

V.—Transport Charges in Egypt in the Era of Inflation

O. M. PEARL

UNIVERSITY OF MICHIGAN

P.Mich. Inv. 4607 is one of the papyri recovered at Karanis by the University of Michigan in the season of 1925. It contains a list of boats engaged in the transport of grain on the Nile, with capacities between 1000 and 1400 artabas, and it cites sums for freight charges which give evidence of a high degree of inflation.

The papyrus is broken into three pieces which fit together with slight lacunae. The writing is a clear and somewhat ornate cursive resembling the hand in *PLond.* 3.971 = *Facsimiles* III, 64, which Mitteis (*Chrestomathie*, 95) assigns to the fourth century. The subject matter indicates a date late rather than early in the century; see the end of the discussion. Above the text there is a margin of 2.5 cm.; to the left, of 2.7 cm., and at the right an irregular margin of about 1 cm.

The list is identified as a *μετέκθεσις*. This word has been attested twice, in similar texts, *PCairo Maspero* 2.67138–9, p. 37, 47, and p. 55, 35. In a note to the former passage, Maspero proposed the meaning “payement supplémentaire.” The passages do not oblige this interpretation, and the normal significance of *ἐκθεσις* in accounts seems to refute such a meaning for the compound. In the papyri, this term regularly means “list of arrears,” or simply “arrears,” sometimes merely “list.” The meaning of *μετέκθεσις*, therefore, should be “supplementary list,” i.e., of payments, or “supplementary list of arrears.” Either meaning would be acceptable in the Maspero papyrus, and either may have been intended in Inv. 4607.

The amount of the naulon is 35,000 denarii per artaba (= 23 talents 2000 drachmas). The grain was probably shipped from Ptolemais Hormou to Alexandria. Evidence for the rates of naulon is not abundant and has been altogether lacking for the fourth century and later periods. Two unpublished papyrus fragments from the Michigan collection, both of the third or fourth century A.D., preserve naulon charges, but in neither is there an indication of the distance of the freightage.

Inv. 4650a is a fragmentary text written at the top of a small and damaged strip of papyrus. Below a space ample for one line and traces of another line is the following text:

... λι(τρ)[
 γίν(ονται) λί(τραι) τξα[
 καὶ ναύλου λί(τραι) λ[
 γίν(ονται) λί(τραι) τφα (τέταρτον).

The ratio of the round numbers 30/360 is $1/12$. If the principal sum was $361 \frac{1}{6}$, an exact twelfth would be $30 \frac{1}{12} \frac{1}{72}$. If the small fraction $1/72$ were dropped, the amounts would be: $361 \frac{1}{6} + 30 \frac{1}{12} = 391 \frac{1}{4}$.

Inv. 5262b is a fragment of two columns of an account. Of the text, only two lines of the first column are intelligible:

[πλο]ῖον Ἀνουβίωνος Μέλανος ἀπὸ τοῦ Μεμφίτου
 [κυ]βερνήτου ἀγωγῆς (ἀρταβῶν) σ καὶ ὑπὲρ ν(αύλου) (ἀρτάβας)
 κ, (γίνονται) (ἀρτάβαι) σκ.

The text makes clear that the boat carried a lading of 200 artabas, and that 20 artabas were paid or earmarked for the freight charges; the total involved in the transaction was 220 artabas. The rate is 10%.

The destination of the cargo is not given either in Inv. 4650a or Inv. 5262b. Also, the point of origin is in doubt; although it may have been Karanis, it is more likely to have been a canal port like the Alsos at Arsinoe or a Nile port such as Ptolemais Hormou or Kerke. We have no evidence that the supply canals were used for navigation to points as far within the Fayum as Karanis,¹ while the main canal from Arsinoe to Ptolemais Hormou was a regular route for transport out of the Fayum, in which boats of up to 250 artabas burden were used.²

¹ The only text of direct interest for Karanis is *PAberd.* 36(b), where there is a reference to a *plôtē diôru*, "navigable canal," in a receipt for work on the embankments from Soknopaiou Nesos; for Theadelphia, which lay at a comparable distance from the entrance to the Fayum, see *PPrinceton* 2.40; for Dionysias and Theadelphia, see Youtie *TAPA* 80 (1949) 222-224. In view of the high level at which the supply canals would necessarily have been conducted to reach any of the three villages named, it is improbable, or even impossible, that such canals would have been navigable from, e.g., Ptolemais Hormou to these villages. The same considerations apply to Karanis. On the general subject of canals and indications of location, see *Aegyptus* 31 (1951) 223 ff.

² See the table below (p. 77), and particularly *PLond.* 3.948 (carriage from Arsinoe to Oxyrhynchus) = Mitteis, *Chrestomathie* 341.

