is traditional and has been handed down from one century to another yet the quality retains practically unaltered. In some cases (the monastery of Orte) production has been started up completely from scratch, the initial step, however, always being the retrieval of recipe books inserted inside manuscripts and books existing within the monastic community.

The production of honey[14] and other apicultural products is also very widespread. This is likewise true, however, for all kinds of traditional produce

14. In the past honey was closely linked to the administering of medicines as it made otherwise unpleasant compounds more palatable.

Table II

Monastery/abbey/hermitage	region	infusions	apiculture	syrups	liqueurs	cosmetics and wellbeing	essential oils	other
Monastery S. Maria degli Angeli at Pistoia	Tuscany	X			X			X
Monastery San Silvestro Abate at Fabriano	Marche		X				X	
Monastery San Giovanni Evangelista at Parma	Emilia Romagna	X	X	X	X	X	X	X
Monastery at Camaldoli	Tuscany	X	X.		X.	X		X
Monastery San Daniele at Abano Terme	Veneto				X	X		
Monastery of S. Caterina d'Alessandria at Cittaducale	Lazio				X			X
Monastery Santo Volto N.S.G.C. at Giulianova	Abruzzo		X					
Abbey Praglia	Veneto	X		X		X		X
Monastery of S. Cristina at Senigallia	Marche			X				
Santa Maria at Vallombrosa	Tuscany	X	X	X	X	X		X
Monastery Santa Maria delle Grazie at Orte	Lazio	X	X	X	X	X	X	X
Cistercian monastery Valserena Trappist at Guardistallo	Tuscany				X	X		

typical of rural communities (juices and concentrates made from fruit and silvicolous plants, jams etc.)

These monastic centres have in their keeping a large number of bibliographical sources on the subject of botanical knowledge, medicine and pharmacy which besides being of historical and cultural value are also potentially valuable from a scientific point of view, especially for pointing the way towards the verification of the potentiality of certain plants used in phytomedical practices.

Conclusions

In recent years historians too have been placing more and more importance on the rediscovery of the cultural value of the Middle Ages and to the work carried out at that time, through the activity of the monastic orders, to safeguard the classic texts. The monasteries represented real strongholds of knowledge and wisdom and, at least in the early years, were located in the middle of woods and forests. The monks and the monastic centres enjoyed a close relationship with the surrounding landscape: they made use of the forest's resources, modified the vegetation pattern (e.g. they diffused the cultivation of chestnut trees as a source of food), they left a real imprint on the physiognomy and the morphology of the territory. These modifications have survived throughout the centuries and are still visible today in the landscape of our hills and mountains.

A careful reading of the landscape can therefore allow us to rediscover this past of ours and appreciate the importance, not only spiritual, of the monastic orders. From this point of view, the woods, the green spaces, the artefacts and the historical and cultural heritage left by the monks can be "rediscovered". The wood is therefore not merely a space which supplies us with what we need to safeguard our bodies but also a place *(genius loci)* for a complete restoration, in holistic terms, of the human being. The trees and plants, thanks to the rediscovery of this culture, thus take on a value which is much more far reaching than any single material or product which they are able to provide. The wood therefore assumes a complex value which is typical of any single place and represents its inseparable heritage.

No less important or complex is the heritage of manuscripts and books dealing with botany and medicine; in this case, too, a rediscovery both from a scientific and a historical and cultural point of view would be opportune.

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TRATTATO
DE SEMPLICI,
PIETRE, ET PESCI MARINI,
che nascono nel lito di Venetia,
LA MAGGIOR PARTE NON
conosciuti da Teofrasto, Dioscoride, Plinio,
Galeno, & altri Scrittori.

DIVISO IN DVE LIBRI.

Nel Primo si contengono le Figure de Semplici, che nascono nel detto Lito, con le sue facoltà.
Nel Secondo le Figure di alcune Piante peregrine, Pietre, & Pesci Marini, con le sue virtù.

DI ANTONIO DONATI FARMACOPEO

ALL'INSEGNA DEL S. LIBERALE IN VENETIA.

CON LICENZA, ET PRIVILEGGIO.

IN VENETIA, M D C XXXI.

