CHAPTER 5

Of Peaches and Peach Trees

As seen in Chapter 4, between the late Republic and the early empire, a number of new fruit varieties were developed, and also new types of fruit coming from the eastern Mediterranean started to be cultivated in Italy. Among them we find the apricot and the peach. The apricot (*Prunus armeniaca* L. or *Armeniaca vulgaris* Lam.) was first domesticated either in China or in Central Asia, but it seems to have arrived in the general Mediterranean area only in the Roman era.[1] The Latin name for this fruit, *armeniaca*, that is, the Armenian fruit, points to the area from where the fruit must have first become known to the inhabitants of the Mediterranean basin. However, unlike the peach, we cannot say much about the diffusion of the apricot in the western Mediterranean territories beyond the fact that it seems to have arrived in Italy sometime in the early first century AD. Columella mentions the apricot only twice in his work, without giving much detail, and whereas different varieties of peaches are mentioned in Pliny, as we shall see later in the chapter, he does not distinguish different cultivars of *armeniaca*.[2] The most recent review of archaeobotanical evidence known for Roman northern Italy reports the presence of apricot as rare, attested only at 1 per cent of the habitation sites considered in the study, and not present at all as offerings in necropoleis or religious sites.[3] This was an exotic fruit tree whose diffusion remained limited to elite gardens of Roman Italy and then seems to have disappeared, only to re-emerge in the West much later, as an exotic plant imported by crusaders.[4]

The peach, on the contrary, which also arrived quite late in the orchards of the Romans, is quite a special case, so it is appropriate to devote to it a

[1] Zohary, Hopf, and Weiss 2012, 7, 144. [2] See Columella, *Rust.* 5.10.9, 11.2.96.
[3] Bosi *et al.* 2020, fig. 5. The study considered 114 sites, 70 of which were 'inhabited sites and infrastructure' labelled group A, and 44 were necropoleis and religious sites, called group B. On the contrary, the peach is attested at 23 per cent of the A sites and 21 per cent of the B sites.
[4] Squatriti 2013, 173.

distinct section. Its cultivation and diffusion unify many phenomena and mechanisms at the heart of the Roman 'horticultural revolution' I have been presenting: selection of varieties to respond to market demands; geographic diffusion as exotic plant food and quick introduction as a cultivated plant in new regions; requirement of a set of know-hows which related to movements of people; appearance of its early commercial cultivation where one would most expect: at the outskirts of the largest metropolis of the Roman world, Rome itself.

The peach (*Prunus persica* (L.) Barsch.) is a member of the *Rosaceae* family, a group comprising also the apricot, plum, almond, and quince. In wild form, its origins are in Tibet/western China, but domestication of the peach in central China seems to have occurred as early as *c.*2000 BC.[5] It appears to have arrived in the Greek world via Persia by the fourth century BC, hence its name, *μῆλον περσικόν* ('Persian apple') in Greek and *persica* or *malum persicum* in Latin. Some authors suggest that the introduction of the peach into the Hellenistic Greek orchards occurred in the aftermath of Alexander's military expedition against Persia,[6] but while this is plausible, no good evidence has been found. In fact, the peach may have arrived much earlier, without the glamour of Alexander's conquests: peach remains were found in the Heraion at Samos, in levels dating to about the seventh century BC, some centuries before Alexander.[7]

It is often very difficult to determine, when finding archaeobotanical remains such as stones of fruit that could also have been transported, whether the fruit indicates local cultivation or not. Pollen, wood, flowers of a fruit tree are better indicators of cultivation than fruit stones alone; however, in the case of the peach and other fruits of the *Prunus* group (peach, plum, almond, apricot, and cherry) this is not straightforward. The wood and pollen of the various fruit trees belonging to the *Prunus* group are not diagnostic, in other words it is only possible to identify them at family level. Pollen or wood of these fruit trees can only indicate whether trees belonging to the *Prunus* group were being cultivated (so indicate arboriculture) but cannot reveal exactly *which* fruit belonging to this group it was. However, finding wood and pollen of a given *Prunus* group tree and, in directly related archaeological contexts, *also* large numbers of fruit

[5] Zohary, Hopf, and Weiss 2012, 145; cf., however, Huang *et al.* 2008, 38–9: the earliest mention of peach cultivation occurs in the *Shijing* (*The Book of Songs*), the composition of which is dated to sometime between 1100 and 600 BC. At p. 37 Zohary Hopf, and Weiss 2012 mention the discovery of peach stones at a Shang dynasty site (1600–1100 BC), whose morphology is almost identical to modern cultivars grown in China. Cf. also Zheng, Crawford, and Chen 2014.

[6] E.g., Mazzanti Bandini *et al.* 2000, 79. [7] Kučan 1995.

stones of a specific fruit of this group, makes the local cultivation of that specific fruit tree very likely. Therefore, if one excavates tree stumps that are identified as wood of a *Prunus* tree, and there is in the same archaeological layers from that site also pollen of that group of fruit trees in addition to large numbers of peach stones, the inference archaeobotanists will draw is that it is extremely likely that the trees were peach trees and that therefore the plant was cultivated locally.

As far as Italy and the western Mediterranean are concerned, it is believed that the peach was not cultivated there before the start of the first century AD.[8] Textual evidence plays a large role in this assessment. Cato and Varro do not mention this tree and its fruit in their works; Columella does, but as a plant still somehow rare, whereas, on the basis of the quotations preserved in Gargilius Martialis, the early first-century author Celsus had some observations on growing peach trees, but we do not know whether he had any comments about the spread of its cultivation in Italy specifically. Pliny the Elder is the author normally referred to in modern scholarship about the appearance of the peach on Italic soil: when discussing fruit trees in Book 15 of his *Natural History*, Pliny considers peaches, explicitly saying that they had only recently been introduced into Italy. Besides mentioning different varieties ripening at different times of the year, Pliny notes that at least one of these varieties had been developed only thirty years earlier. He regards them as hard to grow and exotic:

> *nam Persicae arbores sero et cum difficultate transiere, ut quae in Rhodo nihil ferant, quod primum ab Aegypto earum fuerat hospitium*. (Plin. *HN* 15.45)[9]
>
> As for the peach tree, it was only introduced lately, and that with difficulty, inasmuch as in Rhodes, which was its first place of sojourn after leaving Egypt. (trans. H. Rackham, Loeb edn)

