Tony REEKMANS
Professeur à l'Université Catholique de Louvain

A Sixth Century Account of Hay

(P. Iand. inv. 653)

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PREFACE

The existence of this document, which has been purchased in 1926 by Professor C. Schmidt at Medinet el Fayûm, has been first mentioned by Dr. J. Hummel in his *Griechische Wirtschaftsrechnungen und Verwandtes* (*Papyri Iandanae*, fasc. VIII, Leipzig-Berlin, 1938), p. 355, where we read the following note : « Ansehnliche Reste eines Papyruskodex des VI. Jahrhunderts, der das Wirtschaftsbuch eines im Polemonbezirk des Arsinoitengaues gelegenen grossen Gutes mit mehreren Worwerken bildete (*P. Iand.* Inv.-Nr. 653 A-I), von mir gleichfalls bearbeitet, müssen leider hier ausgeschieden und an anderer Stelle veröffentlicht werden. » During the war Dr. Hummel's notes on *P. Iand.* 653 were destroyed ; the papyrus however remained intact and was transferred after the end of the war, together with the other documents of the Janda collection, to the University Library at Giessen. When invited by Dr. H. G. Gundel, Curator of the Papyrus Collections of the Giessen University Library, to resume his work on *P. Iand.* 653, Dr. Hummel had to decline this proposal because of professional duties. In 1952 we accepted Dr. Gundel's invitation to publish the so-called *Wirtschaftsbuch* and a small number of other papyri from the Janda collection (1). We had to rely upon Dr. Gundel's patience until we finally found the necessary time to concentrate on our task which, owing to the fragmentary state of *P. Iand.* 653 and its peculiar methods of accountancy, proved to be very complicated. Although we have been unable to find a solution for all the difficulties that are

(1) Cf. H. G. Gundel, *Kurzberichte aus den Papyrussammlungen der Universitätsbibliothek Giessen*, 9 (1960) pp. 18-19 and note 41. — As the other papyri are dealing with entirely different subjects, and will only require a short commentary, it has seemed preferable not to join them to the publication of the *Wirtschaftsbuch*.

contained in the *Wirtschaftsbuch*, we believe its publication ought not to be delayed any longer. It is our agreeable duty to thank Dr. J. Schawe, Director of the Giessen University Library, for his kind permission to publish this document. We are equally indebted to Professor J. Bingen to whom we owe, in addition to some valuable suggestions, an early printing of our study.

CHAPTER I

THE DOCUMENT

1. Description of the Fragments

The remnants of *P. Iand.* 653 have been skilfully grouped by Dr. H. Ibscher, who succeeded in restoring partly or entirely five strips of papyrus (A, B, C-D (1), E), from which he distinguished four smaller fragments (F, G, H, I). Their measurements will be indicated in the course of our publication.

All fragments are covered, both on recto and verso, with columns whose original width must have varied between 3 cm. and 14 cm. The entire document has been written by a single hand, which may be attributed to the 6th century (cf. Plates I-IV).

On several fragments traces of pricking are visible. They appear very neatly in the left margin of E (cf. Plate I or II : two pairs of little holes), B and A, and again in the middle of C-D (cf. Plate III or IV).

The left edge of fragment E being completely straight (cf. Plate I), there is no doubt that E belonged to the left margin of a papyrus sheet. The other fragments' lateral edges result from desintegration, not from cutting.

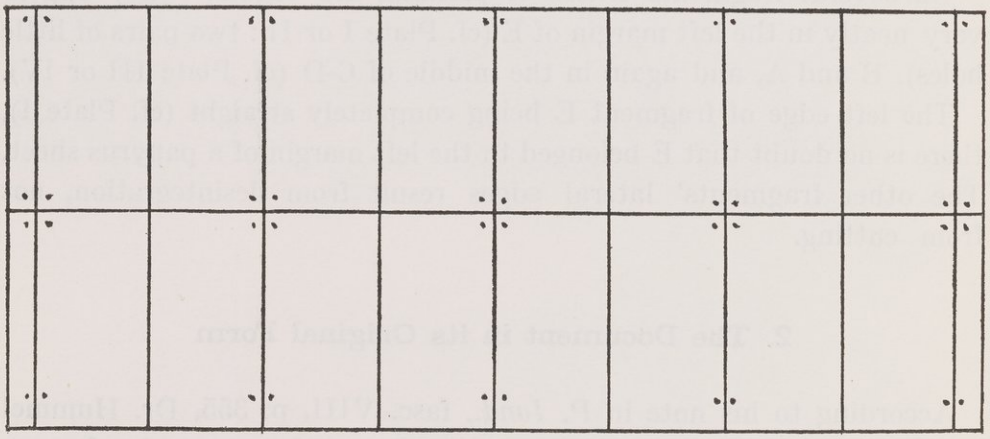
2. The Document in its Original Form

According to his note in *P. Iand.*, fasc. VIII, p. 355, Dr. Hummel seems to have believed that our fragments are the remnants of a papyrus codex. For several reasons this is quite impossible. It will be

(1) Both strips are still connected, at least over part of their height.

sufficient to develop a single argument : according to fragment E the codex would have consisted of a certain number of sheets, fastened together in their left margin, whereas according to fragments C-D the sheets would have been folded into leaves and the codex would have consisted of a number of quires (which, by the way, would have been bound in a very unorthodox and unpractical fashion).

In our opinion the fragments of *P. Iand.* 653 belong to a couple of large sheets, which were folded up individually and sealed. One of these sheets (perhaps both of them) measured 68 × 29 cm. After it had been written on, its height was reduced to 14 + 1 cm. by a horizontal fold at a distance of 15 cm. from the upper edge. Afterwards it was folded lengthwise in two, so that its width was reduced to 34 cm. A second lengthwise fold took place at a distance of 18 cm. from the left edge (resulting width : 16 + 2 cm.), and after a third lengthwise fold the width of the sheet was narrowed to 8 + 2 cm. The 2 cm. margin (lateral margin), which has partly survived in fragment E, did duty as a flap. The document was pricked for sealing close to its top and bottom. If it had been preserved entirely the sheet would look, after being unfolded, as follows :

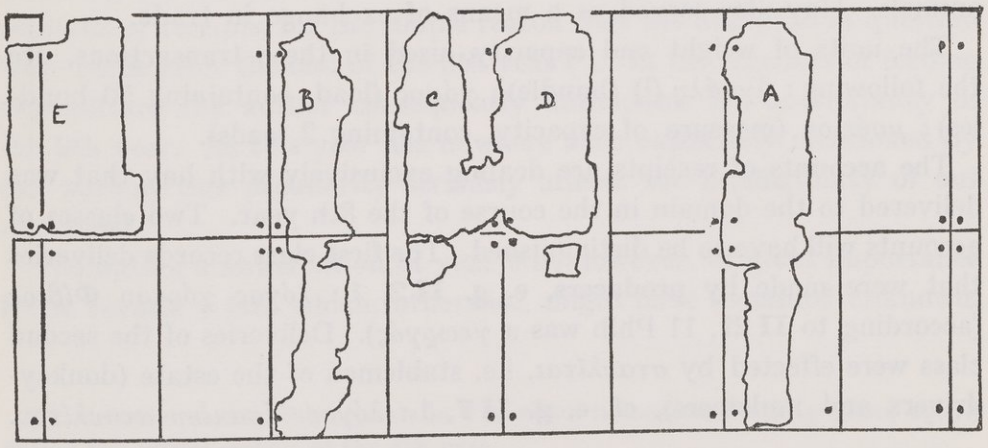


In the course of our study we have mainly been working on excellent photographs, provided by Dr. Gundel. Before we had the opportunity to check our results on the original, we were inclined to believe that

all fragments belonged to a single sheet. Our inspection of the original proved, however, that Dr. Ibscher had had good reasons to put together fragments F-I and to distinguish them from fragments A-E. Fragments F-H are of a slightly darker colour than the other pieces, and their breaks and gaps do not coincide with those that are found in fragments A-E. They consequently cannot have belonged to the same sheet as A-E.

The papyrus sheet which desintegrated into fragments F-I is difficult to restore. It probably was folded and pricked in a similar way as the sheet that has been described above. Fragments F and I seem to have belonged to the lower half of the sheet, fragment G to the upper half. We shall publish these fragments in their alphabetical order. As will be seen on p. 12, the F-I sheet very probably preceded the A-E sheet.

The repartition of fragments A-E over the second sheet can easily be established. Because of the triple lengthwise folding, the sheet has been divided into eight sections (width : 8 cm.), preceded and followed by a 2 cm. margin. Although this sheet has suffered less damage than the previous one, substantial parts of it are missing :



Initial 2 cm. margin : upper half preserved in fragment E.
1st section : upper half preserved in fragment E.
2nd section : completely lost.

3rd section : as far as its writing is concerned, almost completely preserved in fragment B.
4th section : upper half and part of lower half preserved in C.
5th section : idem, in fragment D.
6th section : completely lost.
7th section : almost completely preserved in fragment A.
8th section : completely lost.
Final 2 cm. margin : completely lost.

All sections have been separated one from another by corrosion, except the initial 2 cm. margin, which is still connected with the 1st section, and sections 4 and 5 (cf. Plate III or IV), which form the central part of this sheet.

3. Survey of the Contents

P. Iand. 653 is an account of receipts and expenditure of hay. Our document has been written in the accountancy office of a private estate ; it deals, at least in principle, with the 8th year of an indiction cycle. The provisions of hay were obtained from various sources (local production, related domains, purchase) and fed to different troops of animals. Hay also served as a means of exchange in trade.

The units of weight and capacity, used in these transactions, are the following : *ἀγκάλη* (1) (bundle) ; *γόμος* (load, containing 50 bundles) ; *μούειον* (measure of capacity, containing 2 loads).

The accounts of receipts are dealing exclusively with hay that was delivered to the domain in the course of the 8th year. Two classes of accounts will have to be distinguished. The first class records deliveries that were made by producers, e. g. **II 2**, 1 : *λόγος χόρτου Φίβιος* (according to **II 21**, 11 Phib was a *γεωργός*). Deliveries of the second class were effected by *σταυλῖται*, i.e. stablemen of the estate (donkey-drivers and muleteers), cf. e. g. **II 7**, 1 : *λόγος Ἰσακίου σταυλίτου*.

(1) Although this term occurs very frequently (always in abbreviation), our reading is not certain. Whatever the solution of the abbreviation may be, it certainly meant « bundle ». Several examples of the abbreviation will be found on Plates III-IV. It is written in slightly different ways.

The first class of accounts of receipts deals with deliveries for various purposes, the second class always concerns provisions which would be consumed by a single troop of animals. There is a further distinction between the two classes : deliveries of the first class are usually dated, those of the second class on the contrary not. It is not clear where the σταυλῖται obtained the provisions that are listed in the second class.

The accounts of expenditure are equally to be subdivided into two classes. The first class deals with expenditure made during the 8th year in trade operations (barter). Only one account of this kind has been preserved (**II 15**). Accounts of expenditure of the second class relate the keeping of animals on hay, and usually contain the following items : kind and number of animals — daily ration per head — daily consumption of the troop in question — period during which hay was fed — total consumption — receipts for the following period. A few accounts (**II 14**, **II 21**) mention, after the total of consumption, a total of receipts and their surplus. Most of the accounts of feeding expenditure deal with a period starting on 1st, 5th or 7th Pharmouthi, and ending on 14th, 15th or (most frequently) 30th Payni. These are the accounts which contain, at the end, of survey of « receipts for the following period » (1), whose items are not mentioned in any of the *accounts of receipts*, for the simple reason that the deliveries in question were made after the end of the 8th year (2). In his accounts of feeding expenditure the author consequently anticipates his accountancy of the 9th year. As this year has nowhere been explicitely mentioned by our author, this peculiarity seriously affects the intelligibility of our document.

The author's anticipation of year 9 is, however, of great importance for it reveals a fact which, otherwise, might have remained unknown.

(1) A similar survey also appears in **I 6**, which is concerned with χορτικὴ τροφή during the *initial months* of the 8th year.

(2) In Egypt the indiction year began at a variable date, situated between the end of Pachon and the end of Epeiph. Cf. L. Mitteis - U. Wilcken, *Grundzüge und Chrestomathie der Papyruskunde*, I. 1, p. LX. In our document the last day of the 8th year seems to have been 30th Payni.

If the donkeys and foals that are dealt with in **II 14** and the mules of **II 18** have been fed on hay during Epeiph of the 9th year, there is no reason why this should not also have been the case during Epeiph of the 8th year. Except for four accounts (**I 6**, **II 6**, **II 16** and **II 19**, 2-4) there is, however, no question of hay feeding during the initial months of the year (Epeiph-Hathyr). Although we would feel much more certain if **II 6**, **II 16** and **II 19**, 2-4 were absent from sheet A-E, we would like to assume that sheet F-I, which has been preserved in a very poor state, was concerned with receipts (1) and expenditure (2) during the first part of the 8th year, whereas sheet A-E seems to have dealt, at least in principle, with transactions and consumption of the second part of the year (Choiak-Payni). The presence on sheet A-E (henceforth we shall call it sheet II) of the above mentioned accounts (3) apparently intends to repair omissions of sheet F-I (sheet I).

One would expect the author to separate on both sheets the accounts of receipts from the accounts of expenditure. This may have happened on sheet I, of which we know too little to assert the contrary, but it certainly has not been the case on sheet II. This sheet opens with a number of accounts of receipts belonging to the first class (cf. p. 10), and goes on with a similar account of the second class (**II 5**), followed by a related account of expenditure (**II 6**). Next come two further accounts of receipts of the second class (**II 7** and **8**), followed again by a related account of expenditure (**II 9**). Between **II 9** and **10** a narrow account has been lost : it probably dealt with the provisions from which the expenditure, mentioned in **II 10**, was made. The next account (**II 11**) is again an account of receipts of the second class ; its related document seems to have disappeared together with the rest of the 8th section. Next comes a total of 2167 *mouia*, containing c. 1670 *mouia* obtained from To Skelos, c. 420 *mouia* from Kusis (?),

(1) Only two accounts of receipts, belonging to sheet F-I, are dated. Both concern the initial months of the year (**I 1** and **I 2**).

(2) The only account of expenditure of this sheet (**I 6**) concerns *χορτικὴ τροφή* during the first months of the 8th year.

(3) They all concern the maintenance of *βόες*.