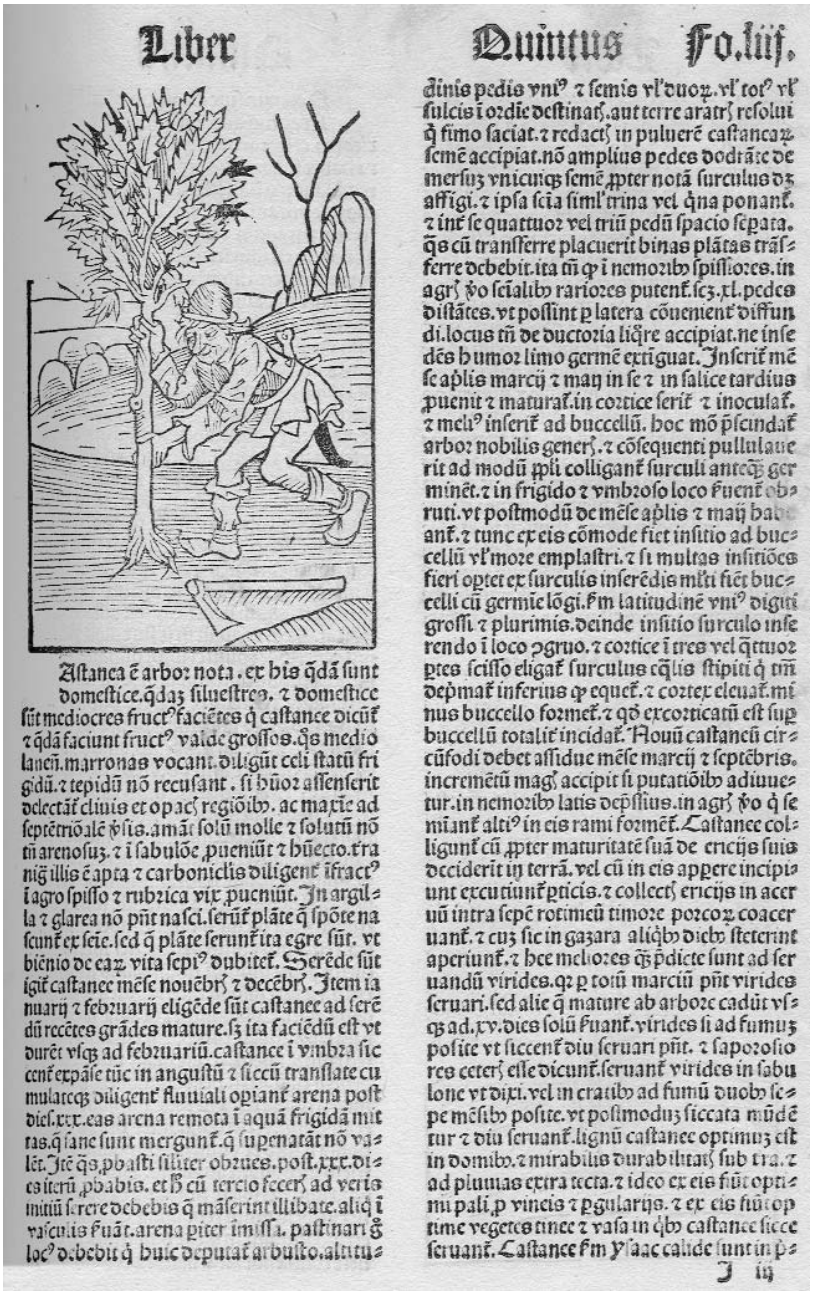
Appresso Pietro Maria Bertano.

1.

Book-cover of a Mattioli's work on Dioscorides, published in Frankfurt am Mein by Nicolai Bassaei in 1598 Picture genlty supplied by Accademia dei Gergofili Library, coll. R. 14

2.

botany table from a book of Plukenetii Amaltheum, published in London in 1705.
Picture genlty supplied by Accademia dei Gergofili Library, coll. R. 63



Liber Quintus Fo.lüj.