It has been generally understood that Pliny was talking of Italy and that the introduction of the peach should be placed some decades before his writing.[10] His familiarity with it – despite his caution and conservative view that it was an innovation – surely indicated that soon after its appearance in Italy in the first century AD, the peach would have then spread relatively quickly, becoming an established and valued tree in the

[8] Zohary, Hopf, and Weiss 2012, 145.
[9] At 23.135 and 24.15 Pliny discusses medicinal uses of the peach.
[10] E.g., for Ciarallo (2012, 128), the peach was introduced into Italy late, 'nel 40 d.C.', primarily for medicinal purposes.

whole Mediterranean basin.[11] For all his caution about peaches, Pliny knew quite a lot about them: a few paragraphs earlier, he alludes to the existence of different varieties of peaches, among which he singles out, for quality, the *duracina* or the 'hard peach' ('nectarine' in the translation of the Latin text by Rackham).[12] Even within this *duracina* variety, selection of specific fruit characteristics had occurred, since Pliny refers to two types, the 'Gallica' and 'Asiatica', which he says are named after 'their nationalities'. Then he goes on and on: the same 'variety', the Asiatica, is said to have subvariants which ripened at different times of the year. There is the Asiatica proper, ripening in late autumn, and a variant ripening in summer, which, when it was first developed, sold on the market for 1 *denarius* a piece. It is this early-ripening (*praecox*) *duracina* subtype[13] that Pliny dates firmly as a recent development – within the last thirty years, he writes (*intra XXX annos reperta*) – not the peach in general. Pliny, in fact, does mention 'Adriatic peaches' from Sabina/Samnium and 'the common peach which grows everywhere'.[14] From this evidence, the peach may well have arrived in Italy, as a cultivated plant, at the end of the first century BC or at the very start of the first century AD. As we shall see later in the chapter, archaeobotanical remains from Emilia Romagna, which show a diffusion of locally cultivated large peaches by the first decades of the first century AD, support a late first century BC date for the introduction of the peach into Italy.[15]

Then as now, farmers and large producers targeting the larger urban commercial markets had an interest in developing fruit varieties that ripened very early in the season or even out of season. As Pliny himself observed, greater prices were paid for out-of-season fruit.[16] The novelty of the early-ripening *duracina* peach determined its high price of 1 *denarius* apiece.[17] This kind of peach might have also kept/travelled a bit better

[11] Zohary, Hopf, and Weiss 2012, 146.

[12] At *HN* 15.113, Pliny specifies that in the *duracina*, unlike the other kinds of peaches (*ceteris*), the flesh of the fruit adheres strongly to the stone. Much later, Isidorus of Seville in his *Etymologiae* (17.7.7) names three kinds of peach, the *duracenus*, the Persian, and the Armenian. This last was, in fact, the apricot.

[13] Martial, at 13.46, seems to refer to early-ripening and costly peaches (*persica praecocia*) obtained by grafting. However, Landgren 2004, 25 understands this epigram as indicating the graft of the early-ripening apricot variety (*praecox*; it is thought that the word 'apricot' originates in this name) onto a peach; she also understands Pliny's *praecox duracina* (discussed above) as a type of apricot, not peach, an interpretation which seems to me unwarranted by Pliny's text.

[14] *HN* 15.40: *supernatia e Sabinis veniunt, popularia undique.* [15] Mazzanti Bandini *et al.* 2000.

[16] Plin. *HN* 16.118.

[17] However, note that a few lines later, in the same paragraph, Pliny gives as the past price of peaches (it is not clear whether he is talking of peaches in general or, more likely, still of the *duracina*) 30

than the other peaches: Pliny half wonders at the price the peach commands, not exceeded by any other fruit, because this is the fruit that keeps the worst, and 'the longest time that it will last after being plucked is two days, and it compels you to put in on the market' (*longissima namque decerpto bidui mora est cogitque se venumdari*). Thus, the reports indicate that peaches had a short shelf life but could be traded well – Pliny is telling us what must have been a multiplicity of practical but contradictory information. However, peaches were also versatile: later in this chapter, we will see how the delicate, highly appreciated peach stimulated experiments with various forms of preservation so they could be kept for later consumption at home and also be sent to near or distant markets.

Cultivation and Propagation of the Peach in the Agricultural Treatises

The earliest surviving discussion of cultivation *and* propagation of peach trees appears in the third-century author Gargilius Martialis. Indeed, one of the few passages of his book on horticulture that has survived, though incomplete, is chapter 2 on the peach. The sources Gargilius explicitly mentions are the otherwise unknown Curtius Iustus, Celsus, the two Quintilii, and, generically, 'the most famous Greek writers'.[18]

It is not possible to determine which of the sources Gargilius Martialis used gave details on the cultivation of the peach, but the appearance, in his list of named sources, of Celsus is of interest, as he is, among the named authors, the one chronologically closest to the arrival of the peach in Italy. Gargilius explicitly refers to the opinion of Celsus about the suitability of peach cultivation for every climate and also for 'lean' soil.[19] He writes:

> *Quolibet caelo et quamvis macro solo persicorum arborem poni Celsus exstimat. Idem tamen laetissimas fieri confidit si, remotione loci, blandimentum ceperunt.* (2.4)
>
> Celsus is of the opinion that the peach tree can be planted under every climate and in a soil as light as you like. He, however, admits that the plants become very luxuriant if, having been transplanted, they receive careful culture.

sestertii: pretiumque iam singulis triceni nummi fuere. This is equal to almost 2 *denarii* (1 *den.* = 16 *sestertii*).

[18] See Mazzini 1978 for considerations on how Gargilius Martialis alludes to his sources. He often uses generic terms of reference, such as *multi*, *sunt qui*, etc.

[19] 2.3: *quolibet caelo et quamvis macro solo persicorum arboerm poni Celsus existimat . . .*

Celsus' opinion is contrasted with Curtius Iustus' preference for cool and irrigated places (*inriguis et frigidis locis*) for peaches, and with the opinion of the Quintilii brothers, who advised warm climate and moist soil. We cannot place Curtius Iustus chronologically, an author mentioned only by Gargilius Martialis, whereas the Quintilii brothers (Sext. Quintilius Valerius Maximus and Sext. Quintilius Condianus), assassinated under the emperor Commodus in AD 182, are much later writers compared to Celsus.