49 *mouia* from Tali and 13 *mouia* from Bousiris (**II 12**). In our opinion these 2167 *mouia* are the sum total of deliveries of the first class, recorded in the first, second and third section of the sheet. On the verso of sheet II we first find a series of accounts of expenditure (**II 13-20**) ; the expenses, whose total amounts to 2082 1/5 *mouia*, were covered by the above mentioned 2167 *mouia*. The following accounts of expenditure (**II 21** and **22**) do not seem to have been preceded by any related accounts of receipts (1). In **II 23** the author seems to have calculated the sum total of the expenses that were recorded on sheet II, whereas the last account of the verso (**II 24**) is an account of receipts which should normally have appeared on the verso of the 8th section.

(1) The expenses recorded in **II 21** seem to have been covered by receipts mentioned in **I 6**, 10-13. Cf. our commentary on **I 6**.

CHAPTER II

THE PRIVATE ESTATE AT TO SKELOS

1. Extension and Connections of the Estate

The centre of activities and transactions described in our document was situated at *Τὸ Σκέλος*, a village of the Arsinoite nome (1). This may safely be concluded from the headings of a few accounts (2) and also from the fact that the main part of the 2167 *mouia* of hay, mentioned in **II 12**, was derived from To Skelos. Our document does not concern the entire village, but merely a domain situated within its territory. This may be deduced from **I 1**, 9 and **II 2**, 10, where the adjective *γεουχικός* occurs.

The extension of the domain situated at To Skelos seems to have been quite important. It must, first of all, have contained a large area of meadows, for its production of hay appears to have been very considerable. Although we ignore the total of local production of hay, some idea about its extent may be derived from **II 12**, 2, which refers to some 1670 *mouia* obtained from the domain a To Skelos. According to our calculations on p. 31, n. 2, 1670 *mouia* must be equivalent to c. 66.800 kilogrammes. The number of *βόες* that were kept at the estate during the ploughing season may give us an idea of the area of arable land. Four troops of *βόες* are mentioned in our document. The first (18 animals) is dealt with in **II 5** and **6** (consumption of hay during Thoth, Phaophi, and possibly also Hathyr) and probably also in **II 11** (provisions for Pharmouthi-Payni). The second and third

(1) Cf. the list of Arsinoite villages in *P. Tebt. II*, p. 402.

(2) Cf. **I 1**, 1 : *τροφὴ Σκελαίων ζώων* ; **II 5**, 1 : *τροφὴ βοῶν Σκελαίων* ; **II 11**, 1 : *λόγος χορτικῆς τροφῆς βοῶν Σκελαίων*.

troop (respectively 6 and 17 animals) appear in **II 16** (consumption from 24th/26th Phaophi until 30th Hathyr, and again from 5th Pharmouthi until 15th Payni); the fourth (11 animals) is dealt with in **II 19** (consumption from 20th Thoth until 30th Hathyr, and from 1st Pharmouthi until 15th Payni). In order to avoid any overrating of the area of arable land at the domain of To Skelos, we shall assume that only the second and third troop were actually engaged in ploughing during the appropriate season (Phaophi-Hathyr). Their total number ougth to be reduced from 23 to 20, for three of these animals died soon after 24th Phaophi (cf. **II 16**, 8 and **II 19**, 9-10). Although Columella, *De Re Rustica*, II. 12. 8, deals with Italic conditions, he may give us an idea of the work that has been effected by the oxen of *P. Iand.* 653 : *semina quae quarto sulco seruntur in iugeribus viginti quinque desiderant bubulcorum operas centum decem et quinque* (1) ; *nam proscinditur is agri modus, quamvis durissimi, quinquaginta operis, iteratur quinque et viginti, tertiatur et conseritur quadraginta.* Assuming that the two troops of *βόες* carried out, in the course of 35 days of labour, a single ploughing, equivalent to Columella's *proscissio*, we obtain a total of 175 *iugera* = 160 *arourae* (2). The number of animals engaged in transport (e. g. a troop of 14 donkeys, two troops of mules, of respectively 14 and 20 animals) may strengthen our opinion about the importance of the domain at To Skelos.

To its proprietor the domain situated at To Skelos was much less important than it may seem to us, for it was only a small part of the possessions he owned in the Arsinoite nome. This may be derived from the following facts. During the initial months of the 8th year, and again at the beginning of the 9th, provisions of hay were obtained from various villages : Bousiris, Tou Melitonos, *Μαντ( )*, Tali, Mouchis, Thanekos and Kek (uncertain reading). Although, during the second part of the 8th year, consumption of hay has mainly been

(1) 115 days' labour of the ploughmen ; the context shows that Columella is thinking of a single yoke of oxen, cf. II. 12. 7 : *quae nos ratio docet sufficere posse i u g u m b o v u m tritici centum viginti modiis totidemque leguminum.*

(2) 1 *iugerum* = 2523 m² ; 1 *aroura* = 2756 m².

covered by local production, provisioning from outside continued to a certain extent, and some 420 *mouia* were obtained from Kusis, 49 from Tali, 13 from Bousiris (1). Only a very small part of these provisions have been specified as being *χόρτος ἀγοραστός*; they are all recorded in **I 1**. Unless we assume that, in spite of the absence of *χόρτος ἀγοραστός* from subsequent accounts, our entire document deals with provisions that had been bought, we ought to conclude from the restriction of *χόρτος ἀγοραστός* that, as a rule, provisions from other villages were not purchased, but received, which means that they were obtained from related domains. The affinity between the domain at To Skelos and the other villages had already been observed by Dr. Hummel (cf. *P. Iand.*, fasc. VIII, p. 355), who seems to have believed that the private estate of To Skelos possessed in the above mentioned villages a series of dependent farms.

Bousiris, Mouchis and Tali belonged to that part of the Arsinoite nome which had previously been called the Division of Polemon (2). As for To Skelos, Tou Melitonos and Thanekos, we only know that they were situated in the Arsinoite nome (3). Kusis is the name of a village in the Great Oasis (provenance of *P. Grenfell* II 68-78) which can hardly be identical with the village of **II 12**, 3; there may have been a second village of this name in the Arsinoite nome. *Μαντ*( ) and Kek (uncertain reading) are not mentioned in the geographical section of Preisigke's *Wörterbuch*.

2. The Troops of Animals Kept by the Estate.

Thirteen different troops of animals are dealt with in our document. In twelve cases we know, either from the text or from the context, what kind of animals was concerned.

(1) Part of these provisions, namely those which would be fed to *βόες* during the initial months of the year, have been delivered during the first part of the year. An example is available in **II 1**, 11, cf. our commentary *a. l.* p. 48.

(2) Cf. *P. Tebt.* II pp. 374, 390, 402.

(3) Cf. *P. Tebt.* II pp. 378, 389, 402.

βόες (1)

First troop :

accounts of receipts : **II 5** ; **II 6**, 4-6 ; **II 11**.

accounts of consumption : **II 6**, 1-3 ; account lost in section 8, recto.

18 animals (cf. comm. **II 6**).

Second troop :

accounts of receipts : **II 12** (general account), **II 24** (year 9).

accounts of consumption : **II 16** ; lost account of section 8, verso.

6 animals.

Third troop :

accounts of receipts and consumption : cf. 2nd troop.

17 animals.

Fourth troop :

II 19 refers to a daily consumption of 4 *gomoi* 20 *ankalai* (= 220 *ankalai*) from 20th Thoth until 12th Phaophi ; a consumption of 4 *gom.* 14 *ank.* (= 214 *ank.*) from 13th Phaophi until 30th Hathyr, and again from 1st Pharmouthi until 15th Payni ; a consumption of 4 *gom.* 9 *ank.* from 16th Payni until 30th Hathyr of the 9th year. The indication of the kind of animals concerned is lost. The amounts of daily consumption may be interpreted in two different ways :

a. 220 *ank.* : 20 animals, receiving each a daily ration of 11 *ank.*
214 *ank.* : 20 animals ; daily ration of c. 10 1/2 *ank.*
209 *ank.* : 19 animals ; daily ration of 11 *ank.*

b. 220 *ank.* : 11 animals ; daily ration of 20 *ank.*
214 *ank.* : 11 animals ; daily ration of c. 19 1/2 *ank.*
209 *ank.* : 11 animals ; daily ration of 19 *ank.*

(1) It has seemed preferable not to translate this term which, in our document, may refer to cows as well as to oxen.

In the first case the daily rations per head would refer to a troop of asses (cf. infra), in the second to a troop of *βόες*. We have adopted the second solution, mainly because the other cases in which sheet II is dealing with consumption of hay during the initial months of the year concern, without any exception, the keeping of *βόες*.

Account of receipts : **II 12** (general account).

Bulls :

First troop :

account of receipts : **I 6**.

accounts of consumption : **I 6** ; **II 21**.

7 animals.

Second troop :

II 17 mentions a daily consumption of 3 *gomoi* 25 *ankalai* by a certain troop of animals. This amount obviously refers to a troop of 7 animals, receiving a daily ration of 25 *ank.* per head. As **II 21** deals with a team of 7 bulls, consuming 3 1/2 *gomoi* a day, our account very probably concerns a second troop of bulls, containing again 7 animals.

Account of receipts : **II 12** (general account).

Asses :

First troop :

accounts of receipts : **II 7** ; **II 8**

account of consumption : **II 9**

14 + 4 animals.

Second troop :

account of receipts : **II 12** (general account)

account of consumption : **II 14**

3 + 2 animals.

Mules :

First troop :

account of receipts : **II 12** (general account)
account of consumption : **II 18**
14 + 6 animals.

Second troop :

II 10 deals with the keeping of a troop of animals receiving a daily ration per head of 24 *ank.* during the period 7th Pharmouthi - 24th Pachon. From then onwards until 30th Payni the daily ration was reduced to 20 *ank.* As these are the same rations as those that are mentioned in **II 18**, the present account probably concerns another troop of mules. It contained 14 + 1 animals.

Account of receipts : lost account of section 6, recto.

Foals :

account of receipts : **II 12** (general account)
account of consumption : **II 14**.
3 animals

Camels :

In **II 13** we find the following situation : from 7th Pharmouthi until 24th Pachon a certain troop of animals consumed 1 *gom.* 10 *ank.* a day ; its consumption increased to 1 *gom.* 25 *ank.* from 25th Pachon onwards until 30th Payni. *If* the daily ration has remained the same throughout the entire period of *χορτικὴ τροφή*, it must have amounted to 15 *ank.*, and the troop in question must have consisted originally of 4, later of 5 animals. Daily rations of 15 *ank.* have been given to the second troop of asses (cf. **II 14**). Instead of conjecturing the existence of a third troop of asses, we are rather inclined to believe that this account dealt with a troop of camels. It appears from **I 2** that camels were kept at the domain of To Skelos.

Account of receipts : **II 12** (general account).

Uncertain case :

In **II** 22, 1 we are unable to read the information about consumption. It is therefore impossible to make any conjecture about the kind of animals concerned in this account.

The dates after which similar troops of animals were fed on hay do, as a rule, not entirely coincide. We shall give a few examples :

βόες :

1st troop :	
Thoth-Phaophi-Hathyr (?) **II** 6	5th or 7th Pharm. - 30th Payni lost account of sect. 8
2nd troop :	
24th Phaophi - 30th Hathyr **II** 16	5th Pharm. - 30th Payni. **II** 16, 1
3rd troop :	
26th Phaophi - 30th Hathyr **II** 16	5th Pharm. - 30th Payni **II** 16, 1
4th troop :	
20th Toth - 30th Hathyr. **II** 19	1st Pharm. - 15th Payni. **II** 19

Bulls :

1st troop :	
no clear information. **I** 6	1st Pharm. - 14th Payni. **II** 21
2nd troop :	
no information	7th Pharm. - 30th Payni. **II** 17

Asses :

1st troop :	
no information (1)	1st Pharm. - 30th Payni. **II** 9

(1) A few details may be derived from a study of the accounts of receipts. They will be mentioned on p. 24.

2nd troop :
no information 7th Pharm. - 30th Payni. **II 14**

Mules :

1st troop :
no information 1st Pharm. - 30th Payni. **II 18**

2nd troop :
no information 7th Pharm. - 30th Payni. **II 10**

It should also be noticed that the accounts of *χορτικὴ τροφή* during *5th of 7th Pharmouthi* - 30th Payni have been grouped by the author of our document (**II 10-17**). The accounts referring to the period extending from *1st Pharmouthi* until 14th, 15th or 30th Payni are the following : **II 9**, **II 18-20** (in which the reckoning is continuous), **II 21** and possibly also **II 22**.

The distinction of two or more troops of the same animals and the fact that they were fed on hay after slightly different dates could easily be explained if there were any indication that the animals were kept and working on different parts of the estate (1).

It has been noticeable already that the number of animals belonging to a certain troop did not remain invariable. Apart from the fact that the effectives of the 2nd and 3rd troop of *βόες* were reduced from 23 to 20 animals owing to the death of three of them soon after 24th Phaophi (2), it should be noticed explicitely that some troops had their effecives increased during Pharmouthi-Payni. These are the data :

1st troop of asses : 14 animals until 30th Pachon,
II 9 18 animals from 1st Payni onwards.

(1) We have long thought that the details of **II 12** did not concern the villages from which hay was obtained, but the places where it was delivered and consumed. It is, however, impossible to divide the troops that appear in **II 13-20** into four groups whose consumption would have amounted to c. 1670, c. 420, c. 49 and c. 13 *mouia*.

(2) They were not replaced.

2nd troop of asses :	3 animals	until 26th Pachon,
II 14	5 animals	from 27th Pachon onwards.
1st troop of mules :	14 animals	until 30th Phamenoth,
II 18	20 animals	from 1st Pharmouthi onwards.
2nd troop of mules :	14 animals	until 24th Pachon,
II 10	15 animals	from 25th Pachon onwards.
troop of camels :	4 animals	until 24th Pachon,
II 13.	5 animals	from 25th Pachon onwards.

The reason why these troops were strengthened is obvious. The period extending from the beginning of Pharmouthi until the end of Epeiph was marked by great agricultural activities : harvesting (1), threshing, transport of agricultural products, work at the mill. Most of the above mentioned animals were undoubtedly used for transport ; some of the asses may have been used in the mill, or even on the threshing floor (2). In one case (1st troop of asses) the additional animals were bought (3) ; as a rule, however, they were probably borrowed from other domains, belonging to the same proprietor.

