

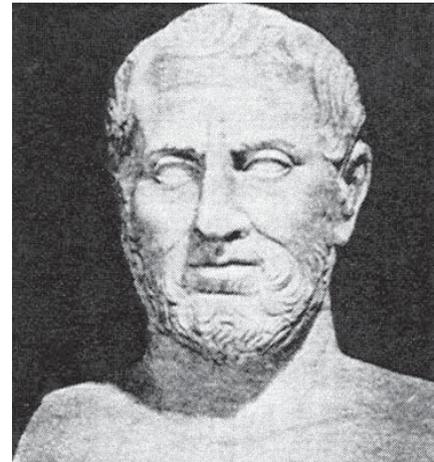
Lecture 19

Greek, Carthaginian, and Roman Agricultural Writers

Our knowledge of the agricultural practices of Greece and Rome are based on writings of the period. There were an enormous number of writings on agriculture, although most of them are lost we know about them from references made by others.

Theophrastus of Eresos (387–287 BCE)

The two botanical treatises of Theophrastus are the greatest treasury of botanical and horticultural information from antiquity and represent the culmination of a millenium of experience, observation, and science from Egypt and Mesopotamia. The first work, known by its Latin title, *Historia de Plantis* (Enquiry into Plants), and composed of nine books (chapters is a better term), is largely descriptive. The second treatise, *De Causis Plantarum* (Of Plants, an Explanation), is more philosophic, as indicated by the title. The works are lecture notes rather than textbooks and were presumably under continual revision. The earliest extant manuscript, *Codex Urbinas* of the Vatican Library, dates from the 11th century and contains both treatises. Although there have been numerous editions, translations, and commentaries, the only published translation in English of *Historia de Plantis* is by (appropriately) Sir Arthur Hort (1916) and of *De Causis Plantarum* is by Benedict Einarson and George K.K. Link (1976). Both are available as volumes of the Loeb Classical Library.



Theophrastus

Theophrastus (divine speaker), the son of a fuller (dry cleaner using clay), was born at Eresos, Lesbos, about 371 BCE and lived to be 85. His original name, Tyrtamos, was changed by Aristotle because of his oratorical gifts. He came to Athens to study under Aristotle, 12 years his senior, at the Lyceum, a combination school, museum, and research center under the patrimony of Alexander. The Lyceum of Aristotle was to Plato's Academy as the land-grant colleges were to the established universities. Theophrastus inherited Aristotle's library, manuscripts, and gardens and succeeded him as head of the Lyceum, serving in that capacity for 35 years. His students (disciples) numbered over 2000. Diogenes Laertios lists 227 treatises attributable to Theophrastus, but the main works that have survived intact include his two botanical treatises and one on stones. Various fragments also exist on such diverse topics as odors, winds, and sweat. Theophrastus is also the author (perhaps editor) of a series of 30 character sketches of human weaknesses that have been considered a minor literary masterpiece for over 23 centuries. His influence was enormous. There is now a list of 1500 references to his work by ancient authors. A new collection of his work is in preparation (Project Theophrastus) in the series Rutgers Studies in Classical Humanities.

Theophrastus, called the Father of Botany, might better be called the Father of Horticultural Science. He mentions over 300 species, practically all cultivated and most of them horticultural. The two treatises are a mixture of personal observations and reports of others, probably traveling students, but Theophrastus often specifically interjects his own belief. The striking feature is the systematic approach to information and the extensive compilation of botanical facts and plant lore. He is interested in the great problems of botany. How do plants grow and reproduce? How should plants be described and classified? What is the variation inherent in plant life, and what is its cause? What accounts for the geographic distribution in vegetation?

While interested in plants for their own sake, he was also concerned with the human applications of botany, in short, a horticulturist. Throughout, the work is infused with facts and the spirit is rational. He distinguishes between sexual and vegetative reproduction, dicotyledonous and monocotyledonous plants, and angiosperms and gymnosperms. On the horticultural level, he gives technical descriptions of graftage and cuttage and discusses the role of pollination of date palms and the caprification of fig.

