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BERNHARD WOYTEK (ED.)

INFRASTRUCTURE AND DISTRIBUTION IN ANCIENT ECONOMIES



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BERNHARD WOYTEK (ED.)
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IN ANCIENT ECONOMIES

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BERNHARD WOYTEK (ED.)

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ROGER S. BAGNALL

Papyrus Documents for the Study of an Ancient Economy: Methods and Materials from an Egyptian Oasis

This paper starts from a question: how did an isolated oasis (the Dakhla Oasis of Egypt's western desert) make a living in an imperial system? High transportation costs and limited natural resources are compensated for by a strategy of autarky in bulk commodities, of export of high-value crops that can be carried efficiently by camel caravans across considerable distances, of labor-intensive thread and cloth production, and of exploitation of the environment's capacity for multiple crops a year, with one of those typically being a nitrogen-fixing legume useful for animal food and renewing fertility in the absence of the Nile flood. This picture derives largely from papyrological texts, but gaps are filled by archaeological evidence for crops (millet) and minerals (alum). Much remains unknown, particularly in the area of transportation.

The themes laid out for the conference from which this volume results have been close to the centre of my interests for many years, most acutely since 1995, when I was asked to undertake the publication of a codex of wooden boards, found in Colin Hope's excavations at Kellis in the Dakhla Oasis.¹ These boards, which I have called the *Kellis Agricultural Account Book*,² give us the internal accounting kept by an estate manager over a period of three years, in the third quarter of the fourth century of our era, probably from 361 to 364. They evoked for me from the start difficult questions about how the economy of an isolated oasis could have functioned within an imperial state, and I offered some tentative answers in my edition of the text. Issues like comparative advantage in production, the infrastructure and cost of transportation, and distinctive resources all played a part in my thinking. But much remained unsettled in my mind, and my remarks in editing this text were necessarily preliminary. I subsequently began an excavation at another site in the same oasis, in part aimed at generating more evidence for understanding how the Dakhla Oasis, along with Egypt's other oases, managed to overcome distance – long distances, which conventional assessments of ancient transportation infrastructure have generally seen as fatal to a complete integration into networks of distribution and circulation.³

The question is in essence fairly simple: How could the people of the Great Oasis, separated from the Nile valley by hundreds of kilometres of desert, and with little except dirt, sand, stone, and water locally available, live at a level above subsistence? Living at a level above subsistence means, in this case, both being able to import across the desert those necessities and even luxuries not produced locally, and at the same time finding the funds to pay taxes to the imperial state of which the oasis was a part. Something had to generate an inward flow of money. There may have been a caravan trade to the west and southwest, to the Garamantian kingdom in central Libya and even as far as Darfur and Chad, although the arguments for such connections are at present more theoretical than based on direct evidence.⁴ But this trade, across much greater distances than those

¹ General information about the excavations can be found at <<http://artsonline.monash.edu.au/ancient-kellis/>> [accessed on 23 November 2017]. A bibliography of publications concerning Kellis is at <<http://artsonline.monash.edu.au/ancient-kellis/ancient-kellis-publications/>> [accessed on 23 November 2017].