It seems likely that after the end of the main agricultural season some of the animals were disposed of. The accounts of expenditure, which are on the whole rather laconic about what happened after the end of Payni (end of the 8th year), do not give any information on this point. There is, however, an isolated note (**II 3**), relating the sale of animals. It has, unfortunately, not been dated.

(1) Cf. M. Schnebel, *Die Landwirtschaft im hellenistischen Aegypten*, Munich, 1925, p. 164.

(2) Cf. M. Schnebel, *o. c.*, p. 175.

(3) Cf. also **II 3**, 2.

CHAPTER III

ΧΟΡΤΙΚΗ ΤΡΟΦΗ

1. The Periods of χορτικὴ τροφή

From the beginning of Pharmouthi until the end of Payni, all troops of animals that were kept at To Skelos appear to have been fed on hay. During the immediately preceding months (1st Choiak - 30th Phamenoth, i.e. 27th November - 26th March) there is, on the contrary, no question of *χορτικὴ τροφή*. What happened during the initial months of the 8th year is not clear, because sheet I, which probably dealt with the first part of the year, has been very badly preserved. The situation at the beginning of year 8 may be conjectured to a certain extent from a few accounts of expenditure belonging to sheet II, from details about *deliveries* which took place at the beginning of the 8th year, and also from the author's anticipation of the 9th year (cf. p. 11) :

Initial months of the 8th year	*Anticipation of the 9th year*
βόες 1 :	
consumption on 7th Thoth, cf. **II 6**, 1.	consumption during the beginning of year 9 was probably dealt with in the lost account of section 8, recto.
deliveries : before 7th Thoth, cf. **II 5** ; on 14th, 23rd, 25th Phaophi, cf **II 6.**	
βόες 2 :	
consumption : 24th Phaophi - 30th Hathyr, cf. **II 16.**	deliveries on account of the 9th year, cf. **II 24** (no dates preserved)
deliveries : 18th Epiph, cf. **II 1**, 11.	

βόες 3 :	
consumption : 26th Phaophi - 30th Hathyr, cf. **II 16.**	idem.
deliveries : 18th Epiph, cf. **II 1**, 11.	
βόες 4 :	
consumption : 20th Thoth - 30th Hathyr, cf. **II 19.**	consumption : 16th Payni - 30th Hathyr, cf. **II 19**, 7. deliveries in Payni, cf. **II 20.**
Bulls 1 :	
deliveries : 7th Epeiph - 20th Thoth and 15th Payni - 17th Phaophi, cf. **I 6** ; cf. also erased entries in **II 1**, 5 and 12.	consumption after 14th Payni, cf. **II 21**, 14.
Bulls 2 :	
no information	probably : consumption after 30th Payni, cf. **II 17.**
Asses 1 :	
deliveries : 15th and 25th Epeiph, 6th and 29th Mesore, cf. **I 2** ; cf. also erased entry in **II 1**, 6 (30th Mesore)	deliveries from 8th Epeiph until at least 28th Phaophi, cf. **II 9.**
Asses 2 :	
no information	consumption during Epeiph, cf. **II 14**, 5
Mules 1 :	
no information	consumption during Epeiph, cf. **II 18**, 5

Mules 2 :	
no information	consumption after 30th Payni, cf. **II 10**, 5.
	deliveries in Epeiph, cf. **II 10**, 6.
Foals :	
no information	consumption during Epeiph, cf. **II 14**, 5
Camels :	
deliveries : 24th Epeiph, cf. **I 2**	probably : consumption after 30th Payni, cf. **II 13**, 3
Uncertain troop :	
no information	deliveries from the beginning (?) of Epeiph, until at least 19th Mesore, cf. **II 22**.

As opposed to the final months of the year (Pharmouthi-Payni), the extension of *χορτικὴ τροφή* during the initial months of the year (Epeiph-Hathyr) appears to have been different from one troop to another.

The situation seems to have been as follows. From 1st Choiak until 30th Phamenoth (27th November - 26th March) all the animals of the estate were either pastured (this applies to the animals that were not engaged in agricultural work) or fed on green forage in their stables (this was the case with working animals). From the beginning of Pharmouthi onwards until the end of Hathyr (i.e. the end of March until the end of November) the pasture-land and the meadows of the estate were closed, which means that the animals of the domain were to be kept on dry forage. During the first three months of this period the entire live stock was kept on hay which, to a large extent, had been produced locally. From the end of Payni onwards local provisions became insufficient, and even the supplies that arrived from other villages (either from the market or from related domains) could not

cover the needs of a general *χορτικὴ τροφή*. During the period extending from 1st Epeiph until the end of Hathyr hay was consequently replaced to a large extent by other kinds of fodder. From Epeiph onwards its distribution seems to have been determined by : 1) the general trend of provisioning from outside, 2) the specific requisites of the animals that were to be fed, 3) the kind of work in which they were engaged. This explains why the picture is different from one troop to another.

The period during which the animals of the estate were pastured or kept on green forage (end of November until the end of March) is shorter than the grazing-period in modern Egypt, which, according to M. Schnebel (1), extends from December until June.

The fact that, during the period extending from 1st Epeiph until 30th Hathyr, *χορτικὴ τροφή* became very restricted in comparison with the previous months (Pharmouthi-Payni), can hardly be explained as the result of a rational choice between various kinds of fodder. Difficulties incurred in connection with the provisioning of hay are a well known topic of Greek papyrology, and a phenomenon of all times, cf. *PCZ* 59591 (middle of the 3rd century B.C.), *P. Mich. Zen.* 21 (257 B.C.), *PSI* 356 (253-2 B.C.), *P. Oxy.* 1482 (2nd century A.D.), *PSI* 286 (3rd or 4th century A.D.), *P. Oxy.* 938 (late 3rd or 4th century A.D.).

2. The Daily Rations and their Weight.

P. Iand. 653 contains interesting details about daily rations of hay. These are the data :

II 16 2nd troop of *βόες* :
24th Phaophi - 30th Hathyr 20 *ank.* per head
3rd troop of *βόες* :
26th Phaophi - 30th Hathyr idem

(1) Cf. Schnebel, *o. c.*, p. 343 : « das Vieh weidet von Dezember bis Juni auf den Kleefeldern. »

II 19 4th troop of *βόες* :

20th Thoth - 12th Phaophi	20 *ank.* per head
13th Phaophi - 30th Hathyr	c. 19 ½ *ank.* per head
1st Pharmouthi - 15th Payni	idem
16th Payni - 30th Hathyr	19 *ank.* per head

II 21 1st troop of bulls :

1st Pharmouthi - 14th Payni	25 *ank.* per head

II 17 2nd troop of bulls :

7th Pharmouthi - 30th Payni	idem

II 9 1st troop of asses :

1st Pharmouthi - 30th Pachon	
14 animals	12 *ank.* per head
1st Payni - 30th Payni	
18 animals	12 *ank.* per head

II 14 2nd troop of asses :

7th Pharmouthi - 26th Pachon	
3 animals	15 *ank.* per head
27th Pachon - 30th Payni	
5 animals	15 *ank.* per head

II 18 1st troop of mules

1st Pharmouthi - 30th Payni	
14 animals	24 *ank.* per head
additional 6 animals	20 *ank.* per head

II 10 2nd troop of mules

7th Pharmouthi - 24th Pachon	
14 animals	24 *ank.* per head
25th Pachon - 30th Payni	
15 animals	20 *ank.* per head

II 14 troop of foals

5th Pharmouthi - 30th Payni	25 *ank.* per head

II 13 troop of camels

7th Pharmouthi - 24th Pachon	
4 animals	15 *ank.* per head

25th Pachon - 30th Payni
5 animals 15 *ank.* per head

A few points will have to be noticed. The reinforcement of a troop appears to have led, at least in some cases, to a reduction of rations. This is the case with both troops of mules : in **II 18** the newcomers received 20 instead of 24 bundles ; in **II 10** the arrival of an additional mule led to a general reduction of rations (20 bundles instead of 24 before). The reason why the daily rations of the 4th troop of *βόες* were reduced after 12th Phaophi cannot be guessed ; a second reduction (after 15th Payni) is easier to explain. From 1st Pharmouthi until the end of Payni the animals kept by the estate werd mainly fed on local provisions (cf. p. 25), whereas, from Epeiph onwards, their stablemen had to rely mainly on deliveries from related domains. The reason why, from 16th Payni until 30th Hathyr, the rations of the 4th troop of *βόες* were reduced, was probably the same as that which, at the end of year 7 and the beginning of year 8, led to the purchase of hay, namely the gradual exhaustion of local provisions, the slow start of provisioning from related domains and its insuffiency. A last point to be mentioned concerns the feeding of the asses : the first troop (*ὑποζύγια ζῷα ὀνηλατῶν*) received a daily ration of 12 bundles per head, the second (*ὑποζύγια ζῷα γεουχικά*) 15 bundles per head. The difference could probably be explained if we knew what kind of work was done by these animals.

How much did an *ἀγκάλη* weigh? According to **II 20**, 9 and 12 the bearing-power of an ass was 4 *gomoi* = 200 *ankalai*. This explains why the amount of most deliveries of hay constitutes a multiple of four. The *gomos* of our document seems to have been equivalent to the *φορτίον* or earlier times, for according to *BGU* 1502 (end of the 3rd century B.C.) a certain number of asses, engaged in the transport of hay, carried 4 *phortia* each (1). As a *phortion* of hay contained 20 *δέσμαι διμναῖοι* (2),

(1) *BGU* 1502 in one case attributes the transport of 16 *phortia* to three (instead of four) asses. Two of these animals probably made a single expedition, whereas their companion made a double journey.

(2) Cf. *P. Cairo Zenon*, vol. III, p. 113.

we ought to be able to calculate its weight. The adjective *διμναῖος* (1) may refer to the so-called *πτολεμαϊκὴ μνᾶ*, which, according to ancient metrological authors, was equivalent to 1 ½ Roman pounds (2). A *δέσμη διμναῖος* would consequently have weighed 3 Roman pounds = 982 grammes, and a *phortion* or *gomos* (at least the *gomoi* of our document) 20 × 982 grammes = c. 20 kilogrammes. The bearing-power of an ass would have amounted to c. 80 kg of hay. If our calculation is exact, the *ankalai* of our document must have weighed c. 400 grammes (3), at least in theory, for it is clear that bundles of hay (even when then were called *διμναῖοι*) were never weighed on scales.

The elements of our calculation are supported by the following facts. 1) Columella, *De Re Rustica*, XI. 2. 40 speaks of bundles of hay, weighing 4 pounds apiece : *per hos dies runcandae segetes sunt, faenisciae instituendae. Bonus operarius prati iugerum desecat, nec minus mille ducentos manipulos unus alligat, qui sint singuli quaternarum librarum.* 2) According to U. Wilcken (4) and M. Schnebel (5), an ass could carry 3 artabae of wheat ; as the 40 *choinikes* artaba (i. e. the most usual) contained c. 40 litres, and a litre of wheat has a weight of c. 670 grammes, this means again a bearing-power of c. 80 kg.

Account **II 2**, 6, 8 and 11 seems to refer to deliveries consisting of *gomoi* which contained 20 *ankalai* each. The first delivery amounted to 66 *gomoi*, the second and third to 67 *gomoi*. As there is no conversion of these loads into the usual 50 *ankalai gomoi*, we must assume that their weight was the same as that of the latter. This means that the bundles they contained must have weighed 2 ½ times as much as the

(1) The term is applied to bundles (*δέσμαι*) of hay in Ptolemaic and early Roman documents, cf. *PCZ* 59645 (middle 3rd cent. B. C.), *PCZ* 59723 (same period), *PSI* 400 (same period), *P. Petrie* III 61 (226 B. C), *P. Tebt.* 843 (152 B. C.), *P. Rylands* 183 (16 A. D.).

(2) Cf. F. Hultsch, *Die Gewichte des Altertums nach ihrem Zusammenhange dargestellt*. Abhandl. Sachs. Ges. Wissensch. 182 (1898) p. 45.

(3) A *gomos* contained 50 *ankalai*.

(4) U. Wilcken, *Griechische Ostraka aus Aegypten und Nubien*, Leipzig-Berlin' 1899, vol. I, p. 754.

(5) M. Schnebel, *o. c.*, p. 338.

usual *ankalai*. The *δέσμαι διμναῖοι* of Ptolemaic and Roman times have lost their name, but they seem to have survived.

We may conclude from this that the term *ἀγκάλη* merely meant « bundle » and had not become a metrological term (1). The same is true of the terms *δέσμη*, *δέμα*, *δράγμα*. Similarly the term *γόμος* merely signified a beast's load. To the stablemen of To Skelos the term *ἀγκάλη* undoubtedly meant a bundle of a definite weight (the lighter one) and the donkey-drivers of the estate and its related domains surely had no divergent ideas about the weight of a *gomos* of hay. But is is likely that the metrological implication of these terms was only understood in a relatively small circle.

The term *μούειον* on the contrary seems to refer to a well established measure of capacity (2). If *mouion* had kept its original meaning of « receptable, box » (3), there would have been no reason to convert a total of *gomoi* into a total of *mouia*, for the generally accepted meaning of the latter term would have been just as vague as that of the former.

We shall now convert the rations, recorded in our document, into kilogrammes. The *ἀγκάλαι* will be reckoned at 400 grammes, cf. supra.

2nd and 3rd team of *βόες*	20 *ankalai* per head	= 8 kg
4th team of *βόες*	20 *ankalai*	= 8 kg
	19.45 *ankalai*	= 7,78 kg
	19 *ankalai*	= 7,6 kg
1st team of asses	12 *ankalai*	= 4,8 kg
2nd team of asses	15 *ankalai*	= 6 kg
both troops of mules	24 *ankalai*	= 9,6 kg
	20 *ankalai*	= 8 kg

(1) In *P. Oxy.* 1049 (late 2nd cent. A. D.) a *μανδάκη* contains 43 *ἐξάγκαλα* ; in *SB* 1959 (3rd cent A. D.) it is reckoned at 50 *ἀγκάλαι*.