Theophrastus's two treatises on plants are not scientific in the modern sense, for they represent descriptive rather than experimental science. Despite their clarity of thought and rational reasoning, one searches in vain for evidence on the mode of investigation or a process of verification. There are only facts and conclusions. There are brilliant insights, but also embarrassing credulity.

Theophrastus was centuries ahead of his time and little was added of substance until the Renaissance. Yet his influence in the medieval period was much less than that of Dioscorides of Anazarbos, a Roman physician of the first century and author of *Materia Medica*, who merely catalogued and described plants but proscribed medicinal uses, mostly fanciful. Thus the herbal tradition derived from Dioscorides, replacing the scientific spirit of Theophrastus, was responsible for the actual loss of botanical information. The significance of sexuality in plants, clearly defined by Theophrastus in his description of dates, seems to have been forgotten until its reintroduction in 1694 by *Stephan Hales* and *Rudolph Jakob Camerarius*. Modern botany and horticultural science are in one sense a return to the Theophrastian tradition.

Selections from Book I of *De Causis Plantarum*, translated as "*The Modes of Propagation in Woody and Herbaceous Plants*" and "*Propagation in Another Tree: Grafting*," are particularly rich in horticultural allusions (see **READING** 19-1). Although Theophrastus felt obliged to list spontaneous generation as a means of propagation, he is quick to note that most examples are better explained by imported seeds or very small, unnoticed seed. His discussion of grafting is very up-to-date and with little editing would be appropriate for a modern manual. Theophrastus's discussion of the effects of scion selection and rootstocks forms the basis of modern fruit culture.

References

- Einarson, Benedict, and George K.K. Link (translators). 1976. *Theophrastus: De causis Plantarum*. William Heinemann, London.
- Greene, Edward Lee. 1983. *Landmarks of Botanical History*. (rev. ed.). Stanford University Press, Stanford. p. 128–211.
- Hort, Sir Arthur (translator). 1916. *Theophrastus: Enquiry into Plants* (2 vol.). G.P. Putnam, William Heinemann, London.
- Sarton, George. 1953. *A History of Science: Ancient Science through the Golden Age of Greece*. Oxford University Press, Oxford. p. 547–561.
- Singer, Charles. 1921. Greek biology and its relation to the rise of modern biology. p. 1–101. In: C. Singer (ed.). *Studies in the History and Method of Science*. Oxford at the Clarendon Press, Oxford.

Mago (? 350 BCE)

Mago, from Carthage, has been referred to as the Father of Agriculture based on a 28 volume agricultural treatise written in Punic that is now lost. When Carthage was conquered by Rome the Roman senate decreed that his agricultural works be translated. Fragments of Mago exist as quotations from other writers. The following quote of Mago is from Columella.

One who has bought land should sell his town house so that he will have no desire to worship the households of the city rather than those of the country; the man who takes great delight in his city residence will have no need of a country estate.

Marcus Porcius Cato (234–149 BCE)

Cato the earliest of the Latin writers is known as Cato the Censor based on his position as a Roman magistrate involved with the Census, but perhaps a pejorative, punning on the fact that censorius means severe and Cato is known to have been harsh and cruel to his defeated foes. His original name was Priscus replaced by Plutarch, 1st century biographer, to Cato meaning "the shrewd." Born in Tusculum a few miles outside of Rome, Cato worked on his father's farm and received an early agricultural education that molded his life. He had a 26 year military career, and was a soldier in the second Punic War against Carthage and later served in Thrace, Greece, and eastern Spain after which he returned to civil service. He

was named Censor in 184 BCE. In later years he became the owner of large farms run by slaves. Cato championed the common citizen and was a relentless foe of the aristocracy and extravagance. An extreme nationalist he grew to hate the Carthaginians who were recovering from the Punic wars, ending each of his speeches to the senate with the ringing phrase *Death to Carthage* and at the time of his death, the Third Punic War began.