The following table collects the scanty evidence on costs of river and canal transport between the third century B.C. and the fourth century A.D.³ No rate can be suggested for Inv. 4607 since it obviously belongs to the period of extreme inflation during the fourth century. Grain prices ranged between 20 and 50 talents per artaba in the period 330–350 A.D. (Segré, *Circolazione Monetaria* (1922) 104–105; Johnson and West (note 3) 175–178), while *PPrince-ton* 3.183 verso (“*ca.* or after 345 A.D.”⁴) gives a price of 334 talents per artaba. Thereafter the price may have increased to as much as four and one-half times the last figure, if it followed the price of gold upward during the latter half of the century (see, e.g., Mick-

³ This collection of the evidence is largely indebted to Homer A. Thompson, *The Transport of Government Grain in Graeco-Roman Egypt* (Diss. Mich. 1929) 114–138, for the material published prior to 1929. Since the work is not generally accessible, this indebtedness is indicated by a general acknowledgment rather than by specific references. Cf. also A. C. Johnson and L. C. West, *Byzantine Egypt: Economic Studies* (1949) 155–163.

⁴ A. C. Johnson, in the letter which called my attention, *inter alia*, to this price. The account on the verso may well be considerably later than the official letter on the recto, which is dated 345 A.D. Cf. now Johnson and West (above, note 3) 177.

⁵ Based *ad valorem* on the extreme prices, 2 dr. and 2 dr. 1 ob. per artaba. See Segré, *Circolazione Monetaria* 100–101.

⁶ Thompson (above, note 3) 114. Other than that it is Ptolemaic, the date of the document is not indicated; hence no rate can be derived with confidence. If the fairly consistent price of 2 dr. per artaba prevailed, the rates would be 6% and 11%, respectively.

⁷ The boat is so large (800 artabas burden) that it could not have voyaged on the Fayum canals. What village on the Nile is meant cannot be determined.

⁸ See the review in *CP* 37(1942) 226.

⁹ This is the stated rate; the amounts paid are slightly less.

¹⁰ Although the phrase “account of Memphis” occurs in the text, the charge seems inadequate for a voyage of 105 miles.

¹¹ The editors’ assumption that the destination was Alexandria is refuted by the rate.

¹² The extreme prices during the second century are 7 dr. and 20 dr. per artaba; see Segré (above, note 5) 102–103. *PSI* 4.281 must be excluded, since the commodity is not specified. For a rate of 3½% for 10½ miles, which may be purely theoretical, see the arithmetical exercise *PMich.* 3.145.

¹³ See A. C. Johnson, *Roman Egypt* 419.

¹⁴ Although vegetable seed is involved, its bulk may have been close to that of wheat. The extreme *ad valorem* rates reckoned as on wheat at 12 and 20 dr. per artaba — the latter the highest price recorded before the serious inflation; see Segré *loc. cit.* (above, note 12) — would be 3½% and 2%.

¹⁵ The computations are based on prices of 12 and 20 dr. per artaba, but these are very uncertain. For these prices see note 14, but 200 dr. per artaba is attested in 276 A.D. — Youtie *TAPA* 76 (1945) 144 f. — and 300 dr. per artaba is recorded *ca.* 293 A.D. in *POxy.* 17.2142.

Date	Text	Point of Origin	Destination	Distance	Charge	Rate
River Transport						
<i>Ca.</i> 250 B.C.	<i>PCorn.</i> 3	Arsinoite nome	Alexandria	226 miles	45 dr. on 100 art.	22½ to 20 ⅝%
Late II B.C.	<i>PTeb.</i> 1,92, introd.	Arsinoite nome	Alexandria	226 miles	8 art. on 100 art.	8% ?
Prolemaic	<i>PLond.</i> Inv. 2093 ^a	Gynaikopolite nome	Alexandria	80 miles	12 dr. on 100 art.	? ?
Prolemaic	<i>PLond.</i> Inv. 2093	Kalchoupolite nome	Alexandria	?	22 dr. on 100 art.	4⅓% to 4½%
155 A.D.	<i>PCol.</i> 2.1 r.4	Arsinoite nome	Boukolôn kômê	?	33⅞ dr. on 100 art.	10% ¹⁰
III/IV A.D.	<i>PMich.</i> Inv. 5262b	Arsinoite nome	?	?	20 art. on 200 art.	8⅓%
III/IV A.D.	<i>PMich.</i> Inv. 4650a	Arsinoite nome	?	?	301½ litres on 361½ litres	?
Late IV A.D.	<i>PMich.</i> Inv. 4607	Arsinoite nome	Alexandria	226 miles	35,000 denarii per art.	?
Lightering or Short Haulage						
188 B.C.	<i>PTeb.</i> 3,847,22 ^a	Arsinoe	Ptolemais Hormou	12 miles	8 dr. on 100 art.	1%
42 A.D.	<i>BGU</i> 3,802.xv.2-3	Arsinoe	Ptolemais Hormou	12 miles	21 dr. on 100 art.	1% ¹⁰
I/II A.D.	<i>POxy.</i> 14,1650	Oxyrhynchus	?	?	on 1000 art.	1% to ⅓ of 1%
II A.D.	<i>POxy.</i> 3,522	Oxyrhynchus	?	?	100 art. on 1730 art. ¹⁸	ca. 3% to 1% ¹²
210 A.D.	<i>PHamb.</i> 1,17,iii.5	Arsinoe	Ptolemais Hormou	12 miles	17½ art. on 250 art.	1%
236 A.D.	<i>PLond.</i> 3,948 (p. 220)	Arsinoe	Oxyrhynchus	60 miles	100 dr. on 600 art.	1% ¹⁴
III A.D.	<i>POxy.</i> 1,180	Oxyrhynchus(?)	?	?		⅓ to ⅓ of 1% ¹⁶