Gargilius' discussion of peach propagation has a lacuna at the beginning; the preserved portion of the text starts with mentioning the sowing of (peach) stones (*ossa sererentur*) and continues with offering different opinions as to the best time of the year to do so. Also on this topic he refers explicitly to Celsus, reporting a common way of treating the peach stones before sowing them: immersing them in water for five days.[20] Gargilius reports also that some people believe the whole ripened fruits should be planted, so that the fruit flesh can act as manure (*vicem stercoris*) for the seed and its germination, and it gives indications on how to plant them (spacing between rows; depth which to place a seed, etc.).[21]

Gargilius devotes several paragraphs to discussing propagation from seed, and although he (and his sources) seem to suggest that propagation from seed was used to directly produce fruit-bearing plants, we know that these plants would not have maintained the same qualities as their parent plant.[22] Keeping desirable characteristics in a peach tree, i.e., preserving the full genetic apparatus of the parent plant, can happen only by vegetative propagation, by grafting, or by planting suckers. In modern peach cultivations, propagation from seed is used to create rootstock plants, onto which to graft the desired cultivar. The seedlings that Gargilius discusses were probably grown for the same reason, to use as rootstock in peach propagation by grafting, which he knowledgeably addresses later in his treatise.[23]

Ancient arboriculturists had experimented sufficiently with grafting to know that it was possible to graft the peach onto the almond (both plants belong to the *Rosaceae* family and to the *Prunus* genus), and Gargilius correctly states that the peach can be grafted onto peach, almond, and

[20] 2.4: *quod generaliter Celsus agi scribit, ut ossa priusquam terrae committantur, diebus quinque teneantur aquae innantia.*

[21] Garg. Mart 2.1.

[22] 2.5.98–102: *sunt qui in gastris . . . ossa disponant et adfirment quod si pertranseant, gratioris saporis et suci amplioris poma tribuantur.*

[23] Book 2, paragraph 10.

plum. In modern agriculture, a hybrid between the peach and the almond was introduced to be used as rootstock in the 1970s, revolutionizing peach cultivation, because it offers resistance to iron sclerosis caused by high concentrations of calcareous (lime) deposits, which characterize many soils in southern Italy and the Mediterranean regions.

The short shelf life of the peach could be addressed by preserving the fruit in a variety of ways.[24] Fruit preservation is discussed in the various agricultural treatises, but a detailed discussion of ways in which to preserve the peach specifically is found only in Gargilius Martialis.[25] In addition to the standard methods of fruit preservation, immersing the fruit in brine or in *oxymel*, a mixture made by boiling vinegar, honey, water, and salt[26] which, according to Gargilius, extends the fruit only until the following summer, he mentions that some people had experimented with drying the peaches. They followed a similar procedure to the one used when drying figs and, unlike the peaches preserved in must or other liquid, which were left whole, they pitted and cut the peaches in half. Gargilius, however, does not seem to approve of the final products that this method produced, because *vix in his aliquid suci inest cuius admonere inane videtur* ('needless to say, in these peaches barely any juice is left').[27] From this remark, it appears that the taste and texture the ancients sought in a peach was the juiciness that characterizes this fruit; they wanted peaches as close as possible to *fresh* peaches.

Even though this section of Gargilius' text is incomplete, it is evident that considerable attempts at finding a way of keeping peaches for longer periods and commercializing the processes had been current. He refers in particular to 'many among the ancients' who had experimented, with no great success, by applying a coating of pitch on the stalk and then immersing the fruit in *sapa* (boiled must), placing single fruits in special small *ollae* made in Sessa Aurunca, in northern Campania.[28] Such experiments, whatever their success or lack thereof, attest the complete

[24] Several fruits of the *Prunus* group were found in Roman Berenike (cherry-plum, peach, domestic plum) together with olives, apricot, and the Egyptian plum (*cordia myxa*). These fruits are believed to have been transported to the site from the Mediterranean regions of the Nile Valley in preserved form. When Cappers published her study, in 2006, only one fragment of peach stone had been found, whereas plums and cherry-plums were widely attested: Cappers 2006, 149–50.

[25] Section 2.12. Apicius 1.28 (Vehling 1977, 54) advises to preserve hard-skinned peaches by first immersing them in brine and then, after one day and having rinsed them, to place them in a vessel, sprinkle them with salt, and immerse in vinegar.

[26] Plin. *HN* 14.114; Dioscorides, *Mat. Med.* 5.14. [27] Garg. Mart. 2.12.170–1.

[28] See Chapter 6 on the role of Campania in fruit cultivation.

naturalization, by the third century AD, of what had been a new and exciting fruit introduced in early imperial times.

Peaches in Italy and Beyond

Archaeobotanical data suggest that the peach came to be cultivated in Italy sometime in the first quarter of the first century AD, possibly even earlier, in the late first century BC. As mentioned at the start of this chapter, because the various fruit trees belonging to the *Prunus* species – namely peaches, plums, almonds, cherries, and apricots – cannot be differentiated from one another on the basis of their pollen and wood, the extent of peach cultivation in Roman Italy is difficult to assess with precision. The differentiation can only be done by the pits or stones of the fruit, and in the absence of these in any quantity (indicating the handling of large numbers of the fruit in question, either through horticulture or trade), the history of their cultivation can be elusive. However, there are a few cases from Roman Italy where peach stones have been discovered in contexts that point to local cultivation.

Remains of a peach orchard were discovered in a farm investigated in the eastern *suburbium* of Pompeii, with the discovery of peach stones in the ancient field, associated with in situ tree trunks of the *Prunus* genus.[29] It is reported that the trees were planted in a *quincunx* formation (i.e., five trees arranged in a cross, with four of them forming a square/rectangle, and one in the centre), a planting arrangement mentioned in the agricultural treatises and unmistakable evidence of arboriculture. Evidence from the Vesuvian region suggests that by the Flavian era the cultivation of the peach was relatively common in Campania. Peaches appear also in various still-life paintings from the Vesuvian region, such as the two *pinakes* from the House of the Stags in Herculaneum (Figure 5.1). However, the fruit seems to have had an early diffusion particularly in Emilia Romagna, a region that is today one of its major producers; just a few decades later, peaches appear also in provincial territories, going from imported, preserved fruit to locally cultivated plants.[30] The geographic spread of this

[29] Stefani 2002, 31, but with no reference to documents in the archives of the Parco Archeologico di Pompei and no naming of the site. Ciarallo 2012, Table 1 (at p. 266), lists both peach stones and 'parts of plants' from *Prunus persica* as having been identified in Scafati, Villa Vesuvio. These two references may refer to the same site, since Scafati is to the east of Pompeii, but could also refer to two distinct sites. See also Borgongino 2006, 13, 17.

