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New and Old in the Ptolemaic Fayyum

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WHEN, SHORTLY AFTER THE Roman conquest, the geographer Strabo made a visit to the Fayyum he described the area as follows:[1]

> This nome is the most remarkable of all in its appearance, its fertility, and the way it has been developed. It is planted with olives and is the only area to grow large, fully grown olive-trees which bear a fine crop; and if the crop were collected in carefully it would produce good oil too... And it produces plenty of wine, and grain, pulses and many other kinds of crops.

With olive, vines, cereals, and pulse, the produce of the area was a familiar one to a Greek or Roman who visited. But how recent was this for the Fayyum, and how typical of the area is the picture of the agricultural landscape preserved in Strabo's thumb-nail sketch? What I want to do in the following pages is to look at the impact on the agricultural scene of the Fayyum of the Graeco-Macedonian conquest, to identify some of the agricultural innovations that followed its development under the early Ptolemies and, in asking how far Greek culture may be found reflected in agriculture, to evaluate the impact of Greek settlement on the area in this particular respect. Agriculture therefore is the slant; the wider focus is the effect of conquest on land usage and agricultural exploitation.

The first point that must be made is to stress the atypicality of the Fayyum. In any historical consideration of agriculture both physical and social aspects arise. On the one side there is the nature of the terrain (the soil, its drainage, the overall lie of the land), natural resources (such as water and, in Egypt, the supply of Nile silt to enrich the soil), climatological features (the length of

[1] Strabo XVII 1. 35; his comments on the poor local management of the olive harvest are not atypical.

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the growing period, the absence or presence of rain, of frost, or shrivelling heat) and, particularly in the case of Egypt, the rhythm of the annual flood of the Nile; on the other side, the effect of man on the landscape forms an important part of the picture, how the soil is exploited and worked, how natural resources are managed, the different forms of land-tenure, the different demands for crops, and the organisation of markets will all have an impact on the agricultural scene. For the Fayyum, as for elsewhere, both are important but in the early Ptolemaic period there was human impact on the natural scene on a scale unparalleled since the Twelfth Dynasty, when Amenemhet III had first begun to organise the province in the second half of the nineteenth century BCE. And in any discussion of agriculture it is the huge drainage and reclamation works in the area under the early Ptolemies that must be mentioned first. It was these that made possible both an extensification and intensification of agriculture in the area; it is the scale of these that above all else makes the agricultural development of the Fayyum atypical.[2]

The reclamation of the Fayyum must have started early in the Ptolemaic period.[3] Butzer suggests that under the Ptolemies the area under cultivation was trebled to 1,300 km^2, a figure similar to that of 1882.[4] The map, however, from 1912 that Willcocks and Craig append to their third edition of *Egyptian Irrigation* (1913) shows a somewhat smaller area for the province, with no major canals like the Polemon and desert canals of the third century BCE running south of the Gharaq basin (see Map 2).[5] It may well be the case then that there was even more land under cultivation in the Ptolemaic period than in any period since, and the circle of ruined Graeco-Roman villages that now surrounds the Fayyum stands testimony to the scale of Ptolemaic expansion in the area. The actual process of reclamation and its relation to the Fayyum lake—the 'Moerisfrage' which, ever since Herodotus, has fascinated and entrapped later irrigation engineers as well as Egyptologists—need not concern us here, though I would, in parenthesis, like to stress that an understanding of the course of the Nile and the configuration of the canals outside the Fayyum is a necessary precondition to assessing the degree to which the inflow was controlled by an enlarged barrage and dyke at El-Lahun.[6] Both geological and hydrological studies are essential for understanding the process that is illustrated in the documents.[7] The construction or enlargement of the canal system of the area was combined with widespread drainage, clearance, and reclamation, with the drying out of previously marshy areas, the washing of salt from the soils, and the provision of water

[2] On the atypicality of the area, see Manning, above, pp. 84–6.
[3] See above, ch. 5.
[4] Butzer (1976), 47.
[5] Willcocks and Craig (1913).
[6] For modifications in the course of the Bahr Yusuf, see Butzer (1959).
[7] Butzer (1959), 225, on differing rates of sedimentation; Crawford (1973), 224–5, more generally.

to areas that were as yet without it. These are activities which are all well-documented in the early papyri.

The fact that in the reign of Ptolemy I papyri (the waste paper of the local bureaucracy) were not yet recycled as mummy casing (known as cartonnage) limits what we know of the first Ptolemaic work in the province, but when this recycling gets under way and our documentation increases what we find is an active programme of reclamation, constant work on dykes both new and old, large herds of pigs introduced to root out the undergrowth on newly drained land, new agricultural experimentation as land was brought under cultivation for the first time, and an active group of immigrants involved in getting things going.[8] New towns and villages were settled, often with population from elsewhere in the country. The changing administrative arrangements, as nomarchies gave way to toparchies, are just one reflection of the intensity of development in the province. So too, in the early third century BCE, the Fayyum's name was changed from The Marsh (*Limne* in Greek) to the Arsinoite nome, named now after Queen Arsinoe, the sister–wife of Ptolemy II Philadelphos.[9]