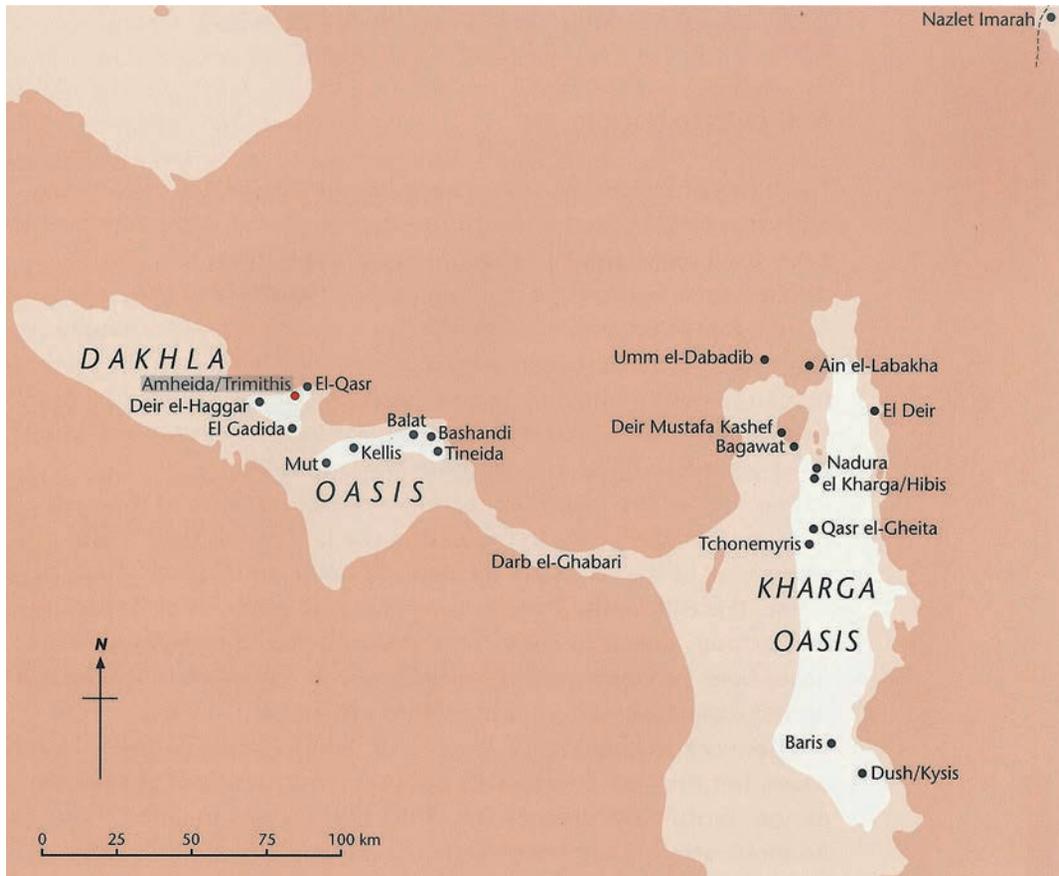
² Bagnall 1997. Substantive reviews can be found at *Antiquité Tardive* 7 (1999), 331–335 (Jean-Michel Carrié); *Journal of Roman Archaeology* 12 (1999), 745–751 (Dennis P. Kehoe); *Chronique d'Égypte* 76 (2001), 290–299 (Henri Me-laerts) and *Gnomon* 73 (2001), 424–427 (Andrea Jördens). The fullest discussion is Andreau 2004.

³ Adams 2007, 3–17 gives an introduction to this problem; the bibliography is extensive.

⁴ See for a relatively sympathetic view Gradel et al. 2012; my own skepticism in Bagnall 2012.



Map 1: Map of Egypt, © Amheida excavations, ISAW, NYU



Map 2: Map of oases, © Amheida excavations, ISAW, NYU

that separate the oases from the Nile, cannot have been more than a tiny part of the answer to my question. Dakhla and Kharga were integrated in, and oriented to, Egypt,⁵ not the west.

One has to start with the undeniable fact that the oases succeeded in this task. Kellis (Maps 1–2) is by itself the source of sufficient evidence to prove that in the second century of our era luxurious living was possible nearly four hundred kilometers from the valley in the zone extending from Hermopolis to Lykopolis that seems to have been the major point of contact in the Roman period.

That distance is measured by the easier route that ran from Dakhla to the valley via Kharga, rather than straight across the desert – the latter route, the Darb et-Tawil, saves only a day or two of travel in any case. The elaborate gladiator vase found at Kellis, surely of Alexandrian workmanship, shows the degree of surplus wealth available to the wealthier residents.⁶ The artistic styles of the wall paintings found in wealthier houses at both Kellis and Trimithis are drawn from widespread metropolitan norms.⁷ The oasis appears to have been fully integrated into the monetary circulation system of Roman and then late antique Egypt; the hoard of nearly 800 billion tetradrachms discovered in our excavations at Amheida near the temple, perhaps on the site of a priest's house, is completely typical of Egyptian hoards in its composition.⁸ And the fourth cen-

⁵ "Egypt" in this context means the Nile valley, as always in papyri from the oases.

⁶ Hope – Whitehouse 2003.

⁷ Hope – Whitehouse 2006.

⁸ The tetradrachms run from Nero to Antoninus; this hoard will be published by Thomas Faucher.

tury bronze coins found in profusion in dumping, occupation, and hoard contexts of that period come from a wide variety of mints outside Egypt as well as from Alexandria.⁹

Nor can we reasonably suppose that the whole flourishing oasis society of the Roman period was simply a vanity project, subsidized by the government and provisioned from the valley.¹⁰ It is conceivable that this was true to some degree of the Egyptian settlement in Dakhla in the Old Kingdom, when the difficulty of transportation, before the introduction of the camel, was greater, the need for elaborate stations to provide donkeys with water was acute, and the goods produced in the oasis were destined for luxury use at court.¹¹ But we cannot explain the enormous growth in settlement in the early Roman period in such a way.¹² The introduction of the camel in the Persian period, or possibly the Saite period, had reduced materially the need for permanent infrastructure on the desert roads.