[30] E.g., see the example of Cham-Hagendorn discussed below. For finds from Emilia Romagna: Mazzanti Bandini *et al.* 2000; Sadori *et al.* 2009.

Figure 5.1 Herculaneum, House of the Stags: wall painting depicting three still lives with fruit, including branches of peaches, now in the Naples National Archaeological Museum, inv. 8645.
Photo by Luigi Spina / Electa / Mondadori Portfolio / Hulton Fine Art Collection / Getty Images.

fruit, first as plant-food import and then as locally produced fruit, tells us much about tastes, spread of dietary fashion, and circulation of new products.

The first diffusion of peaches, as locally cultivated plants, may have occurred in northern Italy in the late first century BC, followed by diffusion to other parts of Europe around the first half of the first century AD. Peach stones have been found and studied from a number of northern Italian sites. The earliest archaeobotanical evidence currently available for peaches in Italy dates to the early first century AD: charred endocarps were found in funerary contexts dating to the Augustan/Tiberian period, both at the necropolis of Angera (Varese) and Manerbio (Brescia). Several finds come from Emilia Romagna, particularly the area around the town of Mutina (mod. Modena) from contexts dated to the first century AD. We will further discuss the role this region may have had in fruit cultivation and the acclimatization of new plants in Chapter 6.

Archaeobotanical finds suggests that the peach may have been first introduced into Emilia Romagna, where the recovery of peach stones in layers of the Roman period is relatively abundant. Within this region, the earliest find of peach stones (as of the year 2000) comes from ancient Mutina and dates to *c.* AD 15–40. An overview of archaeobotanical finds pertaining to fruit from Emilia Romagna reports that peach stones have been recovered at 36 per cent of the sites examined (n =11).[31] In a more recent study of archaeobotanical evidence from northern Italy, which has examined data from 114 sites, peach is attested at 44 per cent of

[31] Mazzanti Bandini *et al.* 2000, 65.

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the sites.[32] The authors consider the peach stones discussed in their overview as fruit cultivated locally, first in the area of Modena and subsequently in the imperial period at sites in the provinces of Ravenna, Bologna, and Reggio Emilia as well. A study discussing a very large archaeobotanical dataset for Mutina has provided additional records for peach cultivation there: 118 endocarps and a number of pedicels were excavated in a channel that had been filled up with amphorae and other refuse, and then obliterated by the construction of an urban house.[33] The discovery of a number of pedicels is very significant: these are the flower-stalks of the fruit and indicate fresh fruits and local provenance, as opposed to imported peaches preserved in brine or must. The context containing these peach remains has a very good *terminus ante quem* and the layers with the peaches have been dated to the first half of the first century AD, reinforcing the idea that by the early first century AD the cultivation of the peach was well established in this region. The diffusion of the peach at a variety of site-types in the region and the recovery of hundreds of peach stones from Modena and also the villa at Russi, near Ravenna,[34] suggest that the cultivation of the peach spread quickly in the region in the early imperial period. Therefore, the introduction of peach cultivation into Italy should probably be dated to the late first century BC rather than the first century AD.

The peach may have arrived in Italy from the East following a Balkan route.[35] It has been suggested that 'a different way into Italy should be considered, across the Balkans, contrary to the path deemed possible from France'.[36] Giovanna Bosi and her co-authors mention the possibility that the peach tree followed a route across the Balkans rather than following, as most scholars have done, Pliny's testimony of a Gallic variety as denoting an importation from southern Gaul. Considering the archaeobotanical data from northern Italy, which suggests that by the early first century AD the peach was cultivated in parts of modern Emilia Romagna, I hypothesize that Pliny's Gallic variety of peach owned its name not because it had come from, or been developed in, Transalpine Gaul (modern France), but rather because it originated from Cisalpine Gaul. A crossing over the Adriatic to the eastern parts of Gallia Cisalpina is more than possible; in the first century BC/first century AD Aquileia was a thriving harbour town and major commercial gateway for goods imported

[32] Bosi *et al.* 2020, combined percentage from fig. 5, where religious sites/cemeteries have 21 per cent and inhabited sites/infrastructure 23 per cent.
[33] Sadori *et al.* 2009, 49–50; see also Mazzanti Bandini *et al.* 2000.
[34] Sadori *et al.* 2009, 49.
[35] Bosi, Corti, and Pederzoli 2017, 319; Sadori *et al.* 2009, 50.
[36] Bosi *et al.* 2017, 153.

from the eastern Mediterranean to Cisalpine Gaul and vice versa. In addition, some wealthy and prominent Romans with interests in horticulture, like Castritius, Gaius Matius, and Sextus Papinius Allenius (he had brought to Italy the jujube and azerole) whom I have discussed earlier in the book, all seem to have owned agricultural estates in the region.

As we shall see in Chapter 6, finds from parts of Cisalpine Gaul, Emilia Romagna in particular, clearly show that there was a greater variety of fruit in the first two centuries of the imperial period when compared to the earlier and later periods. These fruits, which were in all likelihood locally cultivated, include other 'exotic' species besides the peach (almond, cherry-prune, and watermelon); many are not attested at all in late antiquity, with the exception of the peach. However, whereas the size of the peach stones recovered from archaeobotanical deposits of the early imperial age, measuring up to 3 cm, indicates that they were large fruits, in late antiquity both the size and frequency of peach stones diminish. These data point to diminished intensity of fruit-tree cultivation in late antiquity, at least as far as Emilia Romagna is concerned. That the phenomenon did not occur everywhere in the late antique period in Italy is shown by finds from the Colosseum's sewers. A well-preserved waterlogged context from the Colosseum's western sewer, dated to the second half of the fourth century AD, has preserved a large number of peach stones, together with several other plant foods presumably consumed by spectators during the games.[37] Study of the size and morphology of 253 of these peach stones has shown that these peaches are the largest attested for Italy in the Roman period, thus suggesting that cultivation of the peach continued around Rome from the introduction of the plant in the early first century AD to the late empire, indicating that the public chose peaches exhibiting a progressive increase in size. The authors of the study also note that 'the contemporary presence of ovate and round stones of very different sizes suggests that during the late imperial time different varieties of peaches were cultivated' or, alternatively, that both ripe and unripe peaches, maybe cooked, were consumed.[38] It is not possible to say whether these peaches were consumed fresh and thus came from cultivations just outside of Rome, or whether they were preserved in *sapa* (must boiled down to thicken it up), brine, or *oxymel*, as mentioned by sources such as Gargilius Martialis. However, the presence of cherries and melon in the same sewer deposit may point to consumption, in summer, of fresh products. The public spectacle that took place in amphitheatres, theatres, and circuses, lasting the whole day, where