For all this early activity three groups of papyri are of particular importance — the cartonnage excavated by W. M. Flinders Petrie at Gurob in 1889–90 (later published by the Royal Irish Academy in Dublin as the Petrie Papyri), that excavated by the French (P. Jouguet) at Ghoran in 1900–1 (published as the Lille and Sorbonne Papyri), and, thirdly, the Zenon Archive, which consists of papyri which were not preserved as cartonnage but rather represent a group of official and personal papers of one Zenon, from Caunos in Caria, who worked as estate-manager for Apollonios, the minister for economic affairs of Ptolemy II. The Zenon Papyri were not officially excavated but they reached the antiquities market at the start of the First World War and are now scattered amongst the collections of many museums in Cairo, Europe, and North America. The archive clearly derives from the eastern part of the Fayyum, from the new town of Philadelphia at Darb Girza where Apollonios' estate was centred (see Map 2). Apollonios, the minister, and his estate-manager Zenon, will figure often in the following pages.[10] Victims of the hazard of discovery, we exploit what survives as we try to answer the questions we pose. Many more papyri, surviving from this period from these and other collections, still lie in museums unpublished; many aspects of the subject may yet be further illumined.

A further important source of information is archaeology, both the more traditional excavation and survey archaeology, which can provide a more general picture of land use over broader areas and, when combined with selective

[8] Westermann (1917), (1919), (1920), (1922); Thompson, above, ch. 5.

[9] Still called The Marsh in the so-called Revenue Laws of Ptolemy Philadelphos of 259 BCE, *P.Rev.* 31. 12; 69. 2; 71. 5; 72. 12.

[10] For an overview of the Zenon Archive, see *P.L.Bat.* 21; Rostovtzeff (1922), Préaux (1947), Orrieux (1983), (1985), Clarysse and Vandorpe (1995), for studies based on the archive.

sampling of various kinds — seeds and grains, nuts, pollen identified in excavated sites or through core samples from land and lake — can provide important results which may be checked against the documents.[11] So, at Karanis in the north-eastern Fayyum the University of Michigan excavators in 1924–9 pioneered the analysis of seeds, pips, and stones to show a varied agricultural landscape for this settlement under the Romans with a wide variety of fruit and nut trees (date, fig, hazelnut, walnut, pine, olive, peach, Indian medlar, quince, pistachio) and of crops (radish, lotus, lentils, barley, and wheat) that grew in the vicinity.[12] More recently, core samples from Lake Moeris have revealed the possibilities of pollen analysis; it appears, for instance, from this record, that after 1930 olives once again grew in abundance in the area. Further sampling of this kind will doubtless fill out the picture. Meanwhile the field is open and to date it is still the documents which provide our main evidence for the Ptolemaic period.

Before moving on, however, to discuss what it is that these documents show we may also note as relevant to the historical study of agriculture — as to so much else — the important work of Napoleon's scholars. The careful collection of regional details and the observations of Girard recorded in his *Mémoire* make the *Description de l'Égypte* an invaluable source for understanding Egyptian agriculture. And whereas information on some, more recent, crops (such as sugar, cotton, and indigo) may be ignored, the timing and production figures of other forms of cultivation are still a useful source of comparison. From this study of Girard, for instance, who travelled throughout the country, visiting the Fayyum from 17 May to 23 June 1800, we know that the three main seasons of the year in use in demotic Egyptian texts of the Ptolemaic period coincided with the three major types of crop cultivation in Egypt. The effects within a basin system of agriculture of different irrigation machines were carefully studied — one ox used in water-raising replaced the work of five men — and the different seed requirements for different crops recorded. Lentils, for instance, might be scattered directly on the mud recently left by the flood-waters, at a sowing rate of 1/3-2/3 *artab* to a *feddan*; covered by the operation of a plank dragged over the field, they were harvested approximately four months later, plucked out individually when grown with other crops or, as in the Fayyum where lentils were grown as a single, unmixed, crop, cut down with a sickle. To harvest a feddan required nine to ten days' work. Transported to the threshing floor in bundles, the red lentils of Egypt were here separated out like other grains; four men and four oxen would process the produce of a feddan in a day. The lentil stems then served as fodder for camels and goats; the grains were taken to

[11] Kirby and Rathbone (1996) with Rathbone (1996), on survey archaeology; Mehringer, Petersen and Hassan (1979), on core samples and pollen analysis.
[12] Boak (1933), 87–8.

market.[13] It is this degree of detailed record that can bring to life the inundation agriculture of Egypt before the High Dam was built.