All of these positive remarks do not mean, by the way, that we should fall into the trap of thinking of the oases as the “isles of the blessed,” as they are so often called, using a phrase drawn from Herodotus (3.26). They are not an easy place to live even today, with high temperatures even by Egyptian standards for much of the year, and dust and sand storms even in the better season from late fall to early spring. Bioarchaeological study of the human remains from both Dakhla and Kharga has offered sobering results: malnutrition, disease, and trauma are ubiquitous. How much of the trauma resulted from violence and how much from accidents is hard to say, but both were prevalent. Parasites and disease interfered with nutrient absorption and led to persistent anemia.¹³ We do not have data sets of comparable quality for the valley, and perhaps things were not much better there. But life in the oases was hard.

All of this might make the Dakhla Oasis sound like a “case study” in the worst sense of that term, an isolated and atypical economy with problems largely irrelevant to understanding the rest of the Roman world. To my mind, instead, it simply poses problems we encounter elsewhere, only in a more extreme form. This fact strikes me as analytically useful, making the contours of evidence and circumstances sharper than they usually are. The oases also allow the integration of documents, environmental evidence, archaeology, and other sources to an exceptional degree and are thus methodologically interesting for the wider canvas. So, at all events, I shall argue.

Inevitably, the inquiry begins with enumeration, a set of existence proofs. This is not just a tribal habit of papyrologists; it comes with almost any discipline dealing directly with primary evidence. In listing the goods, mainly foods, found in the *Kellis Agricultural Account Book*, I worked in parallel with the project archaeobotanist, Ursula Thanheiser. She made lists, too, of plants of which remains were found in the excavations, and we matched up our lists. Wheat, barley, hay, green fodder crops, fenugreek, safflower, sesame, cotton, turnips, onions, vetch, figs, dates, doum fruits (from another type of Egyptian palm tree), olives, jujubes, grapes, cumin: most could be identified both in the documents and in the plant remains.¹⁴ But this does not get us very far from an economic point of view. As I pointed out in reviewing John Matthews’s book *The Journey of Theophanes*,¹⁵ it is all well and good to list the large array of foods that Theophanes and his entourage traveling from Egypt to Antioch purchased and consumed, but both students of

⁹ See Bowen 2012 with bibliography on the Kellis coin finds; there are also extensive finds of coins to be published from Amheida and Ain el-Gedida, as well as a recently found hoard at Ain es-Sabil (excavations of K. Bayoumi).

¹⁰ Cf. Gradel et al. 2012, 119, criticizing Adams 2007 for describing the oases as dependent on the Nile valley for provisions.

¹¹ Up to 2014, there are 11 volumes in the series “Balat”, published by IFAO.

¹² The early Roman growth in Dakhla is described by Mills 1993 as the product of government action, but one need not accept that hypothesis to recognize that the growth in settlement and cultivation was rapid.

¹³ Dupras et al. 2008; Wheeler et al. 2011.

¹⁴ Bagnall 1997, 35–46.

¹⁵ Matthews 2006.

nutrition and economists will probably be more interested to know that 64% of the calories consumed by the party came from bread, 8% from olive oil, 4% from wine, 7.5% from meat, sausage, cheese, and fish, 3% from eggs – leaving just 13.5% of the calories for all other foods combined.¹⁶ We cannot quite so easily pull off a similar analysis for the Kellis Account Book and the rest of the oasis documentation, not even for the botanical remains, which reflect the taphonomic processes affecting plant remains and the relative survival qualities of the fruits, woody parts, leaves, and seeds of different plants as much as their original presence. But we are not without tools to support a structural analysis of the information.

I undertook the first element of this analysis in the edition of the account book. I calculated the annual rent stream of the land managed by the unnamed author of the accounts, who was one of at least five *pronoetai*, or stewards, working for the same landlord in Dakhla; the landlord himself, Faustianus son of Aquila, lived in Kharga. It was evident from the accounts that the wheat, barley, and wine were all, or virtually all, disbursed locally for estate operating expenses; it was equally evident that some other perishables must have been consumed in the oasis. But relatively high-value fruit crops, mostly olives (with olive oil), dates, and jujubes, remained, representing about 40% of the value of the total revenue, and I offered the hypothesis that these were exported and formed the basis of Faustianus's net income – particularly olives and olive oil, which made up four-fifths of this surplus.