Cato was a prolific author and is regarded as the father of Latin prose. However, the only complete work of his to survive are a loose collection of agricultural instructions and advise, in essence a farmers notebook, about the care of farm estates This famous agricultural manual *De agri cultura (De re rustica)* is the earliest extant specimen of a treatise in Latin prose. It consists of a collection of disjointed notes and does not compare with the finished prose of Varro or the methodical treatise of Columella. He writes of the practical aspects of crop and livestock farming, the care of estates, profits, slaves, the duties of masters, female housekeepers, and overseers (see **READING 19-2**). Precise directions are given for the construction of olive presses. He writes extensively of cabbage. Although he admonishes his overseers to be sure that servants are well provided for and do not suffer from cold or hunger but advises less food when slaves are sick and is stingy:



Marcus Porcius Cato

Clothing allowance for the hands: A tunic 3.5 feet long and a blanket every other year. When you issue the tunic or the blanket, first take up the old one and have patchwork made of it. A stout pair of wooden shoes should be issued every other year.

The treatise comes across as a contemporary handbook. Cato is concerned with practicality and profitability and deals with a number of financial subjects such as contracts, selling, and leasing. His philosophy concerning agriculture is clearly stated in his introductory remarks where the beginnings of agricultural fundamentalism is expressed: i.e. the bravest men and the sturdiest soldiers come from the farming class.

Marcus Terentius Varro (116–27 BCE)

Like Cato who lived more than a century earlier, Varro was a soldier but suffered some military misfortunes. He was a true scholar interested in literature and antiquities and was commissioned by Caesar to supervise the collection and arrangement of a great library of Greek and Latin literature destined for public use. He excelled in learning and assembled an enormous collection of writings. He was a prolific author, with almost 700 works on a wide variety of topics (literature, history, philosophy, biography, military history, music medicine, rhetoric and grammar. antiquities, and technical treatises). Only nine of his works remain, three on the Latin language and three on agriculture. *Res Rusticae* was begun in his 80th year and is addressed to his wife Fundanias, who had just purchased a farm, His three books cover agriculture and livestock including game birds and bees. Each book is cast in the form of a dialogue. His work was a source for Virgil and Pliny as well as later agricultural writers (Palladius and Vegetius).

Varro's style is erudite and windy. He is forever quoting other scholars, often passing on superstition,

defining terms. It is sometimes unclear how much of his information comes from first hand knowledge. His introduction (see **READING 19-3**) clearly demonstrates his style and is especially interesting for an extensive listing of agricultural writings. He also gives excellent information on grafting.

Virgil (70–19 BCE)

Virgil (Publius Vergilius Maro) was a great poet and the leading naturalist of his time. He is best known for his epic poem the *Aeneid*, the national epic of Rome. He was born in Cisalpine Gaul and his father was a wealthy potter or farmer who provided him with an excellent education. He received schooling in Cremona and Milan, and studied medicine, mathematics, and rhetoric in Rome, followed by philosophy in Naples. Virgil was part of a “literary circle” closely associated with the Emperor Augustus and his sister Octavia. Between 32 and 37 BCE he wrote 10 pastoral poems known as *Bucolics* or *Eclogues*, writings on life and death, the past and the future, love affairs, and even singing contests. He then spent the next seven years on a didactic collection of four “books” on farming called *Georgics* (a Greek word meaning tillage, agriculture, and rural affairs).

In the *Georgics*, Virgil transformed nature and commonplace agricultural activities, into great poetry. Discussed are the management of fields, the care of trees and vines, rearing of horses and cattle, and beekeeping. The observations are not original; the majority of the technical references in these works were accumulations from the Greek philosophers (Aristotle, Theophrastus, Aratus of Soli, Nicander—who composed a lost *Georgics*) and Romans (Marcus Porcius Cato, and Marcus Terentius Varro). Roman poets showed their skill by paraphrasing others. *Georgics* was much appreciated in the 18th century and there are many translations. The translation by John Dryden (1631–1700), used below, is considered a masterpiece in its own right.