[37] Sadori *et al.* 2009, 51. [38] Sadori *et al.* 2009, 51–2.

certainly occasion for selling and consuming much food and drink on the premises. The selling and eating of fruit in such entertainment venues is documented in a well-known Latin funerary inscription, the epitaph of Caius Iulius Epaphra, fruit-seller from the Circus Maximus, who, we are told, used to have his stall right in front of the imperial box.[39]

Outside of Italy, in the Iberian Peninsula, the earliest find of peaches also dates to the first century AD and comes from Lleida in Catalonia.[40] Evidence for peaches, possibly dating to the first century AD,[41] has also been recovered from the northern port city of Oiasso (mod. Irun) on the Bay of Biscay, in the Basque Country. In a review of luxury foods introduced into Central Europe in Roman times, the peach was found at five sites in levels dating to *before* AD 50 and at fifteen sites in levels dating to the next half-century.[42] It appears that the taste for peaches spread quickly to other parts of the western Mediterranean once the plant had reached the Italian peninsula, and perhaps the cultivation too. There is indeed a caveat to this history of peaches in Roman cultivation: the recovery of peach stones does not automatically mean that the fruit was cultivated locally. Latin sources discuss ways to preserve the peach, and they specify that, in the case of liquid storage, the fruit was preserved whole, without removing the stone.[43] As mentioned earlier when discussing the testimony preserved in Gargilius Martialis, experiments in pitting and drying peaches came late and this form of storage does not seem to have become popular, because what was appreciated in this fruit was its juiciness. So, somewhat counterintuitively for modern westerners used to either sliced dried peaches, canned chunks in syrup, or peach jam,[44] a peach stone does not imply the consumption of a fresh peach and therefore its local cultivation; the fruit could have arrived whole – in preserved form – in amphorae. An example of this is the amphora discovered at the harbour of Aquileia, which contained 162 peach stones. The amphora, of which only the bottom part was recovered, cannot be more precisely classified, but it seems to have been a wine amphora, and it was found in association with other archaeological material dated to the second century AD.[45]

[39] *CIL* 6.9822. [40] As reported by Sadori *et al.* 2009; cf. also Ravotto et al. 2016, 166.
[41] Peña-Chocarro and Zapata 2005. [42] Bakels and Jacomet 2003.
[43] E.g., see Garg. Mart. 2.12; Apicius 1.28.
[44] Van der Veen 2011, 155 observes that today in the East peaches, together with the fruit of other *Prunus* species, are also regularly traded as dried fruits with the stones still enclosed.
[45] Castelletti 1973–4; I would like to thank Dr Lanfredo Castelletti for sending me a scan of this article of his, which was not available in UK libraries. The nature of the other archaeological material was not specified.

However, if an archaeological site has hundreds of peach stones *and* evidence for pollen and wood of plants of the *Prunus* family (as mentioned, both pollen and wood, such as root-wood, for this family can be identified only at genus level), then local cultivation of the peach is extremely likely. This is the case of the discoveries at Cham-Hagendorn in northern Roman Helvetia, where, in the context of the Roman settlement, evidence strongly suggesting the cultivation of at least one peach tree has been found in the Gropenmoos area. Excavations in this area discovered a well-preserved Roman water mill with multiple water wheels, a metalworking workshop, and a sanctuary; the occupation of the site ranged from the late first century AD to the late second century AD.[46] The installations were by a stream, which was probably the same as the one that still drains the area and flows into the River Lorze. The sanctuary, built around AD 200, stood on an island between the stream and an arm of the River Lorze, and it is there that the archaeobotanical evidence pertaining to the peach was excavated: 470 peach stones, in addition to wood and pollen belonging to the *Prunus* species, prompting the excavators to consider the Cham-Hagendorn discoveries as the earliest evidence for Roman cultivation of the peach north of the Alps.[47]

An Ancient 'Peach Farm' at Rome's Doorstep

Until recently, the changes that I argue horticulture underwent starting in the Augustan era and continuing throughout the Julio-Claudian period could only be appreciated on the basis of the information and discussions found in the literary texts. But a few years ago, major excavations in Rome in conjunction with the construction of a new metro line revealed a farm and very large commercial orchard, dating to the reign of Tiberius. The 'peach farm' of S. Giovanni in Laterano (as it has been called) is a significant archaeological document that supports my contention and periodization of Roman arboriculture in early imperial Italy.

During the engineering works to build a new line of Rome's underground urban train (Metro C), remains of very substantial water-management structures and of an area devoted to horticultural use were

[46] This synthetic information about the discoveries comes from the webpage of the University of Bern (https://boris.unibe.ch/52609, accessed 22 October 2018), describing the content of the publication of the excavations: Schucany and Winet 2014. I was unable to access this publication, with the exception of the chapter on the archaeobotanical finds (see next footnote).

[47] Vandorpe and Wick 2014; I am very grateful to Patricia Vandorpe for sending me a copy of this chapter.

identified in the modern area of S. Giovanni in Laterano.[48] The area investigated by archaeologists was at a depth of 15.5 m below modern surface level. Although the investigations were constrained by the limits of the Metro building yards, the remains discovered are tantalizing: an agricultural establishment of commercial size, featuring irrigation devices, located just outside the line of the later Aurelianic city wall, and at least in part devoted to the cultivation of peaches together with other more common fruit. This area in antiquity was a valley next to a river, still attested in the eighteenth century and identified with the Aqua Crabra mentioned in Latin literary texts, and other minor watercourses.