witz, *Geld und Wirtschaft* (1932) 114; A. C. Johnson and L. C. West, *Currency in Roman and Byzantine Egypt* (1944) 158–162).

P.Mich. Inv. 4607 14.7 × 14.6 cm. Latter half of IV century A.D.

μετέχθεσις ἀργυρι <κ> ὧν ναύλων κατα-
πλευσάντων κερκ(ούρων) ἐπὶ τῆς ιεζ' ἰνδικτίονος
οὕτως·

Παχῦμις Φαμπὶν Ληναεῖτης	ἀγ(ωγῆς) (ἀρταβῶν) 'Αν, (δηναρίων) μ(υριάδες) 'Δ
5 'Ἐρπορτοῦνις Παγγαεῖτης	ἀγ(ωγῆς) (ἀρταβῶν) 'Αν, (δηναρίων) μ(υριάδες) 'Δ
Πατνουεῖς Παγγαεῖτης	ἀγ(ωγῆς) (ἀρταβῶν) 'Αν, (δηναρίων) μ(υριάδες) 'Δ
Θεόδωρος 'Αρσᾶς	ἀγ(ωγῆς) (ἀρταβῶν) 'Αν, (δηναρίων) μ(υριάδες) 'Δ
Κοπρίας Ληναεῖτης	ἀγ(ωγῆς) (ἀρταβῶν) 'Αρ, (δηναρίων) μ(υριάδες) 'Γων
Ψόεις "Ωρου 'Αντεοπολ(ίτης)	ἀγ(ωγῆς) (ἀρταβῶν) 'Α, (δηναρίων) μ(υριάδες) 'Γφ
10 'Ατρῆς Κιρκαεῖτης	ἀγ(ωγῆς) (ἀρταβῶν) 'Α, (δηναρίων) μ(υριάδες) 'Γφ
Δίος 'Αντεοπολίτης	ἀγ(ωγῆς) (ἀρταβῶν) 'Α, (δηναρίων) μ(υριάδες) 'Γφ
... ηεις Ληναε[ι]της	ἀγ(ωγῆς) (ἀρταβῶν) 'Α, (δηναρίων) μ(υριάδες) 'Γφ
[] (δηναρίων) [μ(υριάδες)]φ

(Papyrus breaks off)

1. μετέχθεσις: for μετέκ-.

2. κερκ(ούρων): rho is traversed by a slanting stroke; the doubtful kappa is above the line.

4. Φαμπὶν: see *BGU* 1.246.21, where Φαμπεῖν ἀπὸ Σ[(place name?) should be read in place of Φαμπεῖναπος[; cf. also Πανπὶν, Πανπεῖν in *P Mich.* 4, *Tax Rolls from Karanis*, Pt. 2, p. 197.

Translation

Supplementary list (of arrears?) of freight charges in silver for the vessels which made the down voyage during the fifteenth indiction, as follows:

Pachymis, son of Phampin, burden 1,400 artabas 49,000,000 denarii
resident of Lena

Horportounis, resident of Panga	burden	1,400 artabas	49,000,000 denarii
Patnoueis, resident of Panga	burden	1,400 artabas	49,000,000 denarii
Theodorus, son of Arsas	burden	1,400 artabas	49,000,000 denarii
Koprias, resident of Lena	burden	1,100 artabas	38,500,000 denarii
Psoeis, son of Horus, Anteopolite	burden	1,000 artabas	35,000,000 denarii
Hatres, resident of Kirka	burden	1,000 artabas	35,000,000 denarii
Dios, Anteopolite	burden	1,000 artabas	35,000,000 denarii
. . . eeis, resident of Lena	burden	1,000 artabas	35,000,000 denarii