Astanea ē arbor: nota. et bis q̄dā sunt domestice. q̄daz siluestres. z domestice sūt mediocres fruct⁹ faciētes q̄ castanee dicūt z q̄dā faciunt fruct⁹ valde grossos. q̄s medio laneū. marronas vocant. diligūt celi statū frigidū. z tepidū nō recusant. si hūor assenserit delectāt climis et opacis regiōibz. ac maxīe ad septētriōalē ꝑtis. amāt solū molle z solutū nō tn arenosuz. z i sabulōe ꝑueniūt z būcto. tra nig̃ illis ē apta z carbonicliis diligent ifract⁹ i agro spisso z rubrica vir ꝑueniūt. In argilla z glarea nō pñt nasci. serūt plāte q̄ spōte nascunt ex scie. sed q̄ plāte seruñt ita egre sūt. vt biēnio de ea⁊ vita sepi⁹ dubitet. Serēde sūt igit castanee mēse nouēbr⁹ z decēbr⁹. Item ianuarij z februarij eligēde sūt castanee ad serēdū recētes grādes mature. sz ita faciēdū est vt durēt vsq⁊ ad februariū. castance i vmbra sicent exp̄se tūc in angustū z siccū translate cumulateq⁊ diligent fluuiali opiant arena post dies. xxx. eas arena remota i aquā frigidā mittas. q̄ sane sunt merguñt. q̄ supenatāt nō valēt. Itē q̄s ꝑabsti sūter obruce. post. xxx. dies iterū ꝑabis. et ꝑ cū tercio feceris ad veris initiū serere debebis q̄ māserint illibate. aliq̄ i vasculis fuāt. arena piter īmissa. pastinari g̃ loc⁹ debebit q̄ huic deputat arbusto. altitudinis pedis vni⁹ z semis vl' duo⁊. vl' tri⁹ vl' sulcis i ordie destinat⁹. aut terre arātr⁹ resoluti q̄ fimo saciat. z redact⁹ in puluerē castanea⁊ semē accipiat. nō amplius pedes dodrāte de mersuz vnicuiq⁊ semē ꝓpter notā surculus dz affigi. z ipsa scia siml' trina vel q̄na ponañt. z inť se quattuor vel triū pedū spacio separa. q̄s cū transserre placuerit binas plātas trāsferre debebit. ita tñ q⁹ i nemoribz spissiores. in agr⁹ vo scialibz rariores putent. scz. xl. pedes distātes. vt possint p latera cōuenient diffundi. locus tñ de ductoria liḡre accipiat. ne inf dēs humor limo germē extinguat. Inserit mē sc aplis marcij z may in se z in salice tardius puenit z maturat. in cortice serit z inoculat. z melⁱ⁹ inserit ad buccellū. hoc mō pscindat arbor nobilis gener⁹. z cōsequenti pullulauerit ad modū ꝑpli colligañt surculi anteq⁊ germinēt. z in frigido z vmbroso loco fuent obruti. vt postmodū de mēse aplis z may habeañt. z tunc ex eis cōmode fiet insitio ad buccellū vl' more emplastri. z si multas insitiōes fieri opteat ex surculis inserēdis mlti fiēt buccelli cū germie lōgi. fm latitudinē vni⁹ digiti grossi. z plurimis. deinde insitio surculo inserendo i loco ꝑgruo. z cortice i tres vel q̄ttuor ptes scisso eligat surculus cū lis stipiti q tñ depmat inferius q⁹ equet. z cortex eleuat. minus buccello formet. z qō excorticatū est sup buccellū totalit incidat. Nouū castanetū circūfodi debet assidue mēse marcij z septēbris. incremētū mag⁹ accipit si putatiōibz adiuuetur. in nemoribz latis depssius. in agr⁹ vo q̄ semiañt alti⁹ in eis rami formēt. Castanee colligunt cū ꝑpter maturitatē suā de ericijs suis decciderit in terrā. vel cū in eis appere incipiunt excutiunt pticis. z collect⁹ ericijs in acerū intra sepē rotimeū timore porco⁊ coaceruant. z cuz sic in gazara aliq̄bz diebz steterint aperiunt. z hec meliores q̄s p̄dicte sunt ad seruandū virides. q⁊ p totū marciū pñt virides seruari. sed alie q̄ mature ab arbore cadūt vsq⁊ ad. xv. dies solū seruañt. virides si ad fumuz posite vt siccent diu seruari pñt. z saporosiores ceteri esse dicunt. seruant virides in sabulone vt dixi. vel in cratibz ad fumū duobz sepe mēsibz posite. vt postmoduz siccata mūdētur z diu seruant. lignū castanee optimuz est in domibz. z mirabilius durabilitat⁹ sub tra. z ad plumas extra tecta. z ideo ex eis fūt optimi pali. p vineis z pgularys. z ex eis fūt optime vegetes tinee z vasa in q̄bz castanee siccē seruant. Castance fm ysaac calide sunt in ꝑ

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3.