For investigating the immigrant impact on Egyptian agriculture under the Ptolemies we may start with the different forms of cultivation found in different locations. First, there was the traditional basin agriculture of the central Fayyum and those areas, serviced by the new canal system, which were reached by the annual flood, which soaked the land when the river rose each year and deposited the silt; here annual subsistence crops were grown—food for man and animal alike. Second, there were those areas where perennial cultivation was possible, in lands lying close to canals where water could be lifted all the year round, with the use of *shaduf* or *saqia*; here orchards and vineyards were set, interspersed no doubt with annual crops.[14] It was here, in particular, that the effect of innovation was doubly important, in respect both of new crops introduced and the technological advances in raising of water.[15] The two basic agricultural regimes were differentiated also in the way that rents and taxes were charged. On food crops in the fields in the big basins, the *perichomata* as they are called in the papyri (lands with surrounding dykes), rent came in kind, in wheat or wheat equivalent. For orchards and vineyards in contrast it was a tax in cash that was charged. This is where investment was needed, since this type of planting could not provide an immediate yield but needed immigrant capital. These two basic types of cultivation may be differentiated according also to the people involved. In terms of exploitation, the picture is two-fold—on the one hand, there is the agriculture of the traditional peasants (the *fellahin*) and, on the other, that of the new settlers (the immigrants and settled soldiers from mainland Greece, the Aegean islands, and Asia Minor) who brought with them new techniques, crops, and (sometimes) expertise.

Such a broad-brush picture is, of course, somewhat over-simple. As already noted, traditional crops might also be grown within the orchards and vineyards, and many of the settlers were involved in basin agriculture as well as with these cash crops. Apollonios and Zenon, the minister and his estate-manager, themselves provide striking examples of these new settlers actively involved in several forms of agriculture. And it was not only orchards and vineyards that were new; many new crops were also grown on basin land. Nevertheless, as a basic characterisation of two major types of cultivation and two different management regimes, in terms both of rents and taxes and of the personnel involved, I think that this distinction will stand. At least it provides a framework in which to discuss the more detailed evidence of the Ptolemaic papyri.

[13] Girard (1813), 492–5, his visit, 499–502, crops and irrigation, 527–8, lentils; the study is of equal interest for the tensions among different population groups in the Egyptian countryside.

[14] For a cistern and spring providing water for orchards and vineyards, see *P.L.Bat.* 25, 21. 7 (78 BCE); for an earlier period, Eyre (1994), 57–80.

[15] See Bonneau (1993), 97–8, 106–7; Eyre (1994), 80, on the importance of technical improvement.

This is a discussion of new and old, and I shall start with the new. What I want to consider here is how far what has been called the 'Mediterranean triad' of crops—that is, cereals, olives and vines—affected the traditional pattern of agriculture in the Ptolemaic Fayyum. What changes may be traced in the agriculture as a result of Greek settlement in the area following Alexander's conquest? Through looking at this triad (interpreted in its broadest sense) we may begin to gauge the changes that took place.

First of the triad come the cereals, and this category I propose to extend to include the basic subsistence crops, which formed the main basin crops of the Fayyum. These were the regular crops, well-known from pre-Ptolemaic Egypt—the cereals and the leguminous crops that were grown for food, together with hay and green crops cultivated as fodder for farm and transport animals. As I have suggested elsewhere, it is in cereal crops that the most important change may be found—the change from emmer to durum wheat that occurs in this period.[16] This is a change that can be traced in the archaeological record,[17] as well as in documentary sources.

In pre-Ptolemaic Egypt the main grains were emmer and barley. Both grains were used for beer, but the main cereal of Egypt before the Ptolemies was the husked emmer wheat known as *olyra*, which was pounded with stone pestles and mortars to break down the grain and then cooked either as groats (*chondros*) in the form of porridge or made into bread.[18] Herodotus had commented on this grain when he visited Egypt in the fifth century BCE (II.77.4): 'They eat bread made from olyra-grains which they call *kyllestis*. And the "wine" that they use is made from grains of barley, for there are no vines in their country.'

Olyra continued to be cultivated on the arrival of the new Greek settlers. Following Alexander's conquest, however, an important and progressively significant change took place, as the Greeks introduced to the country the grain that they called *sitos*, most probably the naked tetraploid hard wheat (*Triticum durum*) that was regularly grown in Greece. Olyra now became 'old-fashioned wheat'[19] and, following Greek preference, the new immigrant wheat was in time adopted throughout the country.[20] That in the Fayyum this change was already significant in the third century BCE is probably a reflection both of the immigrant element in the area and the extension of the cultivable land that took place in that period.

[16] Thompson (1984), 368–9; cf. Sallares (1991), 370–2, on types of grain; Lewis (1994), 138–9, does not distinguish between husked emmer (*triticum dicoccum*) and the naked wheat grown in Egypt (probably *triticum durum*).

[17] Dixon (1969).

[18] See Moritz (1958), xix–xxii, on the problem of freeing the edible grain from its husk; Thompson (1995), on porridge.

[19] *SB* V 8243. 3 (3rd century BCE), *palaios sitos*; *P.Sorbonne* I 29. [5] (251–250 BCE), *pyros palaios*; it is possible, however, that the reference is to last year's grain, cf. *krithe palaia* (barley), *P.Sorbonne* 23. 4–5 (251 BCE).

[20] Schnebel (1925), 97.

