

Classic and Modern Agricultural Treaties: its Reception in the Hispanic World

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Received Date: October 10, 2017; Accepted Date: November 02, 2017; Published Date: November 08, 2017

Citation: Elio Vélez Marquina (2017) Classic and Modern Agricultural Treaties: its Reception in the Hispanic World. J Food Nutr 3: 1-10.

America and Renaissance Technology

The so-called technology transfer from the Old to the New World is an act of transculturation. Far from being understood as the “subjection” of one culture to another, agricultural transculturation implies the creation of new paradigms for new spaces and new species. The Viceroyalty of Peru, however, has not yet been properly analyzed as the laboratory that it was. Quite the opposite, it has only been studied through the lens of technology transference and the acclimatization of spices. With the arrival of new European fauna and flora, American nature updated the status of its biodiversity during the sixteenth century. It began a known *mestizaje*, that has been never stated or evidenced. It was, therefore, the invention of a new American nature.

The period of the Habsburg Monarchy, especially the one of Charles I and Philip II, is of special importance to understand the agricultural development of America. The territorial expansion carried out by father and son reached a vast dominion in Europe that, with the effort of the first colonizers (armed with arquebuses or Bibles), covered a great part of the American continent. With Charles I, Spain reached the rank of empire. This dignity, when losing the Germanic territory with the death of Charles, was elusive to Philip II, who in turn gave to its territories a powerful bureaucracy.

It is in this political context that the West Indies enter the European imagination: an immense overseas territory, only dreamed as utopias, suddenly brought its people and its products to the Old Continent from the ports of Spain. However, the happiness that should have supposed for Europe - and more precisely for Habsburg Spain- the discovery of the American soil became a series of paradoxes that affected mainly food.

In contrast to the abundance of American biodiversity, the sixteenth century greeted Spain with the claws of hunger. And it hit Spain's territories with the production of an essential ingredient for the modern diet at that time: wheat.

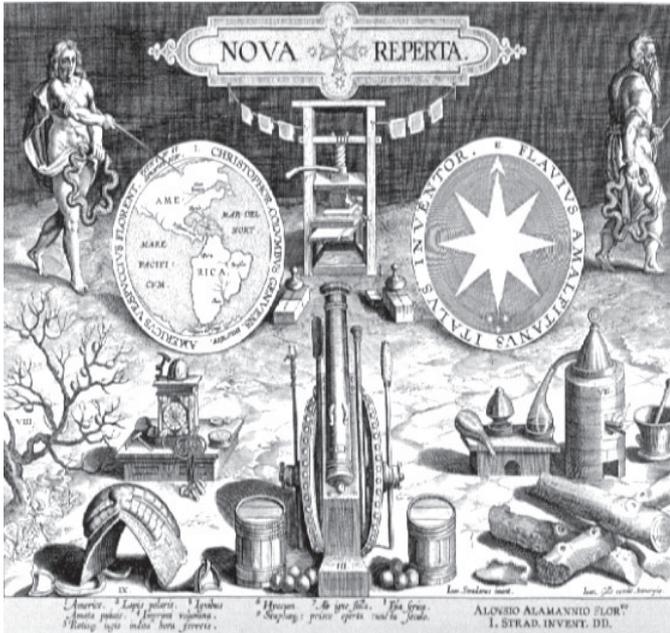
Throughout the sixteenth century, in the Andalusian regions and in Spain, in general, there were years of bad harvests that resulted in terrible famines for the population, in which, at the risk of popular rebellions, the kings chose to limit the origin of the wheat exportable, especially to America, to certain areas less punished by hunger, since the population did not allow the food to leave their cities and attacked the warehouses of provisions. These years of hunger were frequent. For example in 1508 a locust plague occurred in Seville that left the city without wheat and the Cabildo was forced to ask permission to buy it elsewhere (Laura María Iglesias, *La transferencia de la tecnología agronómica de España a América*, 74, my translation).

By the end of the century, various climatic and natural conditions hurt Spain with a harsh bite in the middle of a technological boom scenario. The crisis of wheat that swept the south of Spain encouraged the expansion of such crops in American territories throughout the sixteenth century¹.

At the same time, however, there was a considerable technological boom. Discounting the view of the Middle Ages as an obscure period for research, it must be recognized that “the whole life of medieval man, and therefore also his relation to nature, was under the norms and laws of Christian ethics” (Meyer, *The Technification of the World*, 31). The technological modernity with which the Renaissance breaks out in Europe and its projection towards the seventeenth century coincides, therefore, with the appearance of America in the imperial stage of the Hispanic World².