The most important finds of this discovery, which is awaiting full publication,[49] include a large reservoir, lined in waterproof *opus signinum*, excavated only in part (it continued beyond the area opened for the new station). The exposed area of the reservoir measured a very impressive 69 × 34 m and, if its minimum recorded depth of 1.75 m is used as a multiplier, it held some 4,105,500 litres of water.[50] There is evidence for a water wheel, which was driven by water from two long parallel terracotta pipelines, and presumably delivered water to the reservoir: we can assume that it was part of a system of water wheels and/or a combination of canals and pipelines irrigating the agricultural area from the nearby river. A *c*.75 m long masonry channel distributed the water from the reservoir to the cultivated area. In addition, the excavations have identified a road, running parallel to an *opus reticulatum* wall, 100 m long and 4 m wide, as well as measures to drain the cultivated area of excessive water.[51] The width of this road, which seems to have given access to the farm, allowing two wagons

[48] Investigations occurred in Via Altamura (portion to the south of Largo Brindisi), Largo Brindisi, and the area to be occupied by the metro station proper (delimited by Piazzale Appio, Largo Brindisi, Via Altamura, and Via La Spezia). Since the archaeological investigations were linked to the engineering works, they have occurred over several years, starting in 1999. At the time of writing, only two publications on these discoveries have appeared: Rea 2011, a scientific report in the online journal of the Italian Ministry of Cultural Heritage, accounting for discoveries made in the period 1999–2011; and Rea 2016, a short article for the general public in the French popular magazine *Dossiers d'Archéologie*, which includes the new discoveries made in the area of the new S. Giovanni metro station between 2011 and 2015/16 (this includes the huge reservoir). Due to the different nature of the two publications (in Rea 2016 obviously no elevations and numbered stratigraphic sequences are given) it is not always easy to reconcile the phases and dating identified.

[49] For preliminary reports, see Rea 2011; Rea 2016. Some of the finds from this excavation are on display at the new S. Giovanni in Laterano station of the Metro C.

[50] Since no corner of the pool was identified, estimates of its full size are not possible; the maximum depth of the reservoir was between 1.75 and 2 m.

[51] Both in the excavations carried out at Largo Brindisi and at the 'Corpo 3' of the S. Giovanni station, a drainage channel made with amphorae (Dressel 21–2; Dressel 6 A) was identified abutting a masonry channel (bringing water to the reservoir?) dated to the Augustan age and this has been

proceeding in opposite directions to pass, suggests the frequency of wheeled traffic generated by the needs of the farm. What was cultivated is represented by four agricultural trenches oriented east–west, some of which presented, in situ, the roots of trees. In the fill of one of these trenches many peach stones were found (the find has not been quantified in the preliminary publications); finally, seven tree stumps belonging to plants of the genus *Prunus* were uncovered.[52] The excavators considered the irrigation system to be stratigraphically related to the cultivation trenches uncovered and the peach stones to be connected to the *Prunus* stumps. Both the 3D digital reconstructions of the site that have appeared in the 2016 publication and the installation curated by the Soprintendenza Archeologica di Roma in the new S. Giovanni in Laterano metro station presenting the discoveries emphasize that the drainage and irrigation systems were in function of the cultivated horizons discovered and that peaches were one of the cultivars grown on this suburban commercial orchard in the early Julio-Claudian era. That part of this farm was devoted to the propagation of plants by layering is suggested by the discovery of at least 25 *ollae perforatae*.[53]

The chronology of the various buildings and building phases in the area appears to start in the mid third century BC with a structure in tufa defining the riverbank and acting as a raised walkway beside cultivated fields. In the early first century AD, this structure was reused in the construction of the reservoir and its connected canalizations; then in the late first century AD/early second century, the reservoir and its apparatus seem to have been abandoned. Still, agricultural cultivation continued in this area: above the first-century AD cultivation fields and complex irrigation/water-management structures, a 60 cm thick alluvial deposit was identified, which in turn was covered by a man-made fill which raised the ground level by *c.*1.5 m. This level, with a series of linear shallow tranches presumably used for the cultivation of vegetables rather than for fruit trees,[54] has been dated to the first half of the third century AD and seems to have been in use until the construction of the Aurelianic Wall.[55]

interpreted as a solution suitable for a fruit orchard, since too much water can damage the trees: Rea 2011, 9, 16.

[52] Rea 2011, 30; Rea 2016, 50. It is not clear from the publication whether these tree stumps are the same '*apparati radicali*' found in one of the agricultural trenches mentioned in the 2011 publication as awaiting study or, in fact, a new find.

[53] The *ollae* are not mentioned in the preliminary publications, but they are (with specimens on display) in the installation at the S. Giovanni in Laterano metro station.

[54] Rea (2011, 11) gives the average width of these trenches (concave profile) as 0.6 m and the depth as being in between 0.3 and 0.5 m.

[55] Rea 2011, 11.

The date for the major works identified in the fruit farm (the reservoir, the irrigation channels, the road, etc.),[56] as indicated in the 2016 preliminary publication and in the installation at the metro station, is the reign of Tiberius (AD 14–37). During this phase, the cultivation area was divided into two distinct sections by a wall in *opus reticulatum*. Rossella Rea, who has directed the archaeological investigations, hypothesizes that the apparent abandonment of this commercial farm in the second century AD may relate to Frontinus' decision, while appointed *curator aquarum* or director of Rome's water supply in the last years of the first century AD, to stop the flow of the Aqua Crabra towards Rome in order to use it exclusively for the supply of the Tusculum area.[57]

For our purposes, this fruit farm with its installations and use in the early imperial period brings together many aspects of arboriculture that have been missing from the historical record. The finds from S. Giovanni in Laterano show a considerable farm devoted to arboriculture where substantial capital investment was made in creating permanent infrastructure in order to improve productivity and assure viability over time. Rea estimates that the size of the agricultural *fundus* investigated was *c.*6.5 *iugera* or about 16,380 m² (*c.*1.6 h; *c.*4 acres); the area archaeologically investigated measures *c.*14,000 m².[58] Cultivation of vegetables among the fruit trees in this first-century AD phase cannot be excluded, but certainly figs and apples grew on part of this agricultural land[59] – 'staple' fruit destined for sale – together with the more recent peach, which probably sold well in Rome due to its relative novelty. As mentioned, Pliny tells us that peaches were famously fragile and could last only two days after being picked from the tree, being a *non aliud fugacius* fruit.[60] This made peaches most suitable for being grown just outside Rome's city wall, whence they could be readily brought to market. The archaeological discovery at S. Giovanni in Laterano attesting the likely cultivation of the peach, together with the clearer evidence from Mutina I have discussed earlier, suggest that the introduction of peach cultivation into Italy should be

[56] There is no reason to believe that the only plant cultivated on this farm was peaches; a mixture of fruit trees and different seasonal vegetables seems the most likely combination.