Already in 235 BCE, in a crop report that covers almost half of the total Fayyum, whereas wheat made up almost 75 per cent of the crops and barley 15 per cent, olyra stood at less than two per cent:[21]

Table 6.1 A Fayyum crop report.

crop	*arouras*	%
wheat	134,315 1/2	74.6
lentils	880 1/2 1/16 1/32	0.7
beans	[ ]	
barley	26,26[0	14.5
olyra	3,118 1/2 1/4 1/8 1/16	1.7
grass	4,612 1/2 1/4 1/8	2.5
vetch (*arakos*)	10,109 1/2 [. . . .]	5.6
sesame	261	0.2
castor	55	0.04
poppy	100	0.06
[3 other crops]	201 1/2	0.10
	179,914 1/2 1/4 1/8 1/32	100.00

Furthermore, according to the accounts of the Zenon Papyri, whereas some workers still received groats and some barley, most now received their rations in loaves of higher-grade flour, called *semidalis*, or of whole-wheat flour, known as *autopyros*; the record shows that durum wheat was already well established here.[22] A century or so later, in the single village of Kerkeosiris in the south Fayyum, in 121/120 BCE olyra accounted for less than 1 per cent of the total crops that were grown, and this indeed was the very last year that the grain was recorded at all in this particular village.[23] The crop seems then to disappear from the record.

The existence of olyra at a somewhat earlier date may be traced in another way—in the occupational breakdowns prepared for tax purposes that survive for various villages. From the second century BCE an unpublished papyrus, now in Munich, lists occupations for a village in the north-west Fayyum. Twelve adults (at least eight of them male) are listed here under households where the household head was registered as a grain-pounder (*aletes*); in the same village a further four (two men and their wives) were recorded as bakers of emmer bread (*artokopoi*). On these figures there were four pounders to one baker of emmer bread,[24] and, on the pattern found elsewhere, these pounders and bakers

[21] *P.Petrie* III 75 (Jan. 235 BCE). The figure for beans is missing entirely, those for barley and vetch in part illegible; otherwise the list is complete. The area covered is almost 500 km^2.

[22] See *P.Cairo Zen.* II 59292 (250 BCE), with Crawford (1979), 137, 140.

[23] Crawford (1971), 183–4 and 106–21, more generally.

[24] *P.Monac.inv.* 343. xviii. 17–22, *aletai*; xiii. 35–9, *artokopoi*; the terms *olyrokopos* and *chondrokopos* are also found.

most probably worked for several villages, not just the one where they lived, for many villages had no pounders or bakers at all. Even so, the occupational record implies the continued cultivation here of old-fashioned olyra used for bread. Elsewhere, in other comparable lists, millers are normally *sitopoioi*, those who mill sitos wheat; it was they who ground the new flour, the durum wheat that was baked into finer loaves.[25] Since, therefore, it is the occupation of *sitopoios* that is far better known from the Ptolemaic papyri, we may thus trace the growing importance of durum wheat as reflected also in the record of the occupations of those that processed it.[26]

A typical distribution of the subsistence crops of the basin agriculture in the Ptolemaic Fayyum may be seen from the crop distribution reported for the sown land of Kerkeosiris in 116/115 BCE:[27]

Table 6.2 Distribution of crops in a Fayyum village.

crop	*arouras*	%
wheat	994	55
barley	55	3
lentils	186	11
beans	196	11
fenugreek	33	2
vetch (*arakos*)	178	10
black cumin	2	0.1
grass	18	0.9
fodder crops	81	4.0
pasturage	60	3.0
	1,803	100.0

The cereal crop of the village here accounts for 58 per cent of cultivation; the figure was sometimes higher.[28] For areas in a standard basin system this particular distribution may serve as a fairly typical example. As already noted, the old-fashioned wheat or olyra was no longer grown, but lentils and beans together (with their high nutritive value) made up 22 per cent of the crops, and fodder crops of various kinds (regular pasturage, vetch to keep the donkeys moving, fenugreek for rapid fattening, grass and other green crops) covered 19 per cent of the land under cultivation. It was in the fields around the village that the major subsistence crops were grown, and in land close by the village hand-watered plots (*lachaneia*) contained the other crops that are known from the papyri—

[25] *CPR* XIII 7. 9 (253–231 BCE), from Lysimachis; *O.Bodl.* 304. ii. 1 (3rd century BCE); cf. *CPR* XIII pp. 155–6, for *sitopoioi* milling wheat flour.

[26] Cf. *Pros.Ptol.* V 12597–663, with the various terms grouped together; *sitopoios* and *sitopoia* predominate.

[27] Crawford (1979), 142, incorporating the figures of *P.Tebt.* IV; cf. Crawford (1971), 183–6.

[28] Crawford (1979), 114–15.

the lettuce, cabbage and other vegetables, the cucumbers and herbs, and even the figs. With Kerkeosiris in the late second century BCE we find within the different basins that made up the village land a settled pattern of subsistence crops cultivated on different classes of land—the land that still belonged to the crown and the plots that the Crown had surrendered, either to the temples as sacred land or given out in military allotments. The only orchards known in this village of the Gharaq basin had been abandoned by the period of our records,[29] but orchards were still to be found in the nearby villages of Magdola and Ibion Eikosipentarouron.[30] As elsewhere, local variation is a feature of the agricultural scene.