In America, there was also a demographic crisis due to several epidemics recorded both in the Viceroyalty of Peru and in New Spain (Mexico) during the sixteenth century. However, this decline in native population did not prevent the development of agribusinesses such as wheat.

Hermann J. Meyer has explained in his volume *The Technification of the World* how the origin of the so-called modernity must be traced to the thirteenth-century Oxford Franciscans: “From the Franciscans of Oxford there is an uninterrupted line to the nominalist school of Paris of the fourteenth century, to William of Ockham “(33).



Cover page

Johannes Stradanus, *Nova reperta*, circa 1580

History grants the role of agent to Europe in the supposed discovery of the New World. This erotization by which a Columbus or Vespucci approaches the naked body of an Amazon-America is even found in one of the paradigms of modern iconography: the set of engravings designed by Johannes Stradanus with the help of the Galle family. He, also known in Italian as Stradano, is the author of the set of engravings titled *Nova reperta*, that is to say, the new discoveries or inventions.

America was represented as a female body, like an untamed and ferocious Amazon. From that look, the allegory of America was very similar to that of Athena and, of course, that of the Greco-Roman Amazons. Nevertheless, the primitive representations of the allegory of America stand out by two great differences.

First, there is the exotic component of the fauna: either on an armadillo or on a lizard, this new Amazon is always armed and ready for combat. These animals play a very important role in the understanding of the American space that until now has not been pointed out. They are animals that surprise by their exoticism and ferocity, but also because they were not conceived in Europe for human consumption.

On the other hand, there is the fact that in many representations America appears with a human head hanging from one of her fists. Unlike a nymph that shows fruits that represent abundance such as grapes or grains like wheat, America appears accompanied by unknown beasts and the head of a man. Cannibalism marked, as has already been explained, the imprint of savagery that Americans were thought of and, by extension, their eating habits.

Although this iconographic repertoire was well known among Renaissance scholars, it has not been properly incorporated into the debate on the representation of America in the realm of viceregal studies. Less has been considered this repertoire within the histories of the feeding, already European and American.



Allegory of America. Abraham Ortelius. *Theatrum Orbis Terrarum*. Antwerp, 1570. Print of Joris Hoefnagel

Arguments such as those of Jacques Lafaye on the perverse technification of European nations during the sixteenth century must be considered, but at the same it should be understood alongside? this evidence. It is true that there was a powerful deployment of engineering for the elaboration of war machines (and the Leonardo Da Vinci manuscripts are a beautiful testimony of this type of technology); but in the Stradanus *Nova reperta* the new discoveries of the century are far more transcendent than mass destruction.

On the *Nova reperta's* cover, along with the utensils one can see an olive tree and, inside? one of the shields, the map of the new American territory. Thus, America is the great space that frames the projection of Europe's scientific knowledge. Here, the engraving in which Amerigo Vespucci greets an Amazonian American speaks to? the desire that was projected on the New World's soil. And in the same soil, towards the second half of the century, both the olive trees and the distillation machines paid off.

The distillation workshop (distillatio) that portrays Stradanus' talent shows a bundle of grain. This technology would then be applied to grape juice. But the juice that draws our? attention is that of *oleum olivarum*, that is, the olive turned into oil. The almazara (Mozarabic term to refer oil press), unlike the first, shows a natural scene at its vanishing point: the olives which fruits will be processed. It even identifies the beast of burden that would then distribute the oil.



Process of distillation

Johannes Stradanus, *Nova reperta*, circa 1580



Olive oil (oil press)

Johannes Stradanus, *Nova reperta*, circa 1580

To these inventions must be added the production of cane sugar and wind, and water mills. It is surprising that at least 6 of the engravings allude to both America and its agricultural technology. Another great invention or novelty that can be seen in these engravings is that of the printing press (*impressio librorum*, ie the printing of books), without a doubt the main tool for the dissemination of knowledge that was not only a literary tool, but that was also involved in the production of technical treaties. Agriculture was no exception.