(2) This word, of Egyptian origin, is also spelled *μώϊον*. In connection with deliveries of hay the term appears in the following documents : *O. Tait Bodl.* I, 230-241, 253 and 342 (2nd cent. B. C.), *O. Tait Bodl.* I, p. 64 = *SB* 3568 (2nd cent. B. C.), *P. Oxy.* 1734 (2nd-3rd cent. A. D.), *PSI* 808 (3rd century A. D. ?), *P. Rendel Harris* 159 (5th-6th cent.), *P. Oxy.* 146 (555), *P. Oxy.* 2046 (6th cent.).

(3) Cf. *P. Hib.* 49 (257 B. C.), *P. Petrie* III 65a (Ptol.).

both troops of bulls	25 *ankalai*	= 10 kg
troop of foals	25 *ankalai*	= 10 kg
troop of camels	15 *ankalai*	= 6 kg

It may be worthwhile to convert into kilogrammes the totals of expenditure that are recorded in our document. Account **I 4** reaches a total of over 10.000 *gomoi*, i.e. c. 200.000 kg (1). Unfortunately enough, this item is difficult to interpret, not only because its connection is very obscure (the account belongs to sheet I, of which we know very little), but also because it has been erased by the author. The total of expenditure recorded in **II 13-19** amounts to 2082 *mouia* = 83.280 kg (2). It contains 1140 *gomoi* = 570 *mouia* = 22.800 kg spent in trade operations (barter), and 1512 *mouia* = 60.480 kg consumed by various troops of animals, mainly during Pharmouthi-Payni of the 8th year.

3. The Components of the Animals' Diet.

The χόρτος which is the subject of our document very probably came from artificial meadows, and must consequently have been composed of cultivated plants (mainly clover) and, to a smaller extent, of gramineous plants (3). The term χόρτος was applied to green forage as well as to dry forage ; in our document it certainly referred to the latter. During part of the year (Choiak-Phamenoth) the animals, kept at To Skelos, have undoubtedly been fed on grass, either on pasture land, or in their stables. If there has been any accountancy about stall-feeding on grass, it must have been separated from the document we possess.

Cato, *De Agri Cultura*, 54.1 gives the following advice in connection with the feeding of oxen : *interdiu pascito, noctu faeni pondo XXV uni*

(1) The *gomos* has been reckoned at 20 kg, cf. supra p. 29.

(2) 1 *mouion* was equivalent to 2 gomoi (cf. e. g. **II 11**, 6). The contents of a *mouion* (measure of capacity) of hay must consequently have weighed 40 kg.

(3) The subject is dealt with by M. Schnebel, *o. c.*, pp. 211-218.

bovi dato. As far as we know, a combination of pasturing (or stall-feeding on grass) and hay feeding would only have been possible at To Skelos during Choiak-Phamenoth, when grazings and meadows were open (cf. p. 25). During these months, however, not a single ration of hay has been issued to whatever troop of animals.

During the initial months of the year (Epeiph-Hathyr) some of the troops have undoubtedly been fed (at least for part of the time) on products which were neither grass nor hay. The question arises whether these products were also provided for animals that were fed on hay i.e. whether they supplemented *χορτικὴ τροφή*. The answer to this question ought probably to be positive. A first indication may be found in **II 15**, which concerns the exchange of 600 *gomoi* of hay against a certain quantity of chaff. As the exchange has very probably taken place during Pharmouthi-Payni, the product in question may have served as a supplement to the hay rations that were issued in the course of that same period. A second indication will be derived from a comparison of our data with rations that are mentioned in other documents (1).

We shall limit our comparison to a small number of documents which are unlikely to leave part of the animal's diet unmentioned and are referring to metrological units whose weight or capacity are known (2).

(1) There exist two doctorate-dissertations on ancient cattle-breeding : F. Vincke, *Die Rinderzucht im alten Italien*, Giessen, 1931 and K. Zeissig, *Die Rinderzucht im alten Griechenland*, Giessen, 1934. Their chapters on *Ernährung* have merely taught us that no ancient literary information on this subject seems to have escaped our attention.

(2) Neither of these conditions is fulfilled in BGU 1508 (late 3rd century B. C.), recording daily hay rations of successively 2 and 2 2/3 *desmai* per head for a troop of asses. *PSI* 543 (mid. 3d cent. B. C.) deals with the feeding of horses in the course of a journey (the first condition is therefore likely to be fulfilled) and records their daily consumption of hay and barley, without mentioning the number of animals concerned. *PCZ* 59689 (257-6 B. C.) concerns the rearing of horses ; their daily ration per head amounted to 3 *desmai* of hay, supplemented by wheat and barley. The weight of the *desmai* in question is unknown (probably not identical with that of the *desmai dimnaioi*). *P. Petrie* II 25 *c* and *e* (226 B. C.) concern the feeding of horses ; their daily ration of hay amounted to 8 *desmai dimnaioi*. As these Petrie

P. Petrie III 61 *g* and *h* (226 B.C.) both concern the same case, namely the keeping of 15 horses and 10 mules during a short period. Each of the horses was fed on 8 *desmai dimnaioi* = 8 kg (1) of hay and 1/5 *artaba* = c. 5 kg of barley a day, each of the mules on 8 *desmai dimnaioi* = 8 kg of hay, and 5 *choinikes* = c. 3 kg of barley a day.

On two occasions (*De Re Rustica*, VI. 3 and XI. 2) Columella explains to the Italian farmer that the diet of oxen ought to be regulated according to the time of the year. We shall limit our quotations to the passages in which there is question of *faenum*. Except for one case (XI. 2. 99) the hay rations he indicates were not to be supplemented by other products.

January

VI. 3. 5 : *si grano abstinemus, frondis aridae corbis pabulatorius modiorum viginti, vel faeni pondo triginta, vel sine modo viridis laurea et ilignea frondes.*

XI. 2. 99 : *mense Ianuario paleas cum ervi macerati sextariis sex, vel paleas cum cicerculae fresae semodio, vel frondis corbem pabulatorium modiorum viginti, vel paleas quantum velint, et faeni pondo viginti, vel affatim viridem frondem ex ilice vel lauro, vel, quod his omnibus praestat, farraginem hordeaceam dabit siccam.*

February

VI. 3. 6 : *mense Februario plerumque eadem sunt cibaria.*

XI. 2. 99 *Februario mense idem.*

papyri belong to the same archive as *P. Petrie* III 61 *g* and *h*, in which the same ration of hay is supplemented by a ration of barley (cf. above), they probably leave part of the horses' rations unmentioned.

(1) As we have reckoned, in our previous conversions, the *ankale* at 400 grammes, the *desme dimnaios*, which weighed 2 1/2 times as much, has to be reckoned at 1 kg. Its theoretical weight was 982 gr., cf. p. 29.

March and first half of April

VI. 3. 6 *Martio et Aprili debet ad faeni pondus adici, qua terra proscinditur; sat autem erit pondo quadragena singulis dari.*

XI. 2. 99 *Martio idem, vel, si opus facturi sunt, faeni pondo quinquaginta. Aprili frondem querneam et populneam ex cal. ad idus vel paleas vel faeni pondo quadraginta.*

November and December

VI. 3. 8 *Novembri mense ac Decembri per sementem quantum appetit bos, tantum praebendum est: plerumque tamen sufficiunt singulis modii glandis et paleae ad satietatem datae, vel lupini macerati modii, vel ervi aqua conspersi sextarii VII permixti paleis, vel singuli modii vinaceorum, si iis, ut supra dixi, large paleae adiciantur; vel si nihil horum est, per se faeni pondo quadraginta.*

XI. 2. 101 This passage does not take into account the possibility of feeding on hay.

According to Columella's calendar no hay would have to be fed from the middle of April onwards until the end of October. During these months oxen were to be kept on green forage (until the middle of June, or even until 1st July in cooler regions) and afterwards (up to 1st November) on leaves, matured by rain or by continual dew (cf. VI. 3. 6-7).

Finally two data, derived from Cato's *De Agri Cultura*, ought to be mentioned. They are again dealing with the keeping of oxen : 54. 1 : *interdiu pascito, noctu faeni pondo XXV* (= 8.38 kg) *uni bovi dato*; 54.3 : *ubi verno dare coeperis, modium* (= 8.75 litres) *glandis aut vinaceorum dato aut modium lupini macerati et faeni P. XV* (= 4.91 kg).

According to our calculations on p. 30, the *βόες* kept at the estate received a daily ration of c. 8 kg of hay. As Columella's calendar recommends rations of hay which varied, as far as they were not to be supplemented by other products, between 9.82 and 16.37 kg, it seems

likely that the rations, recorded by *P. Iand.* 653, have been supplemented by other products. These supplements must have been less nutritive than Columella's « *paleas quantum velint* » (XI.2.99) or Cato's « *modium glandis aut vinaceorum aut modium lupini macerati* » (54.3) for the former were to supplement a hay ration of only 6.54 kg the latter a hay ration of 4.91 kg. They must have made up for the absence of pasturing, for according to Cato, 54.1 a *pastio* by day would have to be supplemented by a hay ration of 8.38 kgr. (almost exactly the ration of *βόες* in *P. Iand.* 653) in the evening.

One of the supplements that were given to the *βόες* of the domain seems to have been the chaff, whose acquisition is mentioned in **II 15.** *P. Oxy.* 1734 (late 2nd or 3rd century A.D.) ll. 4-5 deals with oxen, foals (the reading is uncertain) and calves *οἳ καὶ ἐσθίουσι χορτοπάτητον μικτὸν ἀχύρῳ ἐπὶ τῆς ἄλω* (SCHNEBEL, *o.c.*, p. 218 : « Heu durch Treten gepresst »).

As for the diet of mules, kept at To Skelos, although their hay rations were on the whole more substantial (9.6 kg) than those that are mentioned in the *Petrie Papyri* (8 kg), it seems rather unlikely that their feeding consisted of nothing but hay. The difference between 9.6 and 8 kg of hay does not make up for the 3 kg of barley that were given as part of their daily diet to the mules whose feeding is recorded in *P. Petrie* III 61 *g* and *h*. If the *λόγος σίτου* of the estate at To Skelos were preserved, we probably would hear more about the *τροφή* of mules.

The rations of hay, issued by the estate to the donkey-drivers and the camel-drivers, cannot be compared with data from other documents. They are less likely to have been supplemented with other products, for asses and camels were easy to keep.

The problem we are dealing with in this chapter may be further illustrated by calculating the nutritive value of the rations which are mentioned in our document and comparing our results with the specific needs of the animals concerned. The following calculations are based on data which we owe to the kindness of Professor A. Devuyst, Director of the Zootechnical Institute of the University of Louvain.

To find out whether the hay rations of our document were covering, on their own, the animals' needs, we ought to know three elements : 1. the exact composition of the hay which has been fed ; 2. the intensity of the work done by the animals ; 3. the animals' live weight. Being of mediocre quality, Egyptian hay may have contained, according to Prof. Devuyst, c. 45 gr of protein and c. 310 gr of starch-value per kilogramme. As for the second question, we believe that the animals of the Arsinoite estate were employed rather intensively ; some of them may even have performed heavy work. The third question is difficult to answer, because we ignore to what breed the animals of our document belonged and we know very little about their age (1).

Bulls, oxen and cows require the following daily amounts of protein and starch-value *per 100 kg of live weight* :

1. for mere maintenance	60 gr of digestible protein	600 gr of starch-value
2. for light work	100-110 gr	740-750 gr
3. for medium work	140 gr	960 gr

As the oxen of our document received, in general, 20 *ankalai* = 8 kg of hay a day, their ration contained 360 gr of protein and 2480 gr of starch-value. In the third category of work these amounts would have covered the needs of an ox weighing some 250 kg. Whatever may have been the variety to which the oxen of the estate belonged, they certainly weighed more than 250 kg. The hay rations given to oxen must consequently have been supplemented with other products.

The bulls of the estate were fed on 25 *ankalai* = 10 kg of hay a day, which means that they received some 450 gr of protein and some 3100 gr of starch-value. This would have been sufficient to secure, in the third category of work, the fitness of an animal of some 320 kg. The bulls in question must have been considerably heavier, and they

(1) It is not certain at all that the terms *βονείδιον* (**II 19**,9) and *μουλάριον* (**II 2**,7 ; **II 18**) have kept their diminutive meaning. The *ἱππάρια* of **II 1**,4, and **II 2**, 11, however, are likely to be identical with the *πωλάρια* of **II 14**,3.

consequently must have received supplementary rations of other products.

The daily amounts of protein and starch-value required by horses, mules and asses are the following (again per 100 kg of live weight):

1. for mere maintenance	60 gr of digestible protein	500 gr of starch-value
2. for light work	80 gr	700-740 gr
3. for medium work	100-105 gr	960-1000 gr

The foals of the estate, fed on 25 *ankalai* = 10 kg of hay a day, received 450 gr of protein and 3100 gr of starch-value. The amount of starch-value would have been sufficient to secure, in the third category of work, the efficiency of a 320 kg animal. As opposed to the previous cases, it is not unlikely at all that a foal should have weighed 320 kg; in this case we consequently are not forced to assume that the animals' hay rations have been supplemented with other products.

The mules of our document would probably have been insufficiently fed if they had only received 24 or 20 *ankalai* = 9.6 or 8 kg of hay. The higher ration contained 432 gr of protein and 2976 gr of starch-value. The latter amount would have covered the needs (in the third category of labour) of an animal weighing some 300 kg, which is a rather low weight.

As for the asses of the estate, even those that were fed on 12 *ankalai* = 4.8 kg a day (others received 15 *ankalai* = 6 kg.) did not need any supplementary products. 4.8 kg of hay contained some 216 gr of protein and some 1488 gr of starch-value. The amount of starch-value would have been sufficient to keep a 150 kg ass fit for work of the third category; this is a likely body-weight for an animal whose carrying power amounted, according to our document, to ca. 80 kg (cf. p. 29). The animals that were fed on 6 kg a day were probably employed in *heavy* work.

The information we obtained from Prof. Devuyst consequently confirms the conclusions we drew after comparing our document with details derived from other Greek papyri and from Latin authors.

CHAPTER IV

THE ACCOUNTANCY

The author's information seems to have been derived from accounts that were delivered to him by various people, employed at the domain of To Skelos, or belonging to the staff of related domains (1).

Owing to the almost complete loss of sheet I and to the very fragmentary state of sheet II, the general thread of the author's accountancy is far from easy to follow. The situation is further complicated not only by the author's anticipation of year 9 (cf. p. 11) but also by the presence on sheet II of a number of accounts which are not at their normal place. This is obviously the case with **II 24**, which should have appeared in section 8, verso ; in our opinion it also applies to **II 5** and **6**, **II 16** and **II 19**, 2-4, which are all concerned with the maintenance of *βόες* during the initial months of the 8th year, and ought normally to have been listed among the accounts of sheet I. In all these cases the author seems to repair earlier omissions.