Subsequently, I have looked for additional evidence to test this hypothesis. One important contribution is a direct witness to the cost of transportation across the desert, in this case from the Small Oasis (Bahariya) to the Fayyum. This papyrus of AD 145 (W.Chr. 321 = BGU 3, 697) shows that transportation of 21 kg of alum over the 270 km in question cost 7 ½ drachms.¹⁷ It may then be calculated that 1 drachm would at that time have paid for 756 kilogram-kilometres.¹⁸ This figure can be used as a measuring rod for transportation costs more generally, although it must be adjusted for changes in currency and prices over time. It is sufficient to show that the cost of transporting wheat between the valley and Dakhla, or the reverse, would have been greater than or at least about the same as the market value of the wheat at the point of production: that is, transportation between valley and oasis would have doubled the cost of the goods or more.¹⁹ That does not make such transportation impossible, but it does make it economically and commercially unattractive. We do know that wheat was transported from the valley – from Oxyrhynchos, to be exact – to the Small Oasis, a distance a bit over half that to Dakhla. We also know that at least some of the time prices for wheat in the Small Oasis were roughly a half higher than in the valley, which corresponds to the valley price plus the cost of transport. That suggests that the attractiveness of using oasis land for fruit crops rather than for wheat was in that case sufficient to offset a 50% cost penalty for wheat and permit its importation. The Small Oasis is indeed small, and watered land is highly prized. But offsetting a 100%-plus penalty to Dakhla is unlikely. So Dakhla is not likely to have received such staple goods from the valley. Even less likely is that Dakhla would have produced wheat (or, worse still, the less valuable barley) for export to the valley, where the entire market value would have been consumed by the cost of transportation from the oasis. Dakhla must have aimed at self-sufficiency in basic grains, just like Faustianus's estate; but not at an exportable surplus.

Similar calculations may be carried out for other goods. They show that wine, at least ordinary wine, would also have increased in cost so much in transit as to be unmarketable in the valley, but that the much denser and more valuable olive oil would not; it would have only a 10–15% increase

¹⁶ Bagnall 2007.

¹⁷ For the following analysis see Bagnall 2008, 29.

¹⁸ The calculation is simple: 21 kg x 270 km = 5,670 kgkm; divided by 7 ½ drachms = 756 kgkm/dr.

¹⁹ Very approximately, 365 km (Dakhla to valley) x 30 kg (per *artaba*) divided by 756 = 14.3 drachms. Wheat in the second century typically cost 8–10 drachms per *artaba*, occasionally somewhat more. The cost of transportation would thus be at least equal to the value.

in cost. That analysis certainly is consistent with the hypothesis of an olive-oil based Roman boom. The advantage the oasis had in olive production was profound: water did not have to be raised in order to reach land situated above the flood plain for olive trees to be irrigated.

But new evidence has complicated the picture that I drew in editing the account book. I noted at the time that there was a modest amount of cotton included in the rent stream, and that it too may have been part of the estate surplus. But the 17 kg of raw cotton in the annual rents of the steward's estate unit amounted to only about 1.5% of the monetary value of the estate's income stream, so I did not make much of it. The excavations at Amheida have changed that, for the ostraka have produced several little throw-away accounts with much larger amounts of cotton, showing that the small role it seems to play in Faustianus' rent stream is not necessarily representative of its overall importance in the economy.²⁰ These new texts led me to revisit the previously-known textual evidence for cotton production in Egypt, into which it seems to have come from the Meroitic kingdom to the south. Analysis of this documentation showed that there is no evidence for cotton production in Egypt during the Roman period except in the oases. It is thus a distinctive part of the oasis economy. This makes good sense ecologically, as cotton is a summer crop, which could not have been grown in the valley in ancient times except in small quantities on raised plots of land, along with trees and vines; the rest of the valley was covered by the Nile flood at that season. In the oases, by contrast, the water flowed from the wells 365 days a year, allowing two or even three crops, as Olympiodorus observed.²¹ So not only could the oases produce cotton where the valley could not, they could do so using seasonal capacity that was unusable in the valley until the first Aswan dam was built more than a century ago.

But the observation of a larger role for cotton than could have been guessed at in 1997 does not finish this topic. Anyone who has ever seen raw cotton knows that it is fantastically bulky proportionate to weight. The thought of camels plodding across the desert plateau with vast bales in the face of the strong north wind is daunting or ludicrous, depending on your taste. It seems likely that the cotton was at least spun into thread in the oases before export, if not also for the most part woven into cloth, creating a vast amount of added-value demand and opportunity for employment, particularly for the women.²² There is in fact evidence for women professionally employed as spinners at Kellis.²³ In a country which otherwise probably experienced substantial underemployment because of the seasonality of work and partial enforced idleness during the Nile flood, the oases would have enjoyed, if that is the right word, a higher average level of occupation through the year. In principle, this should have improved the relative economic situation of the oases compared to the valley and helped offset transport costs.

Up to this point, we can see some of the outlines of a response to the question with which we began: How did an isolated oasis make a living in an imperial system? High transportation costs and limited natural resources are compensated for by a strategy of autarky in bulk commodities, of export of high-value crops that can be carried efficiently by camel caravans across considerable distances, of labor-intensive thread and cloth production, and of exploitation of the ability of the environment to allow multiple crops a year, with one of those typically being a nitrogen-fixing legume useful for animal food and renewing fertility in the absence of the Nile flood. If, as has been suggested, much of the cotton was exported from Egypt to other parts of the Mediterranean world, so much the better.²⁴ But many questions, loose ends, and possible directions of investigation are still left, and I now turn to these.