In the last decade of the fifteenth century, Christopher Columbus expressed the need to reproduce the crops and the European livestock culture for the better life of the colonizers? and then received instructions to carry out said technology transfer company:

Despite the booming transatlantic trade in wheat flour and red wine, settlers recognised that the importation of European food would not provide a permanent solution to their dietary needs. They needed to cultivate these items themselves were their colonial outposts to survive... The pressing need for European foods led settlers to attempt to 'Europeanise' the new-world landscape... by introducing old -world plants and animals (and, inadvertently, weeds and other pests) (Rebecca Earle, *The Body of the Conquistador*, 69)



Printing press

Johannes Stradanus, *Nova reperta*, circa 1580

Without delay, as Earle points out in his detailed study, early European settlers, mainly Spaniards, saw the need to move European crops, as well as livestock, to the American soil. The importation of wheat flour and wine (irreplaceable elements of the European diet) was perceived as problematic from the final decade of the fifteenth century onwards. For this reason, Columbus sent vines, grains, legumes, sugar cane and certain livestock to America during his second voyage. On his third voyage, he carried wheat with him³.

There was, without a doubt, a transformation of the American landscape. Soon they were given instructions - both in New Spain and in Peru - to favor and expand the crop either of wheat or grapes⁴. The valley of Lima, adjacent to the capital of the viceroyalty, was the starting point for experimenting this agricultural transfer. Royal Decrees of Carlos I show the importance of thinking about the need to recreate the necessary conditions for an agricultural culture capable of reproducing the Hispanic diet.

Labourers were offered free passage to the Indies and grants of land and were to be supplied with the necessary tools, plants and seeds. The thirty families from the Andalusian town of Antequera who in 1520 travelled to the Indies to settle were thus equipped with 400 spades and hoes, along with many other agricultural implements, and brought with them 120 fanegas of wheat, 12 fanegas each of garbanzos, broad beans and flax, and cuttings of onion, cardoon, mustard, sesame, cabbage, parsley, cilantro, radish, watercress and hemp, as well as over a thousand olive trees, 200 quince trees, 190 plum and fig trees and 15 almond trees (Rebecca Earle, *The body of the Conquistador*, 70).

³Rebecca Earle describes very well the transportation of European inputs from the Colombian texts. He also mentions, with a series of quotations from medical and chronic treatises, the insistence that there was at that time for the consumption of wheat bread and red wine (see the second chapter, "Protecting the European Body" 54-83).

⁴For the Peruvian case there is some discrepancy about who introduced the wheat. For Inca Garcilaso (1608) was Doña Maria Escobar in 1545. In contrast, for Bernabé Cobo was responsible Doña Ines Muñoz de Castro. This chronicler refers that Doña Ines occupied a prominent place in the agricultural production of some valleys, as much of the mountain range as of the coast, mainly in the valleys of Lima. Wheat was, therefore, the most extensive cultivation in the Lima chacras. In the days of the Gasca (1550) 229 fanegas were produced in the capital. Such was the surplus, which was exported to Guayaquil and Panama, plus a set of 200 thousand pesos from Chile (Ileana Vegas de Cáceres, *Economía rural y estructura social en las haciendas de Lima durante el siglo XVIII*, 63).

The enormous amount of vegetables brought to America speaks to the fact of the necessity for self-sufficiency. In addition, there were many families of peasants, such as those listed in the document cited by Earle, involved in the process. These came to America very well endowed to initiate the transfer of species. Technological transfer, however, entailed the arrival of machinery, and thus new species, grafts, and technology already put into use had to be operated by settlers or Native Americans willing to work in the field.

The material evidence described in letters, decrees, ordinances, judgments, and other bureaucratic literature has distracted scholars from a type of literature fundamental to what many have called the *Europeanization of the American landscape*. The effective agricultural technology transfer could have been carried out at the beginning by peasants and cattlemen brought from Andalusia, but once? in America this technique had to be transferred either to the children of Spaniards (Indians) or Indians (American natives). For this, the printing press played a crucial role. To the West Indies the Spaniards and Europeans of all kind arrived with plants, animals and treaties of agriculture.

Agricultural knowledge in the classical period

There exists, from old times, a technical agricultural literature. However, when reviewing the manuals or histories of Greek and Latin literature, it appears that this knowledge, fundamental to understand the development of the so-called Mediterranean culture, is invisible. To begin with, it is scientific or technical literature⁵, far from the great literature written in verse.

Prose, with the exception of the ancient Greek novel or late Imperial literature, was a vehicle for the transmission of literature of pragmatic nature, unrelated to the artistic and aesthetic prestige. Since prose was intended for a less trained public it became an ideal support for the transmission of a technical knowledge that implied an effective application of what was read. Within this heterogeneous corpus was the agronomic literature.

⁵The word technical today is inevitably associated with science, that is, with specialized and objective knowledge that imposes certainties on matter and on humanity. Here it is used in its etymological sense that is linked more with a word like art. In Greek, τέχνη (téchnē) means man-made, human material production. Romans instead used the word *ars / artis* to designate the same reality.