Although our author seems to have proceeded too rashly to avoid omissions and mistakes, he can hardly be accused of negligence, for most of his errors have been repaired. Apart from the examples quoted above, we might refer to **I 4**, **II 1**, 5, 6, 12, **II 6**, 2, **II 13**, 1, **II 16**, 1, **II 18**, 6 (correction of mistakes), **II 9**, 3 and **II 10**, 7 (retrieval of omissions), **II 14**, 1 (faulty retrieval of an omission, afterwards corrected). There are only two mistakes that have been overlooked by our author : in **II 16** there ought not to be question of 23rd and 25th Phaophi, but of 24th and 26th Phaophi.

(1) Cf. **I 2** : *λόγος Παπνουθίου* ; **II 2** : *λόγος χόρτου Φίβιος* ; **II 7** : *λόγος Ἰσακίου σταυλίτου* ; **II 8** : *λόγος χόρτου Πακενίου*.

The author's carefulness is also proved by the following facts. He seldom simplifies the sums he obtains after having multiplied an amount of daily consumption with a number of days. This has only been the case in **II 13**, 2 (57 *gomoi* instead of 57 gomoi 30 *ankalai*) and in **II 16**, 7 (946 *gomoi* instead of 946 *gomoi* 40 *ankalai*). In some cases the accounts he consulted do not seem to have contained all the details he needed. He then leaves the necessary space for a later addition. This has been the case in **II 18**, 7, where the addition took place (1), and in **II 22**, 3, where it did not.

The author's accountancy might be called a peculiar mixture of different intentions : in some respects he merely wants to give a *statement*, whilst, in other cases, he intends either to *explain* or to *check*. — As a whole his λόγος χόρτου is a mere statement, for its does apparently not intend to explain a general surplus or a general deficit of χόρτος by comparing the total of receipts with the total of expenditure. — The same is true of the entries of **I 1**, **I 2**, **II 1**, **II 5**, **II 11**, for none of these accounts of receipts of the 8th year ends with a total of deliveries whose composition would have been explained by the body of the account ; there is, however, no question of uniformity, since **II 2** indicates at the end a sum total of provisions delivered by Phib (2). As opposed to the accountancy of receipts of the 8th year, the lists of receipts of the 9th year usually end with a total, cf. **II 10**, 7, **II 13**, 4, **II 14**, 6, **II 17**, 2, **II 18**, 5, **II 20**, 22, and probably also **II 9** and **II 22**, 8. — In **II 20**, 9 and 12, the reference to the number of ζῷα by whom the transport had been effected has an explanatory function ; as most of the provisions have been conveyed by donkeys, one does not see why these details should be given here, and not elsewhere. — In the accounts of consumption the author's reference to the number of animals, the daily ration per head and the number of days during which the animals were fed on hay, clearly intends to explain the total of consumption during the period concerned. On

(1) The writing cf. l. 7 is more sloping than that of the preceding lines, and the ink is different, cf. Plate IV.

(2) **II** 7 gives a partial total in l. 4.

the contrary, as far as the anticipation of the 9th year (cf. p. 11) is concerned, these same accounts give too little explanation. Here we ought to know at least the total of consumption, the total of deliveries, and the difference between both sums. In actual fact the author does not indicate the total of consumption (cf. **II 10**, 5-7, **II 14**, 5-7, **II 18**, 4-5) except in one case, where it is at least calculable (**II 19**, 7) ; in **II 13**, 4, **II 17**, 2, **II 21**, 14-7 and **II 22**, 2-8, he neither indicates the total of consumption nor the difference between this total and the total of deliveries. — Some of the accounts of consumption give a total of receipts of the 8th year (cf. **II 10**, 2, **II 14**, 5, **II 21**, 10). If these references were more frequent, one would be entitled to believe that the details of the accounts of receipts have been given in order to check the correctness of the former. Although there has indeed been some checking (cf. **II 2**), it does not seem to have influenced the general structure of the account.

We may safely conclude from all this that the author of our document started upon his work without a clearly defined design. Together with the omissions of which we spoke at the beginning of this chapter, and with the change of procedure, dealt with on pp. 52-3, the author's confused intentions show that he has been overwhelmed by the imposing number of *πιττάκια* he had to take into account (1).

(1) This number must have been considerably higher than the number of *λόγοι* contained in our document. Most of these *λόγοι* resulted from a combination of two or more *πιττάκια*.

CHAPTER V

THE TEXT

FIRST SHEET (FRAGMENTS *F-I*)

As we ignore the sequence of the accounts belonging to this sheet, we shall publish the fragments in their alphabetical order.

RECTO

Fragment F ; belongs to the lower half of the sheet ; 5 × 14,5 cm.

I 1

[τρ]οφ(ὴ) Σκελαί(ων) ζ(ώων) . .
[ἀγ]οραστ(οῦ) χόρτ(ου) η ἰνδ(ικτίονος)
[. .]. ακ( ) Μηνᾶ γ(όμοι) ξη
[τ]ροφ(ὴ) ὀνηλατ(ῶν) γ(όμοι) δ
λ(οιπὸν) γ(όμοι) ξδ
[χ]όρτ(ου) ζ ἰνδ(ικτίονος) γ(όμοι) μ
[ἀπὸ] Κὲκ ἀπὸ ἀγορᾶς
γόμ(οι) ζ (καὶ) ἀποστ( ) γόμ(οι) . .
(καὶ) ἀπὸ γεου(χικ. .) γρα( ) Πακ(ενίου)
γ(όμοι) ξδ.
Παῦν(ι) κς ἀγοραστ(οῦ)
[ἀπὸ] Μούχ(εως) γ(όμοι) λς

1. The end of the line is not certain ; perhaps ζ . . ( ) ought to be read.
3. πιττακ( ) is very unlikely. the word is always written ἀπ̊.
7. ἀπὸ : except for one case (**II 9**, 6)
10. after ξδ a curved vertical line, symbol for 1/2 ?

The account is practically complete.

The account deals with deliveries and purchases of hay which took place at the end of year 7 (cf. l. 10 : *Παῦνι κς*) and at the beginning of year 8. The provisions in question would be consumed ; if our reading of l. 1 is correct, their exact destination has not been indicated. Menas also appears in **II 1**, **II 5**, **II 9**, **II 11** and **II 21** ; he seems to have belonged to the donkey-drivers of the estate. Pakenios will be mentioned again in **II 8** and **II 20** ; he was either a donkey-driver or a muleteer of the domain. Out of the 68 *gomoi* delivered by Menas, 4 *gomoi* were allowed to the donkey-drivers who had been in charge of the transport. Part of the provisions that are recorded in this account (the 40 *gomoi* of l. 6, and undoubtedly also the 36 *gomoi* of l. 12) belonged to the harvest of the 7th year.

Fragment G ; belongs to the upper half of the sheet ; 7,5 × 15 cm.

I 2 1 λό(γος) Παπνουθ(ίου) (ὑπὲρ) γραμμ(ατικοῦ) γ(όμ.) σ
[*M*]εσορ(ὴ) θ γ(όμ.) κδ
[Με]σορ(ὴ) ς τροφ(ὴ) ὀνηλατ(ῶν) γ(όμ.) κδ
['Επ]ὶφ κε τῶ(ν) αὐτ(ῶν) γ(όμ.) κ
5 ['Επ]ὶφ κδ καμ(ήλων) γ(όμ.) κδ
['Επὶφ] ιε̣ [ὀ]νηλ̣[α]τ̣(ῶν) γ̣(όμ.) κ̣δ
[καμ(ήλων) γ(όμ.)] κ̣δ
[Με]σορ(ὴ) κθ ὀ̣νηλ̣[α]τ̣(ῶν) γ̣(όμ.) λβ
[Μεσο]ρ̣(ὴ) α γόμ(οι) ξ

7. At the beginning of the line either *'Επὶφ . .* or *Μεσορ(ὴ) λ* ought to be restored. The entry probably dealt with the keeping of camels. If it were concerned with provisions delivered to donkey-drivers, l. 8 would have read *τῶν αὐτῶν*.

The account is practically complete.

I 2, which belongs to the least complicated accounts of the entire document is, at the same time, extremely misleading, for anybody who is unaware of the author's anticipation of year 9 will almost necessarily try to establish a connection between ll. 3, 4, 6, 8 and the deliveries recorded in **II 9**, an account which deals with *τροφὴ ὀνηλατῶν* :

I 2, 3 : 6th Mesore	**II 9**, 11 : 6th Mesore,	delivery from Bousiris
I 2, 4 : 25th Epeiph	**II 9**, 9 : 25th Epeiph,	idem.
I 2, 8 : 29th Mesore	**II 9**, 15 : 29th Mesore,	idem.

These concordances are purely fortuitous, for **I 2**, 6 has no counterpart in **II 9**, and the deliveries from Bousiris, recorded in **II 9**, 8 (11th Epeiph), 10 (1st Mesore), 13 (21st Mesore) are not referred to in **I 2**. The account **II 9**, 6-23 deals with deliveries of the 9th year, whereas **I 2** records deliveries which took place at the beginning of the 8th year.

Two entries (ll. 2 and 9) do not tell us for what reason the *gomoi* in question had been delivered. These provisions would probably be exchanged against other agricultural products, cf. similar entries in **II 2** and cf. also **II 15**. The motivation of the delivery recorded in l. 1 is not clear. The term usually refers to a fee paid to scribes or to a tax.

Fragment H ; its position is uncertain ; 3,8 × 3,8 cm.

I 3

ἀ]πὸ *Μαντ*( ) *κ*
ἀπὸ *Μ*]*αντ*( ) *ι*
ἀπὸ *Μ*]*ανt*( ) *ι*

The amounts undoubtedly refer to *gomoi*. The account is only complete on its right side.

Μαντ( ) is likely to have been the name of a village, rather than of a person. The deliveries recorded in this column probably took place at the beginning of year 8.

Fragment I ; belongs to the bottom of the sheet ; 6,5 × 7,5 cm.

I 4

⟦ — — — — — — — — ⟧
⟦+ ἐξ ἀναλωμάτ(ων)⟧
⟦γόμ(οι) ω̣.ϱ̣[.] ⟧
⟦..... γ(όμ.) — — — — — ⟧

The beginning is missing. The entire account has been erased by its author.

I 4 has been dealt with on p. 31.

VERSO

Fragment I

I 5 Only the end of two lines has been preserved :

]ωμ
]. α

Fragment H

The verso contains no traces of writing.

Fragment G

I 6
1 [τροφ(ὴ) ..]ψ( ) ταύρ(ων) τῶ(ν) ἀπὸ Φαρμο[ῦθ(ι) — —
[ἀπὸ Ἐπὶ]φ ζ ἕως Θὼθ κ [— —
[...] (καὶ) ἀ[πὸ] Παῦνι ιε ἕως Φ[αῶφ(ι) ιζ — —
[....] α — — — — — — — [— —
5 [.....]..[— —
ἀπὸ .....[— —
ἀπὸ Μούχ(εως) γ(όμ.) η ἀπὸ τ(οῦ) Σκέλους μ[— —
ἀπὸ Ταλὶ ἕως Φαῶφ(ι) ιζ γόμ(οι) . [— —
λ(οιπὸν) ἔχει γόμ(ους) μ. .[— —
10 ἐξ( ) .....[— —
ἀπὸ .....[— —
ἀπὸ Ταλὶ ..[— —
— — — — — [— —

The account has been very badly preserved. Its right half and its end are missing. From l. 6 onwards, we possess the beginning of the lines ; the initial letters of ll. 1-5, which seem to have been projecting to the left, have not been preserved. 1. not [τρο]φ(ὴ) ταύρ(ων), for the first letter that has been preserved is clearly a ψ. ταύρ(ων) seems to have been preceded by the abbreviation of a term which was used to specify the troop in question ; there were indeed two troops of bulls. 2. [ταύ]ρ(ων) ζ is less likely. 3. Φαῶφ(ι) ιζ has been restored in accordance with l. 8. 10. the abbreviation ἐξ( ) will appear again in **II 2**, 17, **II 6**, 6, **II 12**, 2 ; it is always used in connection with provisioning.

I 6 very probably concerns the first troop of bulls, whose maintenance during Pharmouthi-Payni of the 8th year will be dealt with on the second sheet, **II 21**. The course of **I 6** seems to be as follows : remaining provisions after Pharmouthi-Payni of the *7th year* — deliveries on account of the initial months of the 8th year, consisting of a. provisions obtained from a single village between 7th Epeiph and 20th Thoth, b. provisions obtained from various villages between 15th Payni (7th year) and 17th Phaophi — total of expenses during the initial months of year 8 (lost in l. 8) — surplus — deliveries of hay which would be consumed during Pharmouthi-Payni of the 8th year.

The last item of **I 6** is important, for its presence in **I 6** probably explains why **II 21**, as opposed to the other accounts of sheet II, is not preceded by any related account of receipts. **II 21**, 8-10 : *ἔχουσι δὲ ἕως τῆς αὐτῆς* very probably summarizes the receipts that had been listed in **I 6**, 10-13 and the following lines, which are lost.

Although we know very little about the accountancy on sheet I, the formulation of **I 6** is likely to have been rather exceptional. 1. As a rule, the accounts of expenditure of sheet I cannot have recorded the provisions received for the maintenance of animals during the initial months of the year, for otherwise **I 1**, **I 2** and similar accounts would have been useless. 2. The accounts of expenditure of sheet I did not usually contain a survey of provisions that had been received on account of *χορτικὴ τροφή* during the final months of the year ; the delivery of provisions that would be consumed during Pharmouthi-Payni would normally be recorded on sheet II, in connection with the accounts of expenditure during that same period.

It ought to be noticed that the provisioning for the initial months of the 8th year started on 15th Payni of the 7th year (cf. l. 3). Similarly the deliveries on account of year 9 seem to have taken place from 15th Payni of the 8th year onwards, cf. **II 21**, 14.

Fragment F

Faint traces of writing.

SECOND SHEET (FRAGMENTS *A-E*)

RECTO

Section 1

Fragment E ; constitutes the upper half of the section : 9,3 × 14,6 cm. Cf. Plate I (1).