²⁰ O.Trim. 1, 38 and 44.

²¹ Olympiodorus, FHG 4.64.33; cf. Wagner 1987, 116.

²² Gradel et al. 2012, 138–139.

²³ See Bagnall – Worp 2011 for the evidence from census declarations for female spinners at Kellis; this is extremely unusual, as women in the census declarations almost never have stated occupations.

²⁴ Gradel et al. 2012, 139–140.

First, we know little about the actual transportation infrastructure (Map 2).²⁵ Because of the work of the Yale Theban Roads Survey project and the extension of this project to the western desert, we have some idea of the roads in the pharaonic period, particularly in the Middle and New Kingdom. The essential route ran from Girga in the Nile valley, north of Thebes, through the north of Kharga, which probably provided resting and watering stops, and on to Dakhla, with branches extending to the central and southern parts of the Kharga oasis.

The site of Abu Ziyar, located midway between the passes out of the oasis and the Valley, provided physical infrastructure for a permanent Egyptian presence within a system of road-monitoring.²⁶ The discovery of a series of sealings reveals a careful administration of the site, involving checking or certification of the contents of vessels transported along the road, from the early 12th Dynasty onwards.²⁷ In the New Kingdom, the site of el-Tundaba, midway between Girga/Abydos and Kharga,²⁸ equipped with a sizable cistern, replaced the by-now abandoned site of Abu Ziyar and was apparently designed to control water provisioning and maintenance on the track connecting the valley and the wells of North Kharga.

This road system is consistent with the long-time pharaonic governance of the Upper Egyptian oases from Thebes and the close ties between the priests of Amun at Karnak and the cults of the Kharga and Dakhla oases. But in the Roman period, the documents from Kellis suggest that the orientation of the oases had changed. The destinations mentioned in the papyri are further north, in Middle Egypt: Hermopolis, Antinoopolis, Aphrodite in the Antaiopolite, Panopolis. The major roads of the period, from Dakhla directly or from north Kharga, reached the valley near Lykopolis (Assiut – this is roughly the route of the modern road) and to its north, about in the middle of the stretch of the Nile valley from Hermopolis to Panopolis. These roads have hardly been explored so far, especially the Darb et-Tawil, the direct route from Dakhla to Lykopolis, and I cannot say if they had any watering stations along them or not (water is harder to find on the high desert plateau than in the Eastern Desert). Did the government or anyone else invest in infrastructure? We do not know. But the middle Nile was economically more important than Thebes in the Roman period and probably a better market for the products of the oasis. By contrast, in the pharaonic period the royal establishment and the temple of Amun were the main customers for oasis wine, a true luxury good. Further north, Oxyrhynchos was the dominant partner for the Bahariya Oasis, but that oasis was also connected to the Fayyum.²⁹

Another area requiring more attention if we are to test the olive-oil hypothesis properly is ceramics. Oil must have been transported to the valley in some sort of container, and this seems more likely to have been pottery than skins. If so, it should be possible to identify oasis vessels in excavations in the valley. There hardly exist so far the detailed reports on ceramic finds at such sites that would be required, detailing both shapes and fabrics. It seems more likely that the vessels would have been amphoras than that they would have been the kegs characteristic of the oases but evidently used for

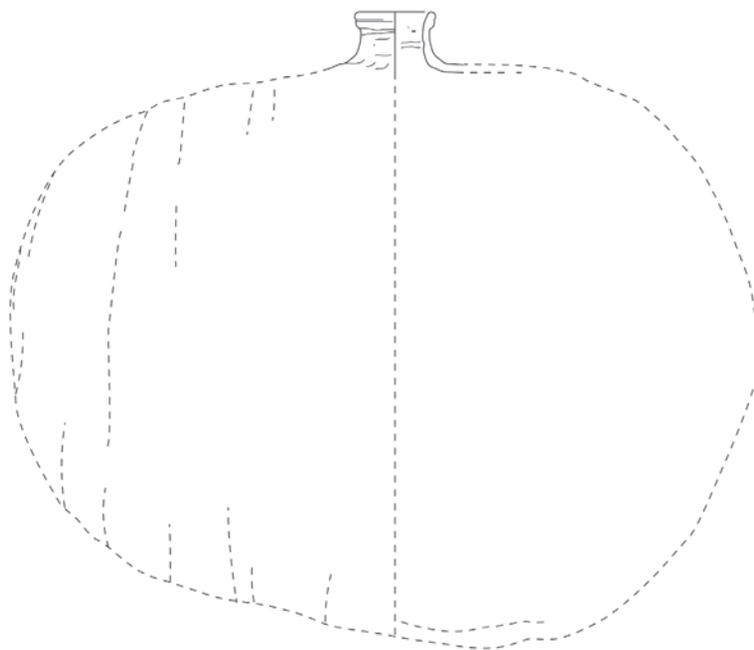
²⁵ I am indebted to Gaëlle Tallet's part of a joint paper we presented to the Oasis Magna conference at ISAW in September 2014, for what follows: Bagnall – Tallet forthcoming.