Over time, both terms (which by the way coexisted due to the prestige of the Greek koiné among the Romans) came to designate textual production of a practical or technical redundancy. This was as true for a grammatical or rhetorical treatise as for a medical, veterinary, or astrological treatise.

Should we be surprised that up until now those who have studied the history of food, whether in Europe or in America, have paid so little attention to this corpus of texts in order to understand the technological development of agriculture that supports the foundations of food systems? The refusal to do so is transparent and paradoxically shadows a considerable part of knowledge⁶.

The first Greek treatises of the Hellenistic period, like that of Theophrastus of Éreso, concretely approach the natural world from a pharmacological botanical perspective. It is only until the Roman hegemony that one can find much more detailed agronomic treatises. In the Latin sphere, such treatises are catalogued or described within the so-called *non-grammatical technical prose*⁷.

Latin technical literature requires certain considerations on its own?. This could be used for educated people (formally instructed in the *Litterae*) who wanted to expand their liberality, that is, their capacity to better understand reality with its different nuances. This scenario, undoubtedly, responds to the imaginary that currently exists regarding the literate city of the modern era.

⁶For example, Laura María Iglesias Gómez in his voluminous and detailed study *La transferencia de tecnología agronómica de España a América de 1492 a 1598*, published by the CSIC, examines an important textual corpus that has not spared in the manuscripts guarded by archives like AGI. It also examines the information provided by the chroniclers of the Indies and gives valuable information on the types of cultivation, the type of breeding and other realities proper to the subject. However, it does not devote a single line to existing agronomic treatises for the time. Certainly, this technical knowledge has a remarkable oral component, the wisdom transmitted from generation to generation; however, a task controlled and promoted by the Spanish Crown itself relied on more than the goodwill, strength and experience of the peasants of southern Spain.

On the other hand, Rebecca Earle in her scholarly and suggestive study *The Body of the Conqueror* alludes to a large amount of literature from the fifteenth, sixteenth and seventeenth centuries related to health and body care from eating. She knows the agronomic treatises and, above all, cites that of Alonso de Herrera, but she does so for very specific purposes. Earle is particularly interested in the construction of new food paradigms and, therefore, goes to texts, even technicians, to find support for new ideas about food. At a lower average, the transfer of agricultural technology is important for this work.

⁷Of indispensable consultation is the chapter "Ciencias" elaborated by Juan Antonio López Férez for the *Historia de la literatura griega* of the publishing house Cátedra (964 - 988). López Férez, publisher of the same volume, records a valuable bibliography in that section.

Yet one has to consider another less erudite and noble reality. Latin technical prose had, above all, a *literate public* with little learned training. Practical technicians, such as farmers, required a text to confirm their knowledge or to use it as a memory repository. This dimension is fundamental to understand the type of practical literacy that supported the transfer of agricultural technology to America.

Of Latin antiquity, there are at least three authors whose agronomic treatises have been especially influential in the European culture of the sixteenth and seventeenth centuries, ie the most relevant centuries for the consolidation of a new ecological system in America: Marco Porcio Cato, L. Juno Moderato Columela and Paladio Rutilio Tauro Emiliano, commonly known as? Cato, the censor, Columela and Paladio⁸.