*But various are the ways to change the state
Of plants, to bud, to graff, to inoculate.
For, where the tender rinds of trees disclose
Their shooting germs, a swelling knot there grows:
Just in that space a narrow slit we make,
Then other buds from bearing tress we take;
Inserted thus, the wounded rind we close,
In whose moist womb the admitted infant grows.
But when the smoother bole from knots is free;
We make a deep incision in the tree,
And in the solid wood the slip inclose;
The battenning bastard shoots again and grows;
And in short space the laden boughs arise;
With happy fruit advancing to the skies.
The mother plant admires the leaves unknown
Of alien trees, and apples not her own.
(p. 43)*

Virgil is quite prescient in his thoughts of selection in cattle breeding.



Marcus Terentius Varro



Virgil

*When she has calved, then set the dam aside;
 And for the tender progeny provide;
 Distinguish all betimes with branding fire,
 To not e the tribe, the lineage, and the sire;
 Whom to reserve for husband of the head;
 Or who shall be to sacrifice preferred;
 Of whom thou shalt to turn thy glebe (soil) allow,
 To smooth the furrows, and sustain the plough:
 The rest, for whom no lot is yet decided,
 May run in pastures, and at pleasure fed.*

(p. 84)

(Virgil's Georgics 1953. Heritage Press, New York)

Lucius Junius Moderatus Columella (1st century CE)

Much of what is known about the Spanish born Columella is deduced from his writings. His birth and death dates are unknown but can be deduced from his references to other historical figures. At some point Columella left Spain to live in Rome and spent the rest of his life in the general area served in the military and is referred to in an inscription at Tarentum where he is believed to have died. Columella is remembered for an in-depth. Eleven volume work entitled *Res Rustica (On Agriculture)* (11 books) and *De Arboribus (On Trees)*. They are considered to be the most comprehensive and systematic of all Roman agricultural treatises of Roman. *On Agriculture* cover (1) land choice, water supply, farm buildings, farm labor, (2) agricultural practices, (3–5) cultivation, grafting, pruning of fruit trees, shrubs, vines, olives (6–7) farm animals and veterinary medicine (8) poultry and fish ponds, (9) bees (10) gardening, (in verse!), (11) farm management, and (12) the farmers wife! The works may have been written on request or commission from a certain Publius Sivinus, known only from Columella's references to him. The work is amazingly modern in feeling, although the discussions of slaves is disconcerting (see **READING** 19-4). It is devoid of superstition.

Caius Plinius Secundus (Pliny) (23–79 CE)

Pliny was born in Verona. He served a cavalryman in Germany and from his experiences wrote his first book *On the Use of the Javelin by Cavalry*, the beginning of a literary career of enormous output. In the year 73 or 74, he was appointed prefect of the Roman fleet in Misenum, on the western coast of Italy. His death occurred during the eruption of Vesuvius simultaneous with the destruction of Herculaneum and Pompeii. We know of his death from a letter of his nephew to the historian Tacitus. Anxious to view the eruption he unwisely approached the shore, and during his visit was overcome with fumes. Quite corpulent, he may have died from a heart attack.

His famous *Natural History (Historia Naturalis)* was published in the year 77, two years before his death and is the only work of Pliny to survive. The work in 37 volumes is encyclopedic in coverage and includes information on astronomy, chemistry, geography, natural history, agriculture, medicine, astrology, and mineralogy. A popular translation covers 5 volumes, each of about 500 pages. Over 400 different authors are cited.

Pliny was a compiler and the work is a monumental



Pliny

collection of science, technology, and ignorance. Although Pliny appears overly credulous in spots, his encyclopedic coverage is the best known and most widely referred sourcebook of “classical” natural history. Pliny is also a rich source of agriculture and horticulture. Grapes and wine are discussed in rich detail with reference to 91 varieties of grapes, 50 kinds of local wines; 38 foreign wines, and 18 sweet wines. The use of greenhouses (using mica) for out of season production of cucumbers. See **READING** 19-5 for comments on various agricultural topics including grafting, caprification, pruning, cucumber, and rocket (arugula).