The next crop of the Mediterranean triad that I want to consider is the olive, and together with the olive I here include all the other varied oil crops that in Egypt might compete with Athene's gift to Athens. Oil crops were grown both on basin lands and, in the case of olives, among the orchards and vineyards and in special olive groves (*elaiones*). The traditional oils of Egypt were castor oil (known as *kiki*-oil from the *kroton* plant) used for lighting, and sesame oil that was used for cooking. These were the two oils that appear in Egyptian marriage contracts of the Ptolemaic period.[31] Under the early Ptolemies the range of oil crops was extended; they were cultivated for sale, as cash crops, and their distribution and taxation were matters of royal concern. Indeed, the 259 BCE rulings of Zenon's boss Apollonios, in his position as minister for economics (*dioiketes*), on control of oil production are preserved as part of a papyrus compendium of royal regulations which now goes under the name of the Revenue Laws.[32] The oil crops covered in the rulings of the Revenue Laws are the traditional crops of castor oil and sesame oil, together with linseed (*linon*), safflower (*knekos*) and gourd (*elaion kolokynthon*). There is no mention in these rulings of olive oil, nor the lettuce and poppy oils that are known from the Zenon accounts. These, we must assume, were not yet fully established, or else, in the case of lettuce and poppy, were grown on an experimental basis in too insignificant quantities to warrant royal control. The major oil crops, it is clear, were both controlled and officially encouraged—though, as we shall see, not always adopted with enthusiasm—and their production in the eastern Fayyum in the mid-third century BCE was perhaps linked to the oil-processing plant in the new town of Philadelphia.[33]

In terms of cultivation, however, oil crops were also ideal since they grow on marginal land and are particularly suited to land that has just been cleared. So

[29] *P.Tebt.* I 60. 5, 38; 61a. 149; 62. 49.

[30] Magdola: *P.Tebt.* I 82, both olives and vines formed part of the temple lands; Ibion: *P.L.Bat.* 25, 21 (78 BCE), olives, other trees, and neighbouring vineyards.

[31] Pestman (1961); Thompson (1988), 184–5; Sandy (1989); Mossakowska (1994), 110–13.

[32] *SB /Bh.* 1; cf. Bingen (1978), on the overall content and significance of these rulings.

[33] *P.Cairo Zen.* II 59247. 9; IV 59717. 7; see Edgar, *P.Mich. Zen.*, Introduction p. 30, n. 1.

when in late July 240 BCE Hermogenes reported to his superior Theodoros—the irrigation and drainage engineer of the province—enclosing a letter from one of his subordinates, the state of sesame and castor planting was included amongst other matters.[34] The Zenon correspondence too is full of similar reports:[35]

> We are weeding the poppy and the wheat. But reckoning it up we find that some thirteen arouras only have poppy and the rest has salted up. They say castor will grow, and we have written, therefore, to Asklepiades in Tanis to see if he has castor-seed suitable for planting.

Or right at the start of the archive, even before the arrival of Zenon in the area, the minister's friend Artemidoros wrote to Zenon's predecessor Panakestor:[36]

> When I was on my way from Boubastos to Memphis, Apollonios ordered me, if possible, to go across to you myself or to send one of my men to pass on to you his instructions since he had heard that the land making up the 10,000 arouras was not being sown all over. He instructed me, therefore, to tell you that it should all be cleared of brushwood and should be irrigated and that, if possible, you were to sow the whole of it or, if not, that which you were not able to sow [sc. with regular crops]. . . was to be sown with sesame, and that no portion of the land was to remain unworked.

Here again the oil crop sesame is the crop for marginal land.[37] The wisdom of the locals—'they say it will grow'—has been adopted by the settlers for the exploitation of their new large estates. And we may expect the cultivation of such oil crops to coincide with those areas of the province that had been recently drained.

However, as we saw at the start of this chapter, it was the olive tree in particular that caught Strabo's eye as the typical tree of the area. In this he differed from Herodotus earlier, who makes no mention of olives in Egypt. We might indeed expect this concentration of olive cultivation to have come with the Greeks, for olive oil was the oil of their choice for cooking, as for anointing and cleaning their bodies—the ancient soap. Papyri however suggest that such an assumption needs modification. For while olive growing was attempted on the estate of Apollonios, with olives planted from pips and carefully tended,[38] in practice the record of olive groves in the Ptolemaic period is extremely sparse. As we have seen there is no record of the olive in the Revenue Laws of 259 BCE, and it is only under the Romans that olive plantations appear as a regular

[34] *P.Petrie* III 43 (3). 14–15 (240 BCE); see further Crawford (1973), 248.
[35] *P.Cairo Zen.* IV 59635. 8–17.
[36] *P.Cairo Zen.* V 59816. 1–6 (26 December 257 BCE).
[37] See further, *P.Cairo Zen.* III 593897; *PSI* V 500; 502; Rostovtzeff (1922), 64.
[38] *PSI* V 430. 1, *gigarta*, perhaps for planting; *P.Lond.* VII 2164. 7–8, planting out.