Cato and his *De agri cultura*

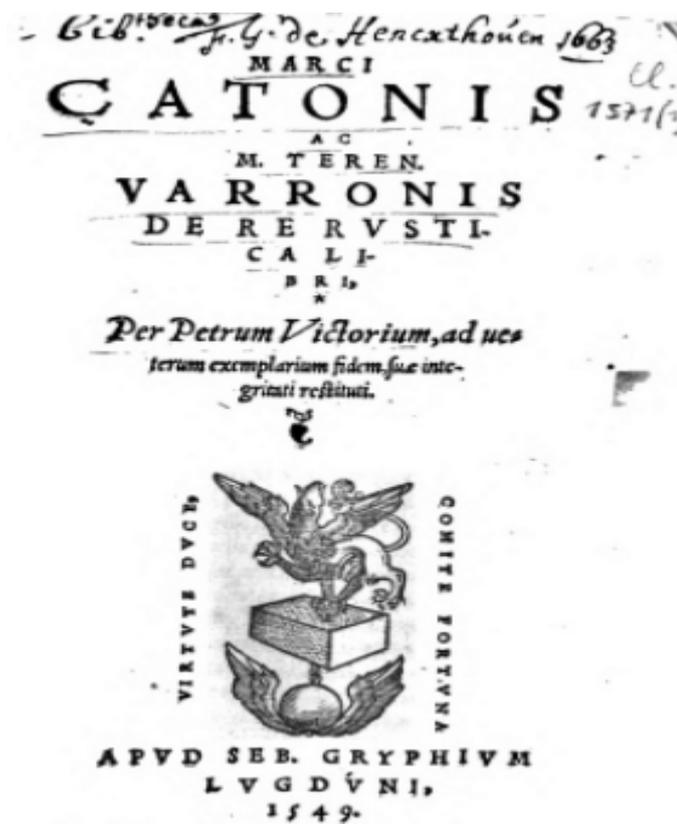
Of the three, Cato, a celebrated figure of the Roman Republic, enmity with Cicero and biographed by Plutarch, is the author of the first Latin prose work preserved in its entirety: *De agri cultura or Treaty of agriculture*⁹. The work is fascinatingly complex, since it provides heterogeneous and complementary information: it contains detailed instructions for the construction of mills and presses of olive oil; in the same way, describes the lime kiln; set aside culinary and dietary recipes; comments and describes legal contracts, agricultural rites and spells for the harvest.

Leaving aside the controversies about the originality of the work, its haphazard handwritten transmission and the problematic composition of the text, it is convenient to focus on a fundamental aspect of this treatise that was published from Italy to the rest of Europe at least through two editions (one of them by the famous humanist Poliziano): *De agri cultura* shows a considerable change in the type of Roman culture by which the imperial era opens and that would reconfigure the ecological systems of the so-called Mediterranean culture. It is, therefore, a question of the transition from polyculture to monoculture.

⁸There are several modern or Latin or bilingual editions or those that present a philological translation. The Latin texts can be consulted online, but they lack translation. Such is the case of the digital repertoire The Latin Library. For this work the Spanish translations of Gredos have been used, although at all times the Latin texts have been consulted to corroborate certain technicalities.

⁹The work is quoted from the edition of Alfonso García-Toraño Martínez, Madrid, Gredos, 2012. In its various manuscript testimonies, the work is also called *De agricultura*, *De re rustica* and *De rebus rusticis*. The translation into English is mine.

Discarding wheat, a conflictive grain for the Romans of the late Republic, Cato's text focuses mainly on the cultivation of olive and vine. Both crops are arranged in all their dimension: agronomic, dietetic and commercial. The quality of the information offered by Cato is surprising. The mills and olive presses differ little from those represented by Stradanus with the help of the Galle family and resemble those nowadays used in traditional mills in Europe and America.



Edition of Lyon of 1549 that brings the works of Cato and Marcus Terentius Varro

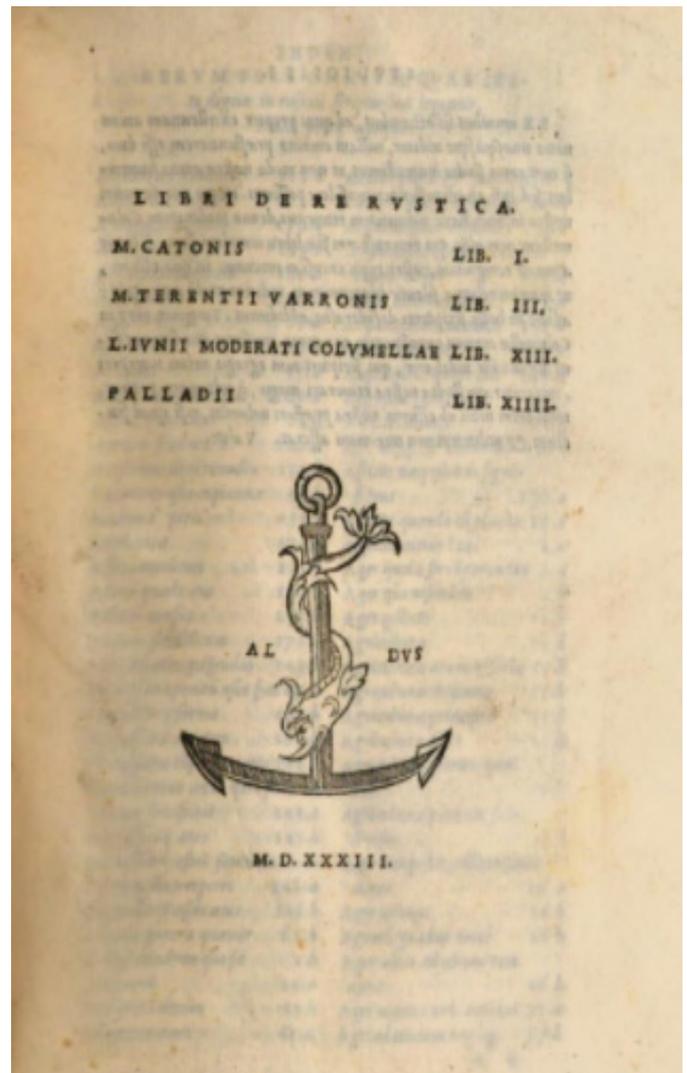
The treaty describes in relative detail (it should be remembered that it is not a very detailed technical treatise) the planting of the vine as well as the olive tree. His comments on the manufacture of wine and oil at all times point to the performance of the plant and the best business that can be carried out with the product. The councils on olive oil seek more profit than the quality of the same, although Cato himself distinguishes between the qualities (which later Columella comments in greater detail). The case of wine is similar. Above all, the author points out a series of techniques to distinguish the alteration of the same or to modify its flavor and consistency according to the taste of the commensals.