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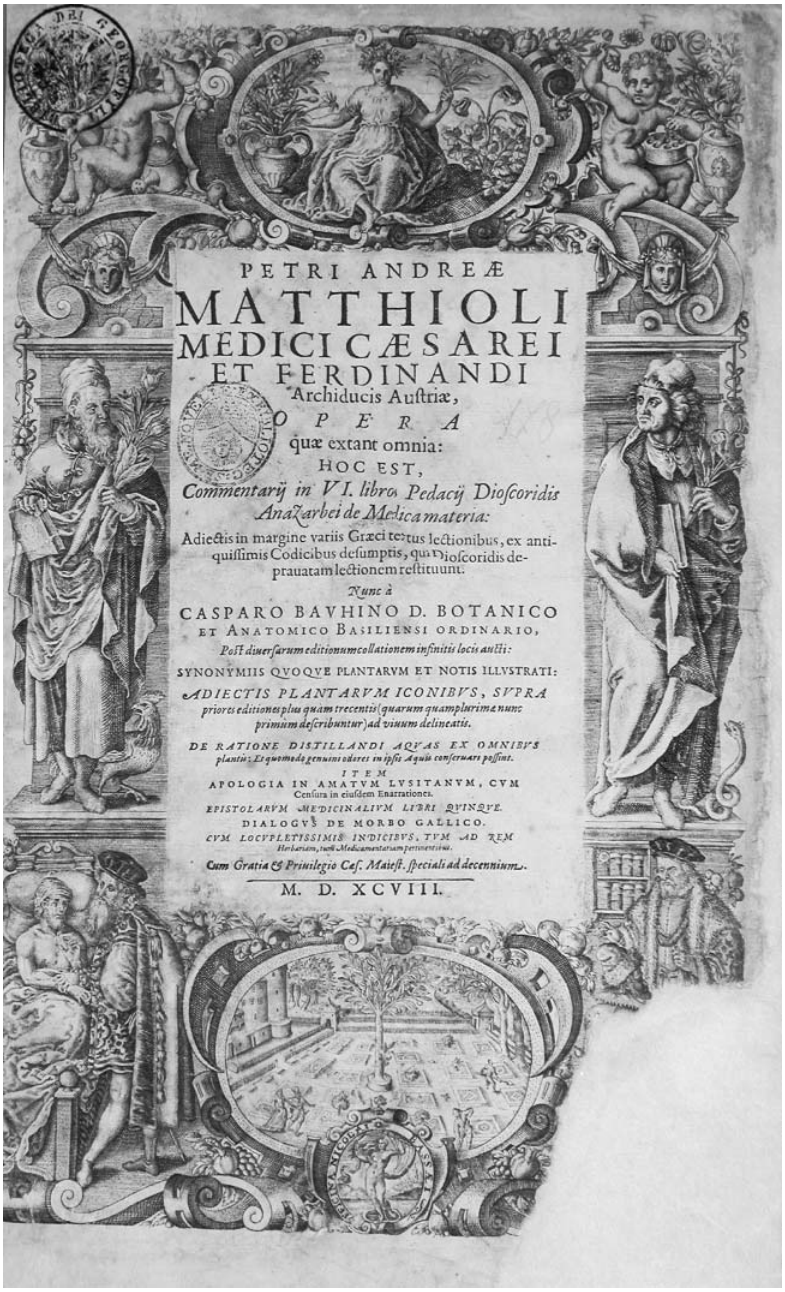

4.

Book-cover of "Trattato de' semplici", published in Venezia by Pietro Maria Vertano in 1631. Picture genlty supplied by Accademia dei Gergofili Library, coll. R. 300