²⁶ Darnell 2013, 809–810.

²⁷ Also under Mentuhotep II, the Great Steward Henenu visited the desert area and exercised fiscal control: his titles, among which is that of “Sealer of the oasis”, and his involvement in taxation of the 8th (Thinite) and 10th (Antaiopolite) nomes imply that he held fiscal duties on the main Girga-Kharga road, according to Darnell: Darnell 2013, 795. An offering stela dating to the 12th/13th dynasty provides us with the title of its owner, Inu, “General of the army of the oasis,” but, though it is very plausible, there is no certainty that the oasis mentioned is the Great Oasis: Philadelphia, University Museum, 54.33.1: Fischer 1957. Controlling the frontier area and monitoring the trade along the caravan roads was probably part of the office. See further Bagnall – Tallet forthcoming.

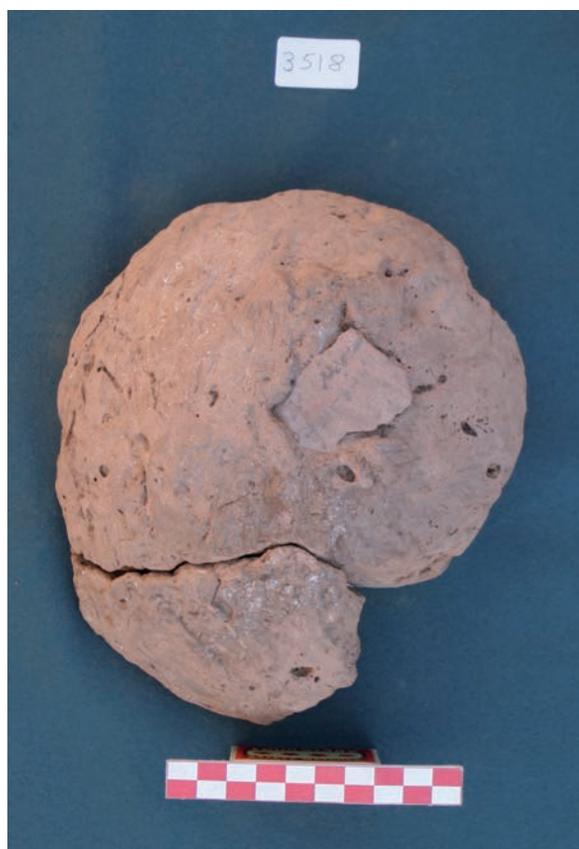
²⁸ Darnell 2002; Darnell – Darnell 2013; see <<https://egyptology.yale.edu/expeditions/past-and-joint-projects/theban-desert-road-survey-yale-toshka-desert-survey/abu-ziyar/remains>> [accessed on 20 November 2017].

²⁹ Wagner 1987, 146–150.



0 1 5 cm
1/4
A05/2.1/67/2774

Fig. 1: Drawing of a keg from Amheida, House of Serenos, © Clementina Caputo



Figs. 2a-b: Jar stopper top and bottom, © Amheida excavations, ISAW, NYU

internal transport rather than export (Fig. 1). The ceramologists in the Amheida team think these kegs were used for water or milk rather than for wine or oil. The mud jar stoppers for wine that we find in the excavations are consistent with amphora mouths, not keg spigots (Figs. 2a–b).

We are only at the beginning of the attempt to trace oasis exports to the valley, but eventually it should be possible to improve our sense of the distribution of oil. By contrast, the poorer preservation of organic materials in the valley and the lack of distinctive markers of oasis production will probably make it impossible to track exports of cotton thread or fabric.

What is missing from this picture? What does not spontaneously emerge from the documents, nor even from the kind of interrogation to which we have subjected them? One obvious answer is metal. There is little mention of metals in the papyri, ostraka, and tablets from the oases. It is the consensus among those working in Dakhla that there was no local production there or in the other oases, only working of metal imported from outside. Whether that is right, I cannot say. There is an iron mine on the desert plateau outside Bahariya Oasis today, but there is no evidence that it was worked in antiquity. There is a lot of iron in the water in Dakhla, coming from the sandstone of the deep aquifer. Water from the shallower strata used in antiquity also had a lot of iron in it, as we can see from the deposits left by the water from the wells. But it is not obvious that the available quantity and concentration of metal were sufficient for exploitation; and the oases were not rich in combustible material to help in metallurgical processes. It seems safest to assume for now that the oases had to import all of their iron, copper, silver, and gold; plus tin and lead, if they needed them.