On the other hand, Cato indicates a series of recipes with these ingredients. The wines are prepared, as well as olives and oils of various characteristics. However, wheat - which is not treated as a crop - dominates the recipe section which is a pristine collection of pastry and bakery. The great variety of breads and cakes (savory, sweet, with cheese, candies ...) confirms the relevance of wheat in the table of the republican Romans.

Cato's treaty is an extraordinary example of the combination of technical and moral, and economic prescriptive. A type of democratic text is inaugurated in the measure that by the simplicity of its style it appeals to both the paterfamilias and the slave. In effect, Cato uses as rhetorical strategy the speech directed to readers of different social condition and, therefore, with different access to the literate culture. Thus, a style of technical-didactic manual was born, which, as we will see, had a considerable influence on the later transmission of agronomic techniques during the sixteenth and seventeenth centuries.

The agronomic literature of Columella

Unlike the Sabino-Italic origin of Cato, L. June Moderato Columella bore that of hispanicus, that is, Spanish. He was born in Gades (present-day Cadiz) in the Betica region of Roman Hispania. He was not a simple technical connoisseur of the matter: he possessed lands in diverse regions of the Lazio and visited many other regions of the Roman empire. He had, therefore, direct contact with the agricultural exploitation that combines favorably with erudition. From Columella two works have been preserved: *Res rustica* and *De arboribus*. The first one consists of 12 books and is, according to the general opinion, the most complete and systematic treatise of classical agronomy¹⁰.



Edition of the aldina (Aldus Manutius) printing press of 1533 Includes the texts of Cato, Varro, Columella and Palladium.

¹⁰The Spanish translations of the edition of José Ignacio García Armendáriz, Madrid, Gredos, 2004 have been used. The Latin text of his works can be consulted at the following link <http://www.thelatinlibrary.com/columella.html>

In the first chapter, he exposes his ideology regarding agronomic knowledge and unfolds his erudition embedded in the corresponding Greek literature. This treaty is, in fact, an agricultural manual that will be imposed as a model text for technical literature of the sixteenth and seventeenth centuries. From book II to V, agriculture is treated exclusively; from VI to IX, livestock (which Cato, for example, almost completely ignores).

Book X, of special importance, stands out from the rest of the set, since it is not written in prose but in hexameters. It is dedicated to horticulture, that wonderful complement of domestic economy that allowed families to be self-sufficient and that, over the centuries, was of vital importance to the first Spanish settlers in America.

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APVD SEB. GRYPHIVM
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Autonomous edition of the work of Columela, Lyon, 1548

The erudition of Columella is reflected in the vast tradition that he collects. It shows a marked predilection for the Carthaginian treatise of Magon (which was early translated into Latin), the Greek technoaquiculture books and the Latin texts of Cato, Varro and the Virgil of the Georgics. Only for this fact, his work constitutes a remarkable contribution to the tradition, because it systematically compares the different positions of ancient and modern authors.

Although part of the criticism gives epigonal character to the work of Columella, it is necessary to point out its true contribution. Certainly, he adopts a traditional position in the management of the agronomic tradition; however, he is a true precursor in agricultural economic policy. Many of Columella's measures were highly recurrent during the sixteenth century.