feature of the Fayyum landscape.[39] This may of course simply represent a gap in our material or, more probably, it reflects the lack of success of these early experiments. Olives are not easy to establish and, even when established, they take 5–15 years to produce and 35–50 years to reach maturity and full production.[40] It may well have taken time before the immigrants realised that grafting on to a stock that grew well in this area was essential to the success of this tree.[41]

The third form of land use I want to consider — subsuming the vine, the third crop of the triad — are the vineyards and orchards of the Fayyum, that garden province of Egypt where the many different trees provided shade for the peasants and produce for their owners.[42] In the mid-third century BCE, nut trees and fruit trees were sown in nurseries in the northern city of Memphis for planting out on the newly reclaimed land of Apollonios' estate: figs, walnuts, peaches, plums and possibly apricots too.[43] The context is one of widespread agricultural experimentation, with new crops brought in from different parts of the Mediterranean and from the lands of Alexander's conquests further east — a new strain of cabbage from Rhodes, garlic from Lycia, wheats from Kalymnos and Syria, figs from Syria and Cos, or the cystus from Carmania.[44] The case of the Rhodian cabbage is reported much later by Athenaeus from Diphilos of Siphnos.[45] Seed from the more tasty Rhodian cabbages were brought in and planted in Alexandria. The experiment started well and for a year the produce was successful. In subsequent years, however, the plant deteriorated, producing as earlier in the area a vegetable that was sharp and bitter to taste. What we cannot know is whether this is a real record of unsuccessful agricultural innovation or a further Greek tale of eastern inferiority.

Alongside the planting of trees came the planting of vines, which now made possible the large-scale production of wine in Egypt alongside the traditional Egyptian beer. Vines of course were known in pre-Ptolemaic Egypt.[46] Beer, however, had always been the standard drink of Egypt.[47] With the large-scale plant-

[39] Rostovtzeff (1922), 11–12, 103, for Roman olive groves; cf. *P.L.Bat.* 21 B, General index, s.v. *elaia* and *elaion*, for the Zenon Archive, and *P.L.Bat.* 25, 21. 13–14 (78 BCE), for an *elaionoparadeisos*, olives planted with date-palms and other fruit trees, at Ibion Eikosipentarouron in the 1st century BCE.

[40] Sallares (1991), 308.

[41] The 3,000 shoots of laurel and wild olive brought in from Apollonios' Memphite holdings were for parks rather than olive groves, *P.Cairo Zen.* II 59184 (255 BCE).

[42] For vineyard and orchard land in the Roman period see Sharp, in this volume, below, pp. 174–85.

[43] Préaux (1947), 26–7.

[44] Thompson (1984), 366–7.

[45] Athenaeus, *Deipn.* IX 369 f.

[46] Eyre (1994), 71; for Herodotus' false observation that Egypt lacked vines, see II.77. 4 above; for vines on the Delta estate of Arsames, Persian satrap in the late 5th century BCE, Driver (1957), 36.

[47] See Samuel (1996), 5, on cereals used; 3–12, with important modifications to the account of Kemp (1989), 120–2.

ing of vines in the Fayyum and the production of local wine, it was not the replacement of the national drink but an additional beverage that was provided for the new settlers and, especially, for the troops, who were used to wine. Tax-lists show us clearly that any village with more than a dozen inhabitants was likely to house at least one licensed brewer (*zytopoles*), but at the same time now there were sellers of wine (*oinokapeloi*), and there is plenty of evidence for the planting and nurturing of vines in the Ptolemaic Fayyum. Indeed by the second century BCE, as may be shown from a recently published Cologne papyrus studied by Clarysse and Vandorpe, the scale of wine production in the province was truly enormous.[48] Strabo's observations somewhat later were certainly well founded, and the area presumably exported on a large scale for the market in Alexandria and elsewhere in Egypt.

As already noted, there are two aspects to the question of agricultural innovation—the actual use of the land and those involved in its exploitation. Evidence for the planting of vineyards occurs in our earliest documentation; it went together with works on drainage and irrigation at the start of development in the area. Reeds used for the reinforcement of dykes were also employed alongside orchards and vineyards, both for the dykes around them and most probably for fenced protection, like the maize-stalk fences to be seen in the Fayyum today.[49] Work on vineyards was included in the contracts for irrigation works, and the irrigation engineer Kleon, who preceded Theodoros, had an interest (of precisely what kind is unclear) in the development of vineyards in his area of competence.[50] On Apollonios' estate and on other plots belonging to Zenon himself and to military settlers in the neighbourhood, the planting of new vine stocks proceeded apace, with different varieties brought in; Chian and Cnidian wine, together with native wine—the 'vin de pays'—were all shipped out from Philadelphia.[51] Zenon even made a copy of part of a manual on viticulture, and in this he shows himself to be a typical new man of the period, combining hands-on involvement with book learning.[52] At least with the new settlers, orchards and vineyards appear as attractive forms of agricultural exploitation, and the fact that taxes on these were payable in cash apparently presented no problems.