II 1 1 † *Πετόος Μαειουρᾶ*
Φαμενὼθ τροφ(ὴ) (ὑπο)ζ(υγίων) ζ(ώων) ἡμ(ετέρων)
γόμ(οι) [—]
(καὶ) δι(ὰ) τῶ(ν) ὀνηλατ(ῶν) *γόμ(οι)* [—]
τροφ(ὴ) ἱππαρ(ίων) *γ(όμ.) λ* [.]
5 ⟦*Ἐπὶφ κ ταύρ(ων) (ὑπὲρ) Μηνᾶ* [*γ(όμ.)* —] ⟧
⟦*Μεσορὴ λ τροφ(ὴ) ὀνηλατ(ῶν)* [*γ(όμ.)* —] ⟧
Χοίακ τροφ(ὴ) (ὑπο)ζ(υγίων) ζ(ώων) ἡμ(ετέρων)
[*γ(όμ.)* —]
. τροφ(ὴ) (ὑπο)ζ(υγίων) ζ(ώων) ἡμ(ετέρων) [*γ(όμ.)* —]
Ἀάνις [*γ(όμ.)* —]
10 *(καὶ) (ὑπὲρ) υἱοῦ λ.ρ γόμ(οι) ε*
Ἐπὶφ ιη Ἰουλιανὸς .. [*γ(όμ.)* —]
⟦*κ τροφ(ὴ) ταύρ(ων) (ὑπὲρ) Μη*[*νᾶ* *γ(όμ.)* —] ⟧
(καὶ) ..θ( ) ἀπ(ο)σ( ) πι...( ) Ἰουλιανός *λ*
Ἀμόθες *ις*
15 *(καὶ) (ὑπὲρ) Ἰσακίου* *κζ*
(καὶ) α ἰνδ(ικτίονος) .....[— —]
— — — — — — — — — — — — — — — — —

The end of the account is lost. 2. The abbreviation consists of two connected ζ, cf. Plates I and III.

(1) A small fragment, situated at the upper edge of E, has been misplaced (and also turned the wrong way round). It belongs to the upper edge of A.

1. Sheet A-E has no general heading. This is a further proof that it has been preceded by sheet F-I. The name *Μαιεουρᾶς* seems to be derived from *Μαϊῶρ-όρος*: cf. *Μαϊουράνως* and *Μαιεῦρις* in PREISIGKE's *Namenbuch*. Cf. also *Μαιεῦραξ*, *O. Tait Bodl.* II, 610.

2. The term *ὑποζύγια ζῷα* also appears in *P. Cairo Masp.* 67279 (c. 570). The troop of asses referred to by *ἡμέτερα* is likely to have been the second troop, whose maintenance during Pharmouthi-Payni is dealt with in **II 14**. In **II 2**, 10, which probably refers to the same animals, they are called *γεουχικά*. The provisions, mentioned in ll. 2, 3, 7, 8 (the indication of their amounts has been lost), must have covered the expenditure of 96 *gomoi*, recorded in **II 14**, 3.

3. *διὰ τῶν ὀνηλατῶν*: to be compared with **II 2**, 10. In our document the term *ὀνηλάται* seems to refer exclusively to the donkey-drivers of the first troop. The hay they transported would not be consumed by their own animals (1) but would be delivered to the donkey-drivers of the 2nd troop. The provisions recorded in ll. 2, 7 and 8 seem to have been conveyed by the recipients themselves.

4. The term *ἱππάριον* seems to have kept its diminutive meaning, for the *ἱππάρια* in question are likely to be identical with the *πωλάρια* whose feeding during Pharmouthi-Payni has been recorded in **II 14**. According to **II 14**, 4 their consumption of hay amounted to 129 *gomoi*. The expenditure was covered by c. 30 *gomoi* obtained from Petôs and 108 *gomoi* obtained from Phib (cf. **II 2**, 11).

5. This entry probably concerns a delivery which had taken place at the beginning of the 8th year, and had been taken into account already (2). Menas, a donkey-driver of the first team, had been in charge of the transport.

6. Again a delivery which had been taken into account already.

9. The name does not appear in PREISIGKE's *Namenbuch*. It may be identical with *Ἀάνιος* (3). Aanis very probably belonged to the stablemen of the estate. He does not reappear elsewhere.

(1) In that case the entry would be formulated: *τροφὴ ὀνηλατῶν*.
(2) It probably has been mentioned in **I 6**, 3-8.
(3) Mentioned in *BGU* 303 (6th century) and elsewhere.

11. Again a delivery which had taken place at the beginning of the 8th year. This time however it had not been taken into account on sheet I, for the entry is not erased. As far as sheet II is concerned, accounts of expenditure during the initial months of the year (**II 6**, **II 16**, **II 19**, 2-4) always deal with the maintenance of *βόες*. Ioulianos is therefore likely to have been *βοηλάτης* (1).

12. Identical with l. 5, and again erased.

13. Only the name Ioulianos can be read with certainty. If our interpretation of l. 11 is correct, l. 13 must concern again the maintenance of *βόες*.

14. The name does not appear in Preisigke's *Namenbuch* ; *P. Flor.* I 78, 4 (5th-6th century) has *Ἀμοῦθις*, *Stud. Pal.* X 153, 12 *Ἀμούτης*.

15. Isakios will be mentioned again in **II 7**, 1 (where he is called *σταυλίτης*) and in **II 9**, 14.

16. The meaning of this entry is very obscure. As our document is dealing with receipts and expenses of the 8th year, a delivery « on behalf of the 1st year » is rather unexpected.

The first account of sheet II may have continued up to the bottom of section 1. It is, however, more likely that the lower half of section 1 has been covered with a second account, of the same type as **II 1** (account of receipts of the first class, cf. p. 10).

Section 2

This section has entirely disappeared. It probably contained further accounts of receipts of the first class.

(1) **II 1** is an account of receipts of the first class ; its total has consequently been included in the 2167 *mouia* of **II 12**. Joulianos must therefore have been in charge of a troop of oxen whose maintenance is dealt with in **II 13-20**, i. e. the 2nd, 3rd or 4th troop.

Section 3

Fragment B : upper half of the fragment : 5 × 15,8 cm. ; lower half (1) : 5,6 × 12 cm. As a complete section would have measured 8 × 29 cm., a substantial part of section 2 has been preserved. A few lines of the writing (**II 2**, 6, 8, 9, 11) were projecting to the right and are (partly) preserved in section 4 (fragment C).

II 2 1 † λό(γος) χόρτ(ου) Φίβ(ιος) η ἰνδ(ικτίονος)
• Φαρμοῦθ(ι) ιε γ(όμ.) .[.]
κ• γ(όμ.) π[.]
κα• γ(όμ.) π
5 ταύρ(ων)• γ(όμ.) ξς
τῶ(ν) αὐτ(ῶν)• γ(όμ.) σκβ .[..... γόμ(οι) ϰ ἀγκ( ) ξς
μουλ(αρίων) ς• γ(όμ.) σιβ
Φαναμ(ϊεῖ)• γ(όμ.) ρμη [.....]ειορ.ζ( ) γό-
μ(οι) ϰ ἀγκ( ) ξζ
..μ( ) Φαναμ(ϊεῖ)• γ(όμ.) ρη [.....].
10 • δι(ὰ) τῶ(ν) (ὑπο)ζ(υγίων) ζ(ῴων) γεουχ(ικῶν) γ(όμ.) ο.
• ἱππαρ(ίων) γ(όμ.) ρη [.....]ειορ.αζ( ) γόμ(οι)
ϰ ἀγκ( ) ξζ
κς• γ(όμ.) σιβ
Βίκτορ(ι) γ(όμ.) ρϙς
(καὶ) δμ(οίως) γ(όμ.) τ μ(ούεια) [ρν]
15 (δμοῦ) γόμ(οι) ἀϡπη [μ(ούεια) ϡϙδ]
(καὶ) ..( ) .( ) β γ(όμ.) ρ (δμοῦ) ἀμ[δ]
ἐξ( ) ἀποστολ(αὶ) νδ

9. δμ(οίως) is not convincing from the paleographical point of view.
11. The reading of the end of this line on Plate III will be complicated by the fact that the upper half of fragment C should be moved a few mm. to the right.

(1) The lower half of the fragment has not been put in its exact position ; it should be moved 0.5 cm. to the right.

1. Phib also appears in **II 20**, **II 21** (where is called a *γεωργός*) and **II 22**. His deliveries amounted to 1044 *mouia* (l. 16). They are part of the c. 1670 *mouia* which, according to **II 12**, 1 were obtained from To Skelos.

2-4, cf. **I 2**, 2 and 9, discussed on p. 43.

5-6. These deliveries are likely to have been made for the maintenance of the second troop of bulls, whose feeding during Pharmouthi-Payni is dealt with in **II 17**. Their consumption during these months amounted to 294 *gomoi* ; the total of Phib's deliveries was 288 *gomoi*. The end of l. 6 has to be read : *γόμοι εἰκοσάγκαλοι ξς* ; the meaning of these 20 *ankalai gomoi* has been discussed on p. 29. The connection between Phib's deliveries for the maintenance of bulls and the 66 *gomoi* mentioned at the end of l. 6 is not clear, because we are unable to read in ll. 8 and 11 the term which was used to introduce a delivery of 67 *γόμοι κ άγκαλοι*. These « additional deliveries » apparently have not been included in the total of l. 15.

7. If our reading is correct, the provisions in question have been delivered for the maintenance of 6 mules. They must be identical with the reinforcement added to the first troop of mules from at least 1st Pharmouthi onwards, cf. **II 18**. Their consumption during Pharmouthi-Payni amounted to 6 × 20 × 90 *ankalai* = 216 *gomoi*. Phib's contribution consisted of 212 *gomoi*.

8-10. According to Preisigke's *Namenbuch*, *Φαναμῖεῦς* is an alternative spelling of *Πανεμῖεῦς*. Phanamieus will appear again in **II 20**, an account which is connected with **II 19**. He seems to have kept the fourth team of *βόες*. Phib's deliveries to Phanamieus amounted to c. 326 *gomoi* ; the provisions of the first two entries seem to have been transported by Phanamieus himself, those of the third entry by the drivers of the 2nd troop of asses (*ὑποζύγια ζῷα γεουχικά*) ; we have found something similar in **II 1**, cf. our commentary on l. 3. Expenditure for the 4th troop of *βόες* during Pharmouthi-Payni amounted, according to **II 19**, 6, to 321 *gomoi*. The significance of the 67 *gomoi*, mentioned at the end of l. 8 is not clear ; cf. our commentary on ll. 5-6.

11. Cf. our commentary on **II 1**, 4.

12. Probably a delivery that was made for the same purpose as those that were recorded in ll. 2-4.

13-14. These are the only entries which have not been checked off by the author. In spite of this, they are likely to be related with some account of expenditures, belonging to the series **II 13 - 19.**

16. The 100 *gomoi* have been tacitly converted into 50 *mouia* and added to the total of 994 *mouia* of l. 15. There may be question of two carts, containing 50 gomoi (i.e. 12 ½ donkey-loads) each.

17. *ἐξ*( ) : cf. **I 6**, 10. *νδ* may be the number of expeditions required by the transport of 1988 *gomoi*. The provisions carried by the *ὑποζ - για ζῷα γεουχικά* (l. 10) for example cannot have been transported in the course of a single expedition for, at the time of their conveyance, only three *ζῷα γεουχικά* were kept at the estate of To Skelos (cf. **II 14**, 1), and the bearing power of a donkey did not exceed 4 *gomoi* (cf. p. 28).

II 3 *ἐπρά̣θ(ησαν) ταῦρ(οι) [. — — —*
κδ ... ἀγορ(αστ..) . (καὶ) μικ( ) [— —

1. after *ταῦρ(οι)* [ ] the name of another kind of animals is missing.
2. *μικ( )* : *ἰδικ( )* could also be read. This short note has been dealt with on p. 22.

II 4 *ε̣ρ̣ι̣τ̣α̣ρίου σφ(υρίδες) ξ ρκ*

σειταρίου cannot be read.

This note deals, in our opinion, with another instance of barter. In **II 15** 600 + 540 *gomoi* of hay were exchanged against a certain quantity of chaff and two *kouria* of a product which has not been specified. **II 4**, on the contrary, seems to record the exchange of 60 *sphyrides* of a certain product (we are unable to read its name) against 120 *gomoi* of hay. We do not know if these 120 *gomoi* have been included in the total of receipts which is mentioned in **II 12**, 1.

II 5 *τροφ(ὴ) βοῶν Σκε[λαί(ων)]*
Ἀβραὰμ γ(όμ.) δ
Σερῆνος γ(όμ.) δ
Μηνᾶς [γ(όμ.) δ]
Ἠλίας [γ(όμ.) δ]

2. Abraam is also mentioned in **II 9**, 16 and 23, **II 11**, 2.
3. Serenos will appear again in **II 11**, 3.
4. Menas : cf. our commentary on **I 1**.
5. Helias will be mentioned again in **II 6**, 5, **II 7**, 4-5 (here he is called *υἱὸς Ἀσίνου*), **II 8**, 5 (*Ἠλίας Ἀσίνου*) and **II 20**, 10.

This is an account of receipts belonging to the 2nd class (cf. p. 10). The four persons in question were donkey-drivers ; each of them seems to have made a single expedition with a single animal (cf. bearing power of asses). These small provisions were probably delivered to the *βόες* of the first team and would be consumed during the initial months of the year. They were completed by further deliveries which are mentioned in **II 6**, 4-6. The maintenance of the 1st troop of *βόες* during Pharmouthi-Payni seems to have been secured by deliveries recorded in **II 11**, an account which is closely resembling the present account. The first troop of *βόες* seems to have been distinguished from the other troops by the specification *Σκελαῖος* ; it may have the same value as *ἡμέτερος* in **II 1**, 2, 7 and 8, and *γεουχικός* in **II 2**, 10.