Contrary to his contemporaries, he argued that the scarce profitability of the land is not due to its exhaustion (which is solved with fertilizer and other means of recomposition), but to the absence of rational agriculture. For Columella, agriculture was not properly valued in society and, therefore, landowners had to be instructed in the economic management of land, better management of peasants (often slaves), and better exploitation of resources.

Likewise, the modernity of Columella's work for sixteenth-century Spanish readers lies in the fact that he wrote for the Roman landowners. This aristocratic group had left aside its estates in foreign hands and, in the worst case, inexperienced. This paid off in an agrarian crisis. In this way, the councils acquired pertinent contemporaneity for the Spaniards who had to colonize the American soil with the support of the original populations that had to adapt to new European technologies.

In the manuscript tradition, at the end of the work of Columella, there is an appendix that today is published separately with the name *De arboribus (Book of the trees)*¹¹. This book confirms that his contribution goes beyond mere compilation. There are valuable instructions on the cultivation of vine and olive, from planting and harvesting to the treatment of grafts for better reproduction.

Late empire agriculture: the case of Palladius

Paladio Rutilio Tauro Emiliano is usually thought of as an epilogue of the *scriptores rei rusticae*, that is, of the Latin agronomic writers. The basis of this statement is chronological in nature: it is the last of the technical writers dedicated to agriculture (IV-V centuries).

His works *Opus agriculturae, Veterinaria and Carmen de Insitione*¹² are, in fact, the result of the accumulation of Greco-Latin knowledge, but no longer original. Unlike the rhetorical style proper to Columella's work, that of Palladius is flat and, in imitation of the primitive treatise of Cato, he appeals to the uncultivated peasantry. For example, its *Opus agriculturae (Treaty of agriculture)* is organized according to the agricultural calendar, which confers an incontestable authority to him who spends more time plowing the earth than reading about pests or utensils for sowing.

His deliberately colloquial style (which sometimes falls into vulgarisms) precedes Gabriel Alonso de Herrera's *Libro de agricultura*. This polyvalence should not be taken as contradictory. Both Columella and Palladius include in their works treatises written in verse, because a crucial component of his public is the Roman landowner. The concessions to the peasants must be supposedly mediated by a possible reading aloud carried out by the paterfamilias. This same scenario must be considered for the reading of agronomic treatises in sixteenth-century Spanish America. The peasants, finally, applied in the field what the lord of the land understood from reading certain text.

In sum, the Latin agronomic tradition represents the basis of the technical knowledge that Renaissance Europe exploded in a good account. The discovery and subsequent conquest of America by the Spanish Crown transferred this technical discourse to a new ecological system that did not go through the agrarian crisis of wheat (that of Andalusia), but had to face the arduous work of adaptation to the new technology agriculture carried out by Spanish settlers. It remains, therefore, to confer the exact dimension of the transfer of agronomic technology carried out from the silent pages of the agricultural text books with which the Spaniards were guided in the dense darkness of a landscape which was hostile to them, to say the least.

III. Agricultural treatises in the Hispanic World

The XVI century was especially fruitful for agronomic literature in Spain. The works of the Latin authors, mainly, were diffused either by their French and Italian editions or by one of the most advanced works of his time. This is Gabriel Alonso de Herrera's *Libro de agricultura*¹³.



Edition of Alcalá de Henares of 1524, printed by Miguel de Eguía

¹¹De Arboribus is independently edited since the Venice edition of Venice (1514).

¹²It is cited according to the edition of Ana Moure Casas, Madrid, Gredos, 1990. To read the Latin text, see the following link <http://www.forumromanum.org/literature/palladius/agr1.html>

¹³The editio princeps of Alcalá de Henares was published in 1513 with the title of *Libro de agricultura*. Although I was not able to revise this edition, I consulted the three copies of the sixteenth century whose covers declare to have been revised and augmented by the author himself: those of Alcalá de Henares of 1524 and 1539 and the one of Logroño of 1528. To understand the complex textual transmission of the Herrera treatise, it is recommended to consult the study by Mariano Quirós García «El Libro de Agricultura de Gabriel Alonso de Herrera: un texto en busca de edición», *Criticón*, 123, 2015, 105-131.



Edition of Alcalá de Henares of 1539 printed by Joán de Brocar

The work of Herrera is indispensable for the study of the transfer of agronomic technology from Spain to America, that is, in the transatlantic dimension of the Hispanic World. Its popularity is not under discussion: as Mariano Quirós García points out only in the 16th century it was published 12 times in Spanish and 5 in Italian (110). Regardless of its potential best-seller status, Herrera's study stands out because of its advanced editorial status: although it was written at the request of Cardinal Cisneros, it is the first agronomic treatise of the European Renaissance written in Romance language.