That provides one of the answers to the question we have not yet asked: What occupied the camels on their return journey from the valley? But we can leave that aside. There were lots of things the oases did not produce, like papyrus, fancy glassware, African Red Slip ware, fish sauce, imported wines, and so on. I am not worried by a need for imported goods to load the camels. I want to know how they paid for them.

Another important absence from the documents is millet. The Greek word *kenchros* never appears in a text from any of the oases, as far as I know. And yet it was present and may have played an important role. Around the time I was editing the account book, Tosha Dupras identified by means of stable isotope analysis of human remains from Dakhla the presence of a carbohydrate type, C4, that was not derived from wheat or barley. It had to be either maize or millet, and maize is a New World crop unknown in Egypt until modern times.³⁰ Not long after she presented this discovery, pearl millet was found in the Kellis excavations, and in some quantity.

It remains unclear whether people were eating millet regularly or ingesting it indirectly, through eating meat or dairy products from animals that had consumed it. It may have been suitable for a porridge given to small children and sick people. Why does millet matter to us? Because it is also a summer crop, like cotton. It can be grown in a season when the flood plain of the Nile valley was growing nothing. For the oases, it was another means of increasing productivity. It is also, of course, an unnerving example of the ability of written documentation to miss entirely a significant crop; it is bioarchaeology and archaeobotany that come to our rescue. Millet is probably missing from the documents mainly because no one paid taxes or rent in it. Still, it is somewhat surprising to me that we do not have a single order to deliver an *artaba* of millet. Olympiodorus does mention it, it is true.³¹ We are not imagining this. But one wonders what else can be escaping our notice.

Alum very nearly does. When Guy Wagner wrote his *magnum opus* on the oases three decades ago, there was documentary evidence for it in the Small Oasis, but only physical evidence of extraction for the Great Oasis.³² Since then exactly one document has emerged to enlarge the dossier,

³⁰ Thanheiser et al. forthcoming.

³¹ Olympiodorus, FHG 4.64.33; cf. Wagner 1987, 116.

³² Wagner 1987, 306–309.

an ostrakon from Kellis mentioning a tax on alum (O.Kellis 24; fourth century, perhaps 329/330 or 344/345). More has also been learned from field survey, and it seems highly likely that the oases saw an active extractive industry throughout the Roman period.³³ Its distribution remained a government monopoly throughout the period, as far as we can tell, and this is perhaps responsible for the documentary silence: we have no official archives and few public papers at all from Dakhla and Kharga. It may have been a significant contributor to the oasis economy, even if few of the profits remained in oasis hands. But it is nearly a blank in the documents, and we do not know who actually extracted it.³⁴

Various types of archaeological evidence thus extend our documentation in important ways, showing us the parts of the economy that escaped the kinds of texts we have and reminding us of the limits of a purely documentary approach to the economy. It is far from sure that we are not still missing some important elements. In fact, we are surely ignorant of one critical piece, the physical spaces and organizational mechanisms by which oasis products were organized into caravans for export. We do not know if this took place in the major towns or outside them, or how centralized it was, and we know little of the personnel involved or the legal structures. Yet this whole area, too, is a significant part of the infrastructure of the transportation of goods between oasis and valley. Were there central markets where producers, brokers, and transporters interacted? How was the traffic financed?

What little we know about the organization of this trade comes mainly from two papyri from Kellis, dated 319 and 320, in which two men form partnerships in successive years for caravan journeys, evidently from the Dakhla Oasis to the valley and back. One partner supplies the animals and his own labor, while the other provides the capital to buy goods for the journey. They are to divide the surplus or shortfall equally. That it was a surplus in 319 may be suggested by the fact that the capital for the second year is more than twice that for the first. But it is again all supplied by the passive partner. From this slender base one might hypothesize that the caravans were made up of large numbers of small operators, with the camel-owners restricting their capital investment to their animals. This will have diversified systemic risk, but at the same time it means that the operators were individually not large enough to absorb much damage from casualty events. The amounts at stake in these contracts were not large; our price data for these years are not extensive, but the first loan of 12 talents would have bought something like 12–18 artabas of wheat at this time; put into high value goods, the sum would have loaded only a camel or two. Of course the transporter Ouonsis may have borrowed from other investors, and the investor Timotheos may have put money on other operators; we have no way of knowing.³⁵

This is far from the only model of how transportation may have worked. Another papyrus from Kellis (P.Kell. 1, 51) gives us a receipt from a resident of Hermopolis to a camel-driver from Kellis for a camel load that included dried figs, raisins, linen, and other goods now lost to a lacuna. The same camel-driver, as it seems, received a receipt (P.Kell. 1, 52) from a resident of the oasis village of Tpake for the delivery in Hermopolis of loads of olives and doum-fruits “so that I may provide them to my master the landlord.”³⁶ These receipts may help us understand the presence of a former magistrate of Hermopolis, writing on behalf of an illiterate villager of Kellis, in a petition submitted to the syndikos of the oasis, a former magistrate of Mothis, the oasis capital.³⁷ What was

³³ Picon et al. 2005.