II 6 1 *Θὼθ ζ ελθ( ) εἷς βο[ῶ(ν) Σκελαί(ων)]*
τροφ(ὴν) γόμ(οι) ζ ἀγκ(άλαι) [[λ]] ι λ(οιπὸν) γ(όμ.)[η ἀγκ(άλαι) μ]
(καὶ) ἀπὸ ... ελθ( ) ε[— —
Φαῶφ(ι) ιδ δ[— —
5 *κγ Ἠλ[ίας — —*
κε ἐξ( ) [— —

As the previous account (**II 5**) reaches the lower limit of the author's writing area, there is no doubt that the present account is a later addition. It seems as if the author originally intended to give first a complete survey of receipts (both classes, one after another) and af-

terwards a survey of expenditure. After **II 7** and **II 8** (which, like **II 5**, belong to the second class of accounts of receipts), he changed his mind and gave immediately the related account of expenditure (**II 9**). He went on in a similar way until **II 11** and its related account (lost in section 8, recto). He then calculated the total of receipts of the first class (**II 12**) and gave, in **II 13-19**, a survey of the expenditure they had covered. On re-reading his text ne noticed : 1. that he had not given a complete list of the provisions that had been delivered for the maintenance of *βόες Σκελαῖοι* during the first months of the year ; 2. that the consumption of these provisions had nowhere been recorded. His double omission was repaired in **II 6**, which probably went on in the lower margin of section 4, with a survey of consumption during Phaophi and possibly also Hathyr.

As 7 *gomoi* 10 *ankalai* are the total consumption of a single day (7th Thoth) the troop in question must have contained 18 animals (1). The author originally calculated the consumption of 19 animals and consequently obtained a total of 7 *gomoi* 30 *ankalai*.

During Thoth the *χορτικὴ τροφή* of the first troop of *βόες* appears to have been limited to a couple of days. The problem of the animals' maintenance during the initial months of the year has been discussed on pp. 25-6.

Section 4

Fragment C : contains an important part of the upper half of the section, and a small part of the lower half ; 7 × 18,5 cm. ; cf. Plate III. Some of the lines that appear in section 4 are a continuation of the writing in section 3 (cf. **II 2**, 6, 8, 9, 11).

II 7 1 [†] *λ*[*ό*](*γος*) *Ἰσακί*(*ου*) *σταυλίτ*(*ου*)
[*ἀπο*]*στο*( ) *γόμ*(*οι*) *καθ*( ) *μ*
[(*καὶ*)] (*ὑπὲρ*) *η ἰνδ*(*ικτίονος*) *γόμ*(*οι*) *ρκζ*
[*ζ*(*ῴοις*) *παρ*]*ὰ τοῦ* [*υἱ*]*οῦ Ἀσίνου γ*(*όμ.*) *β* (*δμοῦ*) *ρκ*[*θ*]

(1) The usual daily ration of *βόες* amounted to 20 *ank.* per head.

After avoiding the end of **II 2**, 6, 8, 9, 11, the author continues :

5 *ζ(ώοις) παρὰ τοῦ υἱοῦ Ἀσίνου*
καθ( ) γόμ(οι) λβ

Isakios' account belongs to the second class of accounts of receipts, and records part of the provisions that were delivered for the maintenance of the troop which is dealt with in **II 9**. The same is true of **II 8**.

1. *στὰυλίτου* : cf. **II 9**, 12 and **II 10**, 2. The usual spelling is *σταβλίτης*. In our document the term does not refer to officials in the posting service, but simply means « stablemen ». This is also the case in *P. Oxy.* 146 (555), recording the payment of a *mouion* to Serenos, *σταβλίτης τοῦ βαδιστικοῦ στάβλου*, for carrying hay and chaff from the barn belonging to the *γεοῦχος* (landlord) to the stable of the monastery of Andreas. The term is used by our author in connection with muleteers (cf. **II 10**, 2) and donkey-drivers (cf. **II 9**, 12) ; it has not been applied to the other stablemen of the estate.

2 & 7. *καθ( ) γόμοι* do not appear elsewhere in our document. The term probably refers to the usual 50 *ankalai* loads, and seems to have been used in order to distinguish these from the *γόμοι εἰκοσάγκαλοι* mentioned in **II 2**, 6, 8 and 11. *Καθ(αρός)* is not convincing.

4. The *υἱὸς Ἀσίνου* is Elias, cf. **II 8**, 5.

II 8 1 [*λό(γος) χ*]*ὸρτ(ου) Παχ(ενίου) η ἰνδ(ικτίονος)*
[. . .].[. .]. *Φοιβ*[*άμμ(ωνι) γ(όμ.) . .*]
[*ἀ*]*ποστ( ) α. . . . γ(όμ.)* [. .]
[.]. . *εἰς τὰ ἐωνημ(ένα) γ(όμ.)* [. .]
5 [.]. *Ἡλίᾳ Ἀσίνου γ(όμ.) λ*[.]
[. .].[— — — — — — — — —]

The account probably did not continue much further than l. 6 ; cf. our commentary on **II 6**.

II 7 and **II 8** very probably explain the origin of the 331 *gomoi* 10 *ankalai* that were consumed by the *ὑποζύγια ζῷα ὀνηλατῶν* during Pharmouthi-Payni, cf. **II 9**. Both Elias (recipient in **II 7**, 4-5 and

II 8, 5) and Phoibammon (recipient in **II 8**, 2) were donkey-drivers. If our reading of l. 4 is correct, *τὰ ἐωνημένα* must refer to the animals that were bought on 1st Payni (cf. **II 9**, 4). Cf. **II 2**, 7 which also concerns a delivery for the maintenance of animals that had been added to a certain troop.

Section 5

Fragment D : preserves an important part of the upper half of the section (7,5 × 14,5 cm.) and a small part of the lower half (4,5 × 4,3 cm.) (1). Cf. Plate III.

II 9 1 † τ̣[ρ]οφ(ὴ) ὀνηλατ(ῶν) η ἰνδ(ικτίονος)
τροφ(ὴ) (ὑπο)ζ(υγίων) ζ(ώων) ιδ ἀπὸ ἀγκ/ ιβ τῶ(ν) ἀ̣[πὸ Φαρμοῦθ(ι) α]
ἕως λ 'Παχὼν' ἡμερ(ῶν) ξ ⟦γί(ν.)⟧ ἡμερ(ουσίως) γόμ/ γ [ἀγκ/ ιη γί(ν.) γ(όμ.) σα ἀγκ/ λ]
(καὶ) ἀπὸ Παῦνι α ἠγοράσθ(ησαν) ζ(ῶα) δ̣ [γί(ν.) ἡμερ(ουσίως) γ(όμ.) δ ἀγκ/ ις]
5 γί(νεται) γόμ/ ρκθ ἀγκ/ λ ἔχ[ουσι ἀπὸ μη(νὸς) Ἐπίφ]
ἀπὸ το(ῦ) Σκέλους [— — —
Ἐπὶφ η ἀπὸ Μούχ(εως) [— — —
ια ἀπὸ Βουσήρ(εως) [— — —
κε ἀπὸ Βουσήρ(εως) [— — —
10 Μεσορ(ὴ) α ἀπὸ Βουσήρ(εως) [— — —
ς ἀπὸ Βουσήρ(εως) [— — —
ιδ ἔχει Φοιβάμμ(ων) σταυλίτ(ης) ἀπὸ Μούχ̣(εως) [— — —
κα ἀπὸ Βουσήρ(εως) [— — —
κς τροφ(ὴ) Μηνᾶ ἀπ̣α( ) Ἰσακίου . [— — —
15 κθ ἀπὸ Βουσήρ(εως) [— — —
λ ἀπὸ Μούχ(εως) ζ(ώοις) Ἀβραὰμ [— — —

(1) The fragment of the lower half has not been restored in its exact position. It ought not to touch the upper half (a distance of ca. 0.5 cm. seems likely) and should be moved 1.2 cm. to the left.

..... χ[όρ]τ(ου) ζ ἰνδ(ικτίονος) [— — —
[.] Μ[ηνᾶ] χορτα( ) [— — —
[ἀ]πὸ τοῦ Μελίτ(ωνος) [— — —
[Θῶθ . ἀ]πὸ τ(οῦ) Μελίτ(ωνος) [— — —
[[.] Μηνᾶ χορτα( )]]
[Φ]αῶφ(ι) κε ....λ[— — —
κη Ἀβρ̣α[ὰ]μ̣[— — —

3. The author first wrote ἡμερ/ξ γι/ and consequently was about to omit the total of daily consumption. 14. Not ἀπὸ.

The right half and the end of the account are lost. The width of ll. 3-4 may be reckoned at 9 cm. As the writing starts at a distance of 1,5 cm. from the left edge of section 5, lines 3-4 must have covered section 6 over a distance of (1,5 + 9) — 8 = 2,5 cm. The sections, resulting from the folding of our document, had a width of 8 cm., cf. p. 9.

Translation (ll. 1-5) :

Maintenance of donkey drivers during the 8th indiction. Feeding of 14 pack-donkeys, receiving 12 bundles, during 60 days extending from *1st Pharmouthi* until 30th Pachon, at a daily expenditure of 3 loads *18 bundles : 201 loads / 30 bundles.* And on 1st Payni 4 animals were bought ; *daily expenditure : 4 loads / 16 bundles,* total : 129 loads / 30 bundles. *From Epeiph onwards* they have taken delivery of :

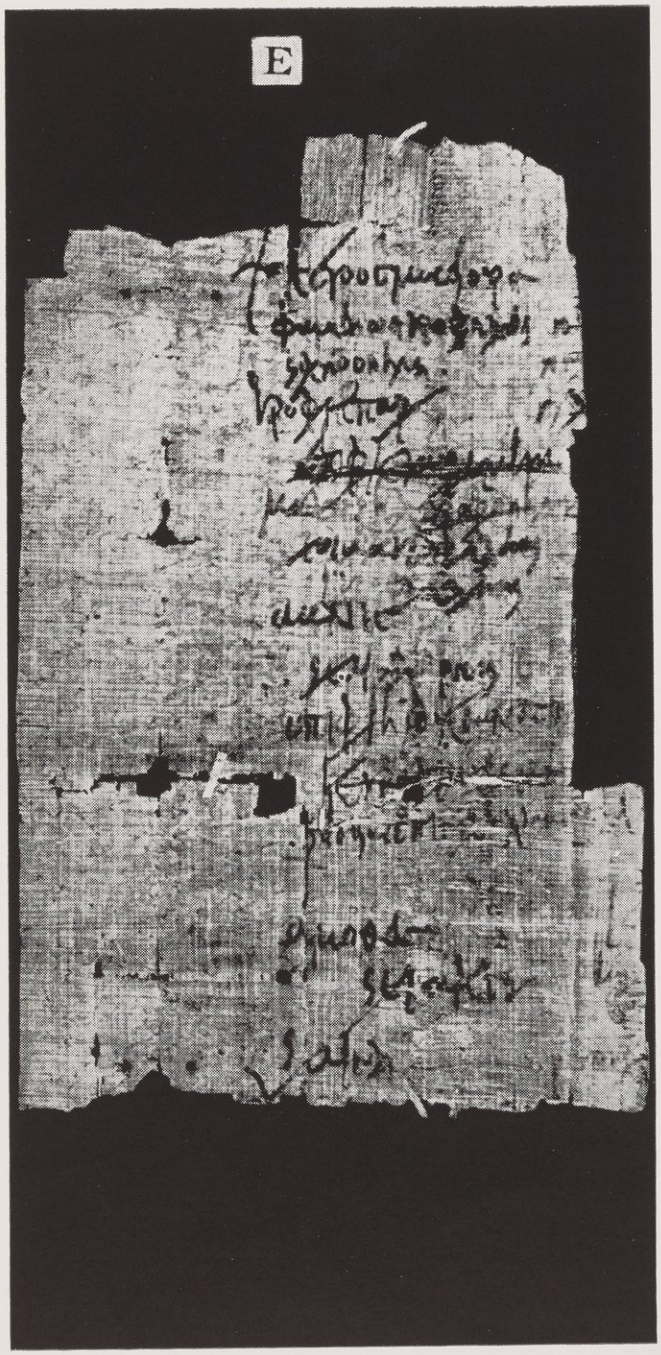
4. 4 *gomoi* 16 *ankalai* : daily consumption of 14 + 4 asses, receiving 12 *ankalai* per head.

5. During 1st Pharmouthi-30th Payni the first troop of asses consumed 201 *gomoi* 30 *ankalai* + 129 *gom.* 30 *ank.* = 331 *gom.* 10 *ank.* The sum total has not been made by the author of our document. ἔχουσι ἀπὸ μηνὸς Ἐπίφ : from here onwards, anticipation of year 9 begins. Cf. p. 11.

14. The entry concerns a delivery of the same type as those that are recorded, for the 8*th year*, in **II 7**. The meaning of ἀπα( ) is obscure.

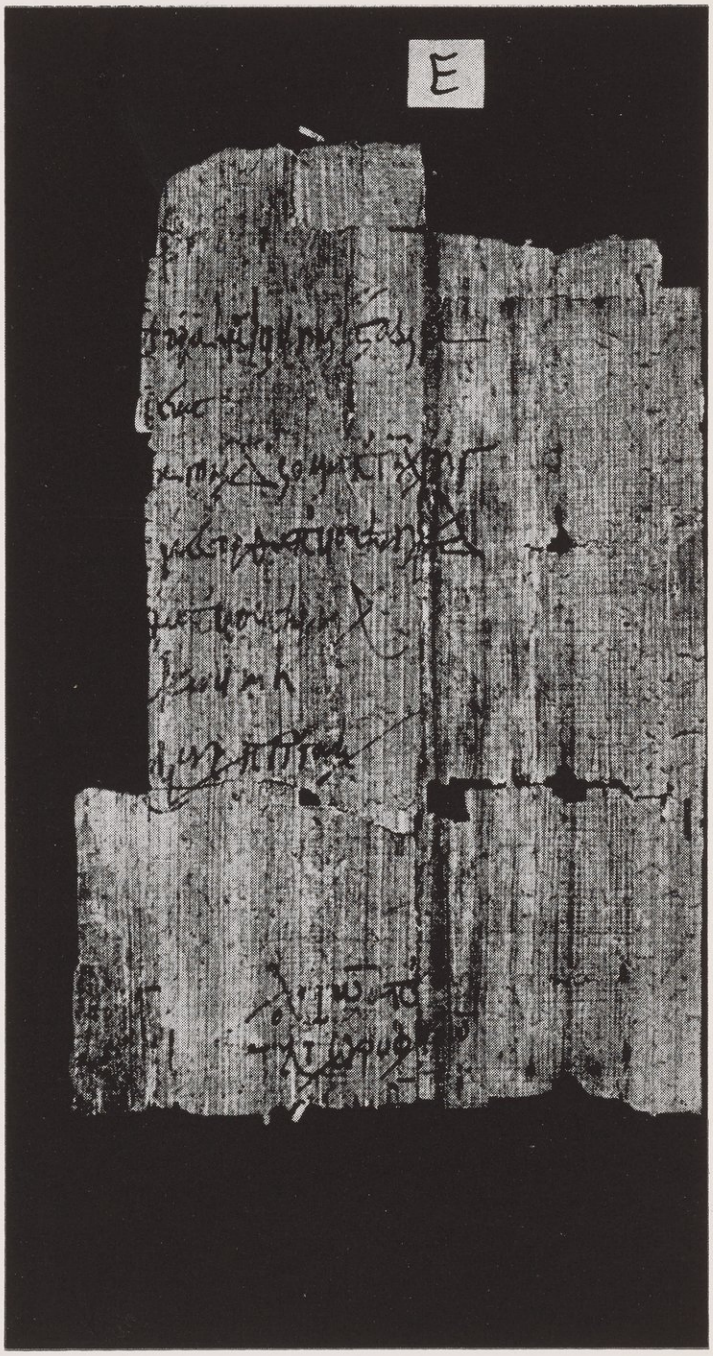
16. ζ(ώοις) Ἀβραάμ : either « (conveyed) by A.'s animals » or « (delivered) for (the maintenance of) A.'s animals ». The first solution is preferable. Part of the provisions obtained from elsewhere appears to have been transported by the recipients themselves, cf. also ll. 18, 21, 23.