On the one hand, *Libro de agricultura*, following the models of Cato and Palladium, bet on a plain language that, in addition, abandoning the Latin proper of scientific treatises, systematically exposes the knowledge of Latin agronomists in Spanish language. The same title declares this will of synthesis. But Herrera was not a mere humanist (he belonged to a select group as revealed by the request made by Cardinal Cisneros himself) dedicated to the study of Latin writers. The biographical segments of his work (which were removed in the 1569 edition) reveal that he travelled to France and Italy to learn different types of crops and techniques. Likewise, his fondness for gardens that he took care of in his residence of Granada is very well-known. Without a doubt, he was above all a practitioner of his science.

Nevertheless, the work of Herrera encloses for the study of the history of feeding in the Hispanic World great treasures to discover and study. On the one hand, there is the lexicon by which he designates agricultural paraphernalia that is crucial to understand the material state of technology transfer from Spain to America. On the other hand, we should consider the description of agronomic practices that allow us to understand the state of agriculture by which the Spanish settlers made the first transplants to the American ecological systems and which then became in a *mestizo* form of agriculture.

For example, in folio 96 of chapter III, Herrera talks about the type of soil in which the olive trees must be planted. Before that, he distinguishes between two types of plants through a synecdoche strategy: he calls olives to plants, that is, *pars pro toto*, the part for the whole. Thus, he distinguishes between the small olives and the fat olives.

In a personal communication, the expert olive grower Gianfranco Vargas Flores explained that this distinction refers to the quality of the fruit and not a genetic variety of olive. Certainly, at the present time, the name is linked to the Gordal of Seville, when in fact it is a characteristic of European oil: Gordal is called olives weighing more than 12 grams. In this way, it refers to an olive tree that yields large olives. The small ones, therefore, will be those that by conditions of soil and exposure to the sun and wind yield fruits of smaller size.

Then, following on olive trees, Herrera comments, without using the current term, cross-pollination. Later, he comments on how the pomegranate tree should be planted among the olive trees so that they can flourish and fruit better. This favorable condition is due to the fact that the flowering of pomegranate favors that of the olive tree, just as today gum trees, *olivos machos*, (*sapium glandulosum*) are planted among the olive trees. This is called a *Sapium* variety that produces a berry from which rubber is extracted. This tree has served for centuries for cross-pollination of olive trees.

The information gathered in *Libro de agricultura* invites us to reflect on some facts of the olive plantation in America and specifically in the Viceroyalty of Peru. On the one hand, the Creole variety that today is assumed to be indigenous in Peru, Chile and Argentina (in these countries they are also called Arauco) must not necessarily be the Gordal of Seville, since as evidenced by Herrera's text, *Gordal* means size, rather than a specific variety.

If, in the Viceroyalty of Peru, olive oil was more important than the olive fruits, it would be more probable that a variety of abundant production, such as the picual, so common in sixteenth-century Andalusia, would have been sought. Thus, there were in the Viceroyalty of Peru Picual gordal and Picual petite, either to eat as fruit or to make oil.

On the other hand, it should be noticed in the cross flowering or, better yet, in the grafts. Herrera comments on the case of the mixture between pomegranates and olive trees, in a similar way as Bernabé Cobo relates, without explicitly stating, between the olive tree and the Kkulli tree. It is the Quishuar tree (*Buddleja incana*) that receives in Aymara the name of Kkulli.

This one was confused with the olive tree to the point that lent its name to the tree brought by the Europeans. But its story goes beyond translations. This tree not only served to cross pollination of the olive trees, but it was also apparently used as a stake in a type of grafting to allow the olive trees to adapt to the sandy soil of the southern coast of the Viceroyalty of Peru. Today, a genetic study would reveal if there was such hybridization.

The agronomic treaties were of unparalleled importance during the European Renaissance. On the one hand, the Greco-Latin heritage was rescued with Latin editions of the same. On the other, Spain produced a synthetic treatise of this tradition. This textual legacy, to the present day, has not been duly incorporated into the debate on the technological transfer of agronomy to the New World.

Curiously, the same symbolic representation of America (as is evident in the iconography modeled by Stradanus) was part of what the European imaginary saw as new in the sixteenth century. With this, the positive sense of the novelty seen as technological advances is implied in the measure that America is in the cover that precedes a series of engravings on the most advanced technology of XVI century.

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