[57] Rea 2016, 51; cf. Front. *Aq.* 1.9. [58] Rea 2016, 49, 51.

[59] In the excavation in Via Altamura, along a late Republican *opus reticulatum* wall, tree roots belonging to the *pomaceae* family, which includes apple, quince, and pear, have been found: Rea 2011, 28. In Rea 2016, 50 she mentions that besides peaches, the orchard also featured grape vine and fig; evidence for walnut may rather be related to timber (so presumably they found walnut wood): '*Dans le verger se trouvaient aussi des figuiers, des plantations des vigne et le noyer, ce dernier ayant peut-être été utilisé en tant que bois de construction.*'

[60] Plin. *HN* 15.40.

placed at least a generation earlier (quite possibly much more) than has been generally done so far: up to now, the arrival of the peach in Italy has taken Pliny's comment about the early-ripening *duracina* variety as the chronological marker for its introduction into Italy (therefore in the AD 50s).[61] The evidence suggesting peach cultivation at S. Giovanni in Laterano also reminds us that the surviving written record can offer only partial information on issues such as the diffusion of new plants and their cultivation. Years ago, in his study on fruit cultivation in the works of the agronomists, Alberto De Angelis remarked that the cultivation of the peach struggled to take off throughout the first century AD due to the high cost and bad reputation of the fruit and that, until the second century AD, when he thought large-scale cultivation began in Italy, there was inadequate technical knowledge of the cultivation of this tree.[62] De Angelis' study was text-based, and he noted that the agricultural writers report only 'second hand' information until the Antonine period and that, in Apicius' cookbook, there were only two recipes for the peach. Thus, he concluded that the peach had very limited diffusion in the first century AD.[63] Archaeology prompted by modern urban necessity has contributed a counter-narrative in the historical landscape of Italy.

The Pompeian evidence for commercial gardens offers a term of reference for the large orchard of Rome and the basis for some hypotheses about the total number of trees that might have been grown in the S. Giovanni in Laterano farm. The fruit orchard/market garden located between Porta Stabia and Porta Nocera in Pompeii (I.22.2), which Jashemski investigated in 1974, gives a comparison for the layout and intensity of planting. Although earlier excavations had disturbed the orchard area and the original soil contours could not be recovered, Jashemski did find *c.*150 root cavities in an area equal to about 50 per cent of the original garden (measuring *c.*35 × 60 m = 2,100 m^2, or *c.* one-fifth of a hectare; half an acre), as it was not possible to excavate the rest.[64] No archaeobotanical macro-remains and no charred wood were found, probably due to the earlier excavations which had paid no attention to

[61] As mentioned above, Mazzanti Bandini *et al.* 2000, on the basis of archaeological evidence, suggested the late first century BC.

[62] De Angelis 1995, 75.

[63] Considering the nature of the peach and the apparent preference of the ancients for enjoying the juiciness of this fruit (see Garg. Mart. 2.12.170–1), determining its diffusion on the basis of recipes of cooked food in Apicius does not seem the best criterion. It is also not clear why Pliny's mention of several varieties of peach clearly circulating in Italy ('the "common peach" is found everywhere', he writes at *HN* 15.40) is ignored by De Angelis in his evaluation.

[64] Jashemski 1979–93, vol. I, 251–3.

finds of this kind, but the dimension of the root cavities suggested that about 90 per cent of the trees planted in this orchard were small and Jashemski compared this datum with modern orchards in the Pompeii area which also feature small and nearly uniform trees.[65] The trees were planted in rows, not perfectly aligned, and the spacing between them was between 2 and 3 m, a little less than the spacing recommended by Columella for fruit trees. Columella recommended to plant fruit trees every 3–4 m apart, so that there would be sufficient space for the crown of mature trees and for other crops to be planted underneath them.[66] If the unexcavated part of this Pompeian orchard presented the same planting pattern as the excavated portion, a total of 300 fruit trees can be posited. Two large clusters of root cavities in the southeast corner of the orchard belonged to clusters of small trees, possibly hazelnuts with suckers.[67] The garden also had a water cistern for irrigation placed in front of the north wall of the orchard for easy access. The types of tree that grew in the Pompeian orchard cannot be determined, but they probably consisted of different types of fruit tree.

The Pompeian orchard, when compared to the one recently discovered in Rome, was considerably smaller (about 2,000 m^2 versus a suggested 16,000 m^2) and, although basic provisions for irrigation were present, it did not have the same sophisticated irrigation (and drainage) infrastructure as the one in Rome. If one assumes that a planting pattern similar to the one from Pompeii was followed in Rome's commercial orchard, and we hypothesize that out of the estimated *c.*16,000 m^2 making the estate, 10,500 m^2 were available for planting trees, we would have a property with at least 1,500 trees.[68] Whereas at Pompeii Jashemski could postulate that water could have been carried by hand to the young trees, the finds from Rome (even in their incomplete investigated state) show that investment in a complex irrigation system was deemed necessary to manage the more than 1,000 trees I have hypothesized the property had. Fruit trees are fussy. As every farmer knows, irrigation is crucial at specific points in time, but excessive watering or watering at the wrong time may have

[65] Jashemski 1979–93, vol. 1, 253. Three large trees were around a masonry *triclinium* located in the orchard; one of these trees was identified as a *c.*50-year-old olive.

[66] Jashemski 2018a, 140; Columella, *Rust.* 5.10.15.

[67] Jashemski 2018a, 141; see also Jashemski 1979–93, vol. 1, 261: similar root cavities were identified in the House of the Ship Europa, and carbonized hazelnuts were subsequently found in close proximity, thus apparently confirming the identification of the plants.