We have just seen the minister of economic affairs using his friend the doctor Artemidoros to convey instructions to Panakestor, the manager of his up-country estate. How typical is this of the way in which agricultural development was put into effect? How extensive was central control, at least in this early

[48] *P.Köln* V 221 (*c.*190 BCE), recording *apomoira* payments; cf. Clarysse and Vandorpe (1998).
[49] *P.Petrie* III 39 ii. 11–12; iii. 1–2; iv. 1.
[50] *P.Petrie* III 37b. i. 13; II 13 (17) = III 42 D. 3. 2–3.
[51] Rostovtzeff (1922), 93–106; Préaux (1947), 22–6. For 'Egyptian wine' in an Aramaic account of an earlier date, see Grelot (1972), 98–101.
[52] *PSI* VI 624; cf. Thompson (1984), 363–5, on contemporary scientific literature.

period? What the third-century BCE papyri show again and again is a strong central concern in the initial drainage, the continued irrigation and the agricultural exploitation of the new lands of the Fayyum. This may be seen in the close connection just noted between reclamation and irrigation works and in the encouragement of new forms of agriculture. Just as the new administration was concerned to acquire new land, so it was also interested in bringing that land under cultivation. The same members of the central administration were concerned with both aspects — men like the irrigation and drainage engineers Kleon and Theodoros, Apollonios and his successive managers Panakestor and Zenon.

A second way in which central interest can be illustrated is in the provision of tools for the work that was needed. Metal was still relatively rare in Ptolemaic Egypt and tools were kept in central depots (*skeuophylakia*).[53] It is mainly shovels that are recorded, shovels used for shifting silt and earth; these were centrally provided cost free on a 'return or replace' basis and their number is specified in surviving work contracts.[54] But agricultural implements came under the same disposition, like the hoes provided for work on the vineyard at Hephaistias belonging to Berenike, daughter of the king, within the administrative nomarchy of Timotheos.[55] The development of this period was thus closely controlled.

Once the land was prepared and the crops were planted the king and his administration were still concerned. A crop schedule, known in Greek as *diagraphe tou sporou*, controlled the crops to be sown and before these crops were harvested an estimate was made, a *syntimesis*, of the rent that could be collected. These operations have been studied before,[56] and the only reason to mention them here is as further examples of the degree to which the agricultural exploitation of the land, in terms both of technical input and the crops that were grown, was a matter of central concern.

So far the picture has been one of success — an upbeat account of agricultural innovation, experimentation, and Graeco-Macedonian technical expertise transplanted to a new country. That of course is, in the main, the result of the survival of Greek papyri — the correspondence of the settlers, both military and civilian, the documents of their new administration and the system they introduced. But what of the other side, of what was old in the picture? How far in the Ptolemaic Fayyum did new and old coexist, or how far did they come into conflict? In a famous letter addressed to Apollonios, only twenty days after their

[53] *P.Petrie* II 5 a = III 42 B (5). 2.

[54] *P.Petrie* III 42 F (c). 9–10, shovels; 43 (2). i. 11–13, 20 shovels; ii. 32–3, 13 shovels; iv. 31–4, sufficient shovels; verso v. 5–6, shovels (246–245 BCE).

[55] *P.Tebt.* III 720 (247–245 BCE).

[56] Vidal-Naquet (1967), stressing the conflict of traditional (subsistence) and of immigrant (cash crop) agriculture; *PSI* V 502. 19 (257 BCE), with Bingen (1970).

arrival in the area, a group of farmers from the Heliopolitan nome in the valley transferred to Philadelphia complain to the *dioiketes* of their treatment:[57]

> To Apollonios the *dioiketes*, the farmers from the Heliopolite nome, from the village of Philadelphos in the Arsinoite nome from your 10,000 arouras, greetings. After you gave us 1,000 arouras out of the 10,000, which we worked and sowed, Damis took away from us 200(?) arouras and, when we protested, carried off three of our elders until he compelled them to sign a deed of renunciation. And although we were willing to move from the 1,000 arouras, and asked him to bear with us only until we had cultivated and sown, he still refused, and allowed the land to remain unsown. There is also another scribe, an Egyptian, one of an evil tribe, who does not allow the city to be settled, but drives away those who are there. And there are not a few mistakes (*hamartemata*) which have been made in the 10,000 arouras, because there is no one with experience in agriculture (*anthropos synetos peri georgian*). We therefore implore you, if it seems good to you, to call some of us in and listen to what we wish to tell you. For this is the twentieth day since our arrival. We wish . . . are unable, but we have spent whatever we had when we moved in. Farewell.

The whole complaint provides an interesting study in the psychology of rulers and ruled, as native farmers adopt both the language and rhetoric of their conquerors to describe the Egyptian officials who were causing them problems. We may well wonder what specifically it was that these farmers from the Nile Valley found wrong in the very different conditions of the Fayyum, but the point that I wish to stress here is that complaints of this type were made.