³⁴ We know even less about ochre, which is found in abundance in oasis formations, and which may have constituted another valuable export.

³⁵ The treatment of this papyrus in Gradel et al. 2012, 140–141, exaggerates its scale (“une société de transport de produits”) and mistakenly attributes it to Kharga, which is nowhere mentioned. The various supposed starting-points for the caravan (Red Sea; Alexandria; Sudan: 140, note 158 for references) seem to me entirely mistaken; there is no reason not to think that it is an Oasis-Valley-Oasis round trip. Pouonsis is a Lykopolitan name. The two papyri are reedited in Bagnall 2016b.

³⁶ Donkey-loads, according to the editor’s reading and restoration; he acknowledges the peculiarity of this notion in the face of the fact that the recipient of the receipt is a camel-driver. The editor’s restoration of ἀπό τῆς Ἐρμού πόλ(εως) after the name of the hypographeus in this text (line 14) seems reckless.

³⁷ P.Kell. 1, 21.

a member of the Hermopolitan elite doing in Kellis? The most obvious answer is that he owned property there and was visiting the oasis for a time in the course of estate management. So probably a significant amount of the produce of the oasis was shipped directly to landlords elsewhere, whether that was Kharga (in the case of Faustianus) or the Nile valley. Such shipments inside the frameworks of estates or on their behalf would coexist with the more entrepreneurial activities visible in the partnership agreements.

From a methodological point of view, I want to stress two lessons that seem to me to emerge from looking at the infrastructure and patterns of communication and distribution for the Great Oasis. One is the fact that the documents offer us both valuable evidence that can, properly analysed, allow structural elements of the economy to emerge, and at the same time they contain tremendous gaps, important aspects barely recorded in the documents or even entirely absent. I am interested here not so much in the fact that various types of archaeological evidence can help us get a more complete picture; this is true, but it is almost a truism. Rather, as a papyrologist I am, as ever, trying to see what our documents do and do not record, and why. Even the accounts and orders for delivery of private estates do not entirely free us from the limits on our knowledge created by the dominance of taxes and rents in the papyrological record. The Kellis account book is richer in this respect than most textual sources, in part because it scrupulously indicates where a tenant substituted one good for another in payments, but it still never refers to millet.

The oases were a distinctive setting and had a peculiar economy and society. Not only did they depend on land transportation to a degree hardly found in Egypt otherwise – apart from the even more peculiar world of the Eastern Desert³⁸ – but the distances involved and the costs of traversing them shaped the local production in ways that would have made no sense in the valley, with its ready access to river transport. It is also likely that the need to dig and maintain wells caused the oases to require more capital investment than most parts of the Nile valley. This in turn, I believe, created a more stratified society than in Egypt proper, dominated by wealthy investors but populated with tenants, managers, and transporters rather than independent farmers owning medium-sized pieces of land.³⁹

None of this leads me to think the lessons from the oases irrelevant to the valley, however. On the contrary, the idiosyncratic characteristics of the oases provide us with an “other” against which to see more clearly the ways in which the economy of the valley functioned. At the same time, the oases obviously provided certain goods of sufficient value to Egyptian society that it was worth paying for the transport costs, and it tells us something about Egypt that this was the case. The investment required in wells and the cost of transportation across the desert were acceptable in comparison to the costs of producing the same goods on high land along the valley. There is important information to be gained from that fact.

If that is correct, however, it raises a question of central importance for the study of the oases, one that I cannot yet answer. It looks as if Dakhla in the fourth century may already have been in decline, compared to a century or two earlier; but in the 360s there seems to be a much sharper falling off, with the abandonment or near-abandonment of a number of sites. What changed in the calculus of production and distribution of the oases’ goods to cause these changes? I cannot go into this question in detail here, but it is unlikely that the oases ran out of water or were so overrun with sand dunes as to be unable to continue production. Did their costs rise, or did those in the valley fall? If so, why? These questions continue to challenge us, and it is not yet clear if documents and archaeology will be able to answer them. But the documents at stake are as much those of the valley as those of the oasis, because the entire infrastructure of irrigation and transportation in the oases can have existed only as a product of the demand for goods and availability of capital in the valley.

³⁸ On which see Cuvigny 2003 and the contribution by Thomas Kruse in this volume.

³⁹ Bagnall 2016a.

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