[68] The total area occupied by the large reservoir is not known, as only part of two sides measuring 69 × 34 m was excavated. I have in this calculation allocated to it 5,500 m^2 and considered an available area for planting of 10,500 m^2.

negative effects, and the written texts mention this, as for instance when Gargilius Martialis, quoting the Quintilii brothers, observes that *frequens umor enormi vastitate et inani sapore distendat* (2.4.83–4: 'abundant watering disproportionately enlarges the fruits and makes them tasteless').

Since fruit trees on average take a minimum of four years before they start to bear fruit,[69] large-scale cultivation of fruit (as opposed to a few fruit trees in a garden or in small vineyards, as often found at Pompeii) appears only when there is adequate demand for the product and there are individuals who can afford the initial investment in capital and labour. The very presence of the emperor, who had access to huge financial resources, large numbers of slaves and freedmen, and who owned many properties, could have been a determining factor in allowing the development of large-scale production facilities in the outskirts of Rome. There were other profitable businesses, in imperial ownership or private, that required considerable financial outlay to build infrastructure guaranteeing large and steady water supply. The remarkable *fullonica* (a textile-washing and bleaching facility) or maybe a tannery, discovered at Casal Bertone, is an example. This impressive industrial complex, comprising at least ninety stalls with treading tubs and complex water-management installations, is the largest *fullonica*/tannery currently known in the Roman world and was part of an estate which included an elegant villa, a mausoleum, and a necropolis. This whole property seems to have belonged to the imperial *fiscus* when the industrial structure was installed.[70] The commercial orchard of S. Giovanni in Laterano could equally have been an imperial property or the property of some other very wealthy individual, but whether it was owned by the emperor or not, its existence is unmistakable evidence of a centralized, large-scale fruit production in the outskirts of Rome in the early Julio-Claudian years. Whoever the owner was, he had been ready to invest in infrastructure and technology (the water wheel; the water pipes and canalization; the large road) and, it seems, to add, alongside long-established types of fruit, a novel fruit like the peach, anticipating the demand of the market and the good price fresh peaches might fetch.

[69] Modern averages for fruit bearing are: apple, 3–4 years; pear, plum, and cherry, 4 years; peach, 2–4 years.

[70] This remarkable discovery has not been fully published. Preliminary accounts can be found in Caspio and Musco 2011 (a very brief note on a symposium) and Musco *et al.* 2008. Presentations of both the archeological finds and the anthropological studies on the human remains from the necropolis and mausoleum were given at a workshop held at the Swedish Institute in Rome in autumn 2016, which I was fortunate to attend.

The dating of the fruit farm and its infrastructure at S. Giovanni in Laterano (not the small-scale agricultural production attested for the third century AD) in the reign of Tiberius is highly significant. Since the reign of Augustus and continuing through the first century AD, intellectuals and members of the upper strata of society busied themselves writing treatises on horticulture: knowledge of plants prompted investment by owners of land. Many elements incubated these literary and agricultural activities: the end of the civil wars and the period of political stability that followed cannot be underestimated. Disruption in patterns of land ownership, damage to fields and plantations, scarcity of labour, and disruption of established supply-and-demand networks are the major consequences of every conflict. When the situation returned to normal (or perhaps became even better than before), it must have truly felt as if Saturn's mythical 'Golden Age' had returned, as sung in contemporary Augustan poetry.[71] Second, the demographic growth experienced by Rome was, for horticultural activity in the *suburbium*, an important factor: growing demand for foodstuffs in general prompted increased production and favoured specialization and innovation. Lastly, social stratification and competition in the capital and the high concentration of wealthy individuals engaged in competitive display fuelled the demand for quality products and novelties, in food as well as in fashion, décor, and architecture.

As seen from the discussion above, the peach is both the result of a certain natural history and an exemplar of horticultural manipulation. Peaches, famous then and now for their deliciousness, had a long history. Like many other fruits, the peach too made a long journey from East to West, but its diffusion in Italy and various western provinces in the early decades of the first century AD is, in many ways, unusual. Once it had reached Italy, the peach spread fast and almost simultaneously to the other side of the Alps, if not in the orchards as a cultivated plant, at least on the tables as a preserved, imported fruit. The speed of this diffusion (at least in horticultural terms) and the changes in the dietary habits of part of the population in the provinces were the result of increased trade connectivity and geographic mobility of provincial administrators, soldiers, traders, and local elites advancing their position in the Roman system.

The horticultural skills I have discussed in the previous chapter were deployed to the peach too, with both prestige and market consideration in mind as suggested by one of Martial's epigrams:

[71] E.g., Ov. *Met.* 1.89–113; Verg. *Ecl.* 4.

> *Vilia maternis fueramus Persica ramis:*
> *nunc in adoptivis Persica cara sumus.*
> (Mart. 13.46)
>
> On our mother's branches we had been peaches of little worth; now, on adoptive boughs [i.e., on grafted branches], we are peaches of price. (trans. Shackleton Bailey, Loeb edn)[72]

Within this horticultural story, the archaeological discoveries made during the Metro C works for the S. Giovanni in Laterano station occupy a very important chapter. This large Tiberian commercial orchard, with its complex infrastructure and type of fruit cultivated, has confirmed my views of the importance of the changes that occurred in horticulture during the reign of Augustus and his immediate successors: increase in scale of cultivation, degree of capital investment in permanent infrastructure, and response to specific market demands. The metropolis of Rome and the super-rich clientele that lived there were certainly catalyst for a range of changes and advancement in horticultural practices, but not everything of note in this sector occurred *in suburbio.* Two regions of Roman Italy seem to have played a significant role not only in the cultivation of fruits and vegetables, but also in acclimatizing new plants and in selecting new cultivars: Campania and Gallia Cisalpina. As examined in the next chapter, literary evidence is supplemented by archaeobotanical data to give us a suggestive picture of the role this sector of agriculture had in these regions in Roman times.

[72] Commentators disagree on the exact type of graft; according to Steier, *RE* XIX.1.1025, it was possibly a graft of a peach on a superior kind of peach. A note to the Loeb's text reports Friedländer's suggestion that these were peaches grafted on an apricot tree. Cf. Calp. 2.42, about peaches grafted on plum trees.