It was not easy going for the immigrants—and no doubt they often got it wrong. In agriculture, as in other local practices, they needed to learn the ways of the land. Such at least was the native view. In practice, however, innovation of various kinds did take place. Indeed, one of the striking features of the whole agricultural picture is the introduction of cash into what had previously been an agricultural world that worked only in kind. Agricultural experimentation and investment in cash crops might appeal to immigrants, as illustrated well in a letter to Zenon:[58]

> Horos to Zenon, greetings. By 12 Choiak [3 February] there will be 130 arouras sown with poppy. Please, do come and visit so you may feast your eyes on the sight. Farewell.

Such immigrant enthusiasm for new cash crops, however, was not necessarily shared by all. If Vidal-Naquet is correct in his picture of the non-observance of the crop schedule,[59] the way that the locals reacted was the expected one of

[57] *P.Lond.* VII 1954 (Oct./Nov. 257 BCE); cf. 1955, a further complaint to Zoilos.

[58] *P.Cairo Zen.* II 59243 (Feb. 252 BCE); see Clarysse and Vandorpe (1995), 105–7.

[59] Clarysse reports that not all of his readings for *SB* I 4369 a and b will stand.

refusal to change.[60] Like the Euboean peasants documented by Juliet du Boulay in the 1960s unwilling to abandon their reliance on basic subsistence crops in favour of the more economically profitable resin-tapping of pines — 'why should I buy my bread when I can grow it myself?'[61] — so the Egyptian peasants of Ptolemaic Egypt were slow to adopt the new crops and new ways. And yet, as so often, it is the immigrant who tries to bring change, and some of the changes the Greeks of Ptolemaic Egypt brought to Egyptian agriculture were to last until the Arabs. In this process of change it was the new model estates of the Fayyum that we can document as leading the way.

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[60] Vidal-Naquet (1967), 25–36, on *SB* I 4369 a–b.

[61] du Boulay (1974), 34–5.

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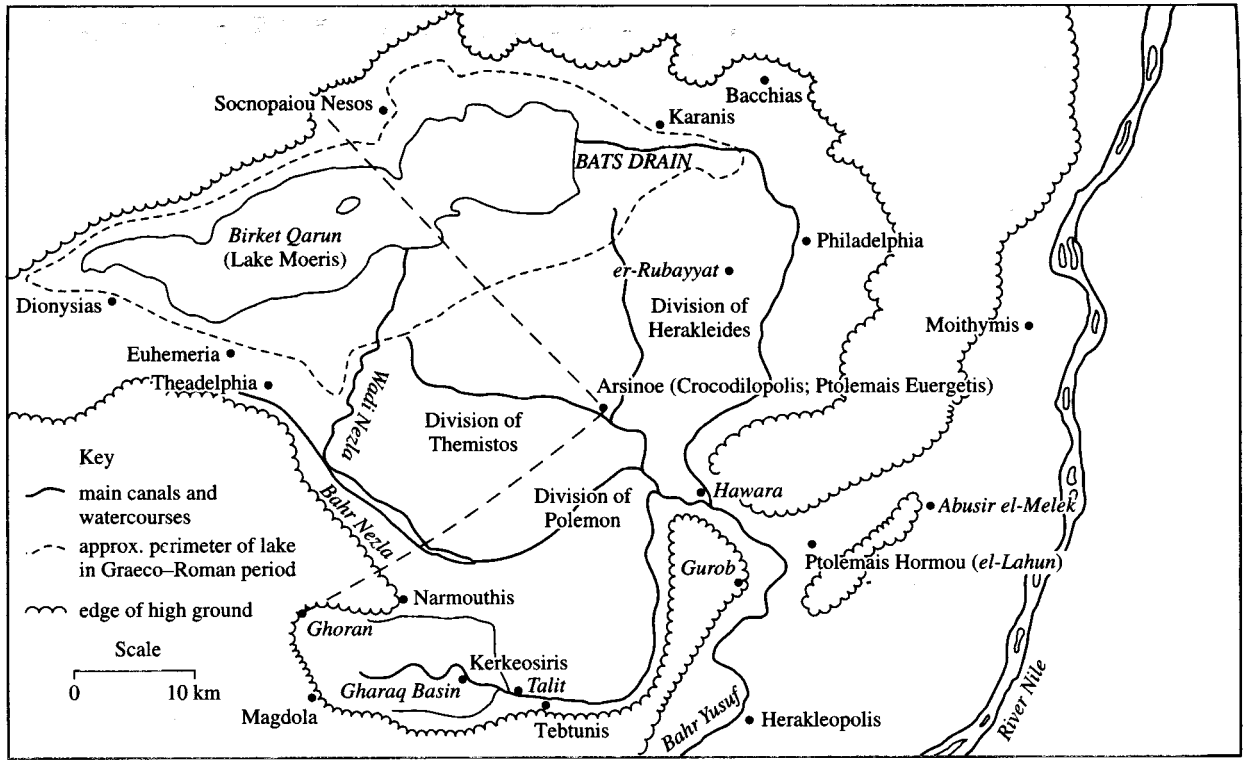

Map 2. The Arsinoite Nome (Fayyum)