PLATE I



Second Sheet, Section 1, recto
(Account **II 1**)

PLATE II



Second Sheet, Section 1, verso
(Accounts **II 22**, **23** and **24**)

17. ζ *ἰνδ.* : this is a further proof (cf. pp. 26 and 28) of provisioning difficulties at the beginning of the year. Whether the provisions in question were received or bought, they were of inferior quality, for hay that had been produced as long ago as the 7th year, must have become fuggy and dusty, and must have lost to a large extent its feeding value.

18 and 21 are probably dealing with provisions that had been conveyed by Menas. Although *χόρτα* has no mark of abbreviation, it can hardly be considered as a heteroclitic plural of *χόρτος*. The meaning is obscure.

Section 6

This section has entirely disappeared. It contained the right end of **II 9**, 2-4, which can easily be restored, and, next to it, a narrow column, whose loss is rather unfortunate, for it probably recorded the provisions from which the expenditure of **II 10** was made. The existence of this column is proved by the fact that faint traces of writing are visible at the left edge of section 7. They cannot belong to the right end of **II 9**, because the writing of that account cannot have extended over 14,5 cm. (1) ; its maximum width did not exceed 9 cm., cf. p. 56.

Section 7

Fragment A : upper half of the fragment : 6,8 × 16 cm. (2) ; lower half 6 × 11,5 cm. The major part of this section has consequently been preserved.

χ[—

II 10 1 (*ὑπὲρ*) *Φαρμοῦθ*(*ι*) *οι*[—

† *ἔχουσιν σταυλῖτ*(*αι*) ..[.... *τροφ*(*ὴ*) *μουλαρ*(*ίων*) *ιδ ἀπὸ ἀγκ*/ *κδ ἀπὸ Φαρμοῦθ*(*ι*) *ζ*]

(1) 8 - 1,5 cm. of section 5 (cf. note on **II 9**) + 8 cm. of section 6.

(2) The right-angled tear at the upper edge of this fragment should be filled up with a small fragment which has been wrongly connected with E, cf. p. 46, n. 1.

ἕως Παχὼν κδ ἡμερ(ουσίως) γόμ/ ς [ἀγκ/ λς γί(νεται) γόμ/
τκβ ἀγκ/ κη — —]
εἰς ιε ἀπὸ ἀγκ/ κ ἕως [Παῦνι λ ἡμερ(ουσίως) γόμ/ ς γί(νε-
ται) γόμ/ σις (ὁμοῦ) γόμ/ φλη ἀγκ/ κη]
γί(νεται) λαβῖν (ὑπὲρ) τῶ(ν) Φαρμοῦ[θ(ι) ζ ἕως Παῦνι λ
ἡμερ(ῶν) πδ γόμ/ .. ἔχουσιν]
Ἐπὶφ ε ἀπὸ Βουσήρ(εως) γ(όμ.) κδ (καὶ) ἀ[πὸ — — — —
— — — — — (ὁμοῦ)]
γόμ/ σδ ⟦λ(οιπὸν) ἔχει γόμ/ λς⟧ ἕως .[. . . . . γόμ/ .. (ὁμοῦ)
γόμ/ ... λ(οιπὸν) ἔχει γόμ/ ..]
ϙϛδ
ιγ ἀγκ/ κβ

1. The initial line of this account seems to have been a heading, comparable with **II 9**, 1 and **II 19**, 1. *ὑπὲρ Φαρμοῦθι* appears to have been followed by a specification of the animals whose maintenance would be dealt with in the account ; it probably consisted of an adjective (*οἰκο*— ?), followed by *μουλαρ*( ). On top of *οι*[—, another word has been added. 2. after *σταυλῖται* a word meaning « load » or a metrological term will have to be restored ; neither *gomos* nor *mouion* are suitable.

This column seems to have extended over c. 14 cm. Its writing starts at a distance of 1,7 cm. from the left edge of section 7 and must consequently have covered section 8 up to its right edge (1,7 + 14 = 15,7 cm. ; section 7 + section 8 = 16 cm.)

Translation :

On account of Pharmouthi — — — The stablemen have taken delivery of . . . *loads. Feeding of 14 mules, receiving 24 bundles, from 7th Pharmouthi,* until 24th Pachon, at a daily expenditure of 6 loads / *36 bundles : 322 loads 28 bundles* . — — — For 15 animals, receiving 20 bundles, until *30th Payni, at a daily expenditure of 6 loads : 216 loads. In all : 538 loads / 28 bundles.* They ought to receive on account of the *84 days extending from 7th* Pharmouthi *until 30th Payni . . . loads. They have received* from Bousiris on 5th Epeiph 24 loads and from — . . *loads and from — . . loads, in all :* 204 loads, ⟦He has a surplus of 36 loads⟧ and until (e.g.) *1st Mesore . . loads, in all . . . loads. He has a surplus of . . loads.*

1. *ὑπὲρ Φαρμοῦθι* : in actual fact, the account deals with Pharmouthi-Payni. The heading merely intends to distinguish the present account from a former one (belonging to sheet I) which dealt with the animals' maintenance during the initial months of the year.

2. In our document *ἔχειν* is always used in connection with receipts (cf. **II 9**, 5 ; **II 18**, 4 ; **II 21**, 8 and 15), not with animals. In the present case *ἔχουσι* was probably followed by a total of receipts. *μουλαρ(ίων) ιδ, ἀγκ/ κδ* : the restoration is based on the short note that has been written under the account : *ιγ ἀγκ/ κβ*. This is twice the daily consumption of 14 animals, receiving 24 *ank.* per head.

3. The total of consumption may have been followed by a short mention of the troop's reinforcement.

5. If our restoration is correct, one ought to understand « on account of the 84 days between (*ἀπὸ* should be understood) 7th Pharmouthi and 30th Payni ». In any case the sum introduced by *γί(ν.) λαβῖν* must have been owed to the *stablitai* by the estate (1) ; if l. 5 were calculating the total of consumption during Pharmouthi-Payni, it would be introduced by (*δμοῦ*). *ἔχουσιν* introduces the author's anticipation of the 9th year, cf. **II 9**, 5.

7. *γόμ/ σδ* : rather a sum total of receipts than the amount of an individual receipt. *λ(οιπὸν) ἔχει* : a transition from the plural (cf. l. 2) to the singular also occurs in **II 21**,15. 204-36 = 168 *gomoi* ; this amount might be interpreted as being the total of consumption of 15 animals during 28 days (1st-28th Epeiph), if we were sure that the arrears of the previous period have not been recovered out of these 204 *gomoi*. Anyway, it is interesting to notice that the author knew the total of consumption after 1st Epeiph, although he did not calculate or mention it explicitely. The same applies to his accountancy in **II 14**, 6 and **II 18**, 5. The calculation of the surplus had to be erased because the author (in his usual hurry) had forgotten a number

(1) The total of receipts mentioned in l. 2 does not seem to have been sufficient to cover the 538 *gomoi* 28 *ankalai* of l. 4. — Debts owed by the estate to its stablemen were introduced by *γί(νεται) λαβῖν* in the present account and in **II 14**, 6 ; by *ὥστε λαβῖν* in **II 18**, 5.

of receipts. Instead of mentioning them individually, with their proper dates, he seems to have written : *ἕως* (e.g.) *Μεσορὴ α* (1) followed by the total of the omitted deliveries.

ϱϙδ : is a first isolated note. It may refer to the total of omitted deliveries. In that case the end of l. 7 could be restored : *γόμ/ ϱϙδ (δμοῦ) γόμ/ τϙη λ(οιπὸν) ἔχει γόμ/ σλ.*

ιγ ἀγκ/ κβ : cf. comm. l. 2. As there is nowhere question of 14 animals receiving 24 *ank.* per head for a period of *two* days, the question arises why this note has been written down. In our opinion, it was part of en effort to check the correctness of the total mentioned in l. 3. To find the multiplication sum of 6 *gomoi* 36 *ank.* × 48 (total of days between 7th Pharmouthi and 24th Pachon) the normal procedure would have been to convert 6 *gom.* 36 *ank.* into 336 *ank.*, multiply 336 with 48, and divide the sum thus obtained by 50. The quicker way was the following : to consider the result of the first operation as 336 *gomoi* (instead of *ankalai*) and to subtract from it twice the multiplicand. *ιγ ἀγκ/ κβ* (6 *gom.* 36 *ank.* × 2) has been automatically written down by the author in the course of his mental calculation.

II 11 1 *λό(γος) χορτ(ικῆς) τροφ(ῆς) βοῶ(ν) Σκελαί(ων) .[*
Ἀβραὰμ γ(όμ.) ϱξ
Σερῆνος γ(όμ.) σο ιδ̣[
Φοιβάμμ(ων) γ(όμ.) σ
5 *Μηνᾶς σκ[δ]*
(δμοῦ) ωξ̣η μ(ούεια) υλδ

3. After *σο* an additional delivery of 14 *gomoi* seems to be recorded. As opposed to the « additional deliveries » of **II 2**, it has been included in the total of 868 *gomoi*.

The account deals with the same troop of *βόες* as **II 5** and very probably concerns their maintenance during Pharmouthi-Payni (2). The

(1) Cf. **II 22**, 2.

(2) 5th or 7th Pharmouthi - 30th Payni, like the other troops of the series **II 10 - II 17**.

related account of expenditure was probably situated to the right of **II 11**, and has disappeared together with the rest of section 8.

II 12

μ(ούεια) βρξξ ζ	
ἐξ( ) εἰς τὸ Σκέλος	μ(ούεια) ἀχο[.]
εἰς Κῦσιν	μ(ούεια) νκ[.]
εἰς Ταλὶ	μ(ούεια) μθ
εἰς Βούσηρ(ιν)	μο(ύεια) ιγ

2. ἐξ( ); cf. **I 6**, 10. 5. The abbreviation consist of μ, with a small o on top.

The account is complete.

This account summarizes the receipts that have been listed in the accounts of receipts of the first class (**II 1**, **II 2** and a few accounts that are lost). It is related with a series of accounts of expenditure (**II 13-20**). **II 12** has been dealt with on p. 13 and p. 21, n. 1. Cf. also p. 16.

Section 8

Part of its upper half was covered, up to the right edge, by **II 10** (cf. supra). The rest of the upper half (facing **II 11**) was probably occupied by an account recording the maintenance of *βόες Σκελαῖοι* during 5th or 7th Pharmouthi - 30th Payni, and anticipating the accountancy of receipts of the 9th year. Section 8 has entirely disappeared.

VERSO

Section 8-7 (*Fragment* A)

II 13 1 [τροφ(ὴ) καμ(ήλων) δ τῶ(ν) ἀπὸ Φαρμοῦθ(ι) ζ ἕως Παχὼν κ]· ἡμερ(ῶν) μ[.]η ἡμερ(ουσίως) γόμ/ α ἀγκ/ ι

2 (blank) γί(νεται) γόμ/ νζ
3 [..... εἰς ε ἕως Παῦνι λ ἡμ(έραι) λ]ς ἡμ(ερουσίως)
γόμ/ α ἀγκ/ κε γί(νεται) γ/ νδ
4 [—circa 29 letters—] . γί(νεται) γ/ ιε

1. μη : η is a correction of α or β.

Line 1 extended over c. 13 cm. As it finished at a distance of 1 cm. from the right edge of section 7 verso, it must have started at a distance of 2 cm. from the left edge of section 8 verso, i.e. at 4 cm. from the left edge of the sheet (section 8 was preceded by a 2 cm. margin, cf. p. 9). The writing of this account is smaller than that of **II 14** and **II 17**.

Translation :

Feeding of 4 camels during 48 days *extending from 7th Pharmouthi until 24th Pachon*, at a daily expenditure of 1 load/10 bundles : 57 loads. — — — — *For 5 animals until 30th Payni, 36 days*, at a daily expenditure of 1 load/25 bundles : 54 loads. *They have received* (*on account of Epeiph*) *from* — . *loads, and from* — . *loads*, total : 15 loads.

1. καμ( ) : the restoration is not certain, cf. p. 19.
2. νζ : actually 57 *gomoi* 30 *ankalai*, cf. p. 39.
3. The line probably opened with a short mention of the troop's reinforcement, cf. **II 10**, 3.
4. Probably : ἔχουσι ἀπὸ . . . . . γόμ(ους) . (καὶ) ἀπὸ . . . . γόμ(ους) ., i. e. anticipation of year 9. The sum of 57 and 54 does not seem to have been calculated.

II 14 1 [τροφ(ὴ) ζξ/ γεουχ(ικῶν) γ ἀπὸ ἀγκ/ ιε τῶ(ν) ἀπὸ Φα]ρ-
μοῦθ(ι) ⟦ε⟧ ⟦α⟧ ζ ἕως Παχὼν κς
[ἡμ(ερῶν) ν ἡμερ(ουσίως) ἀγκ/ με γί(ν.) γ(όμ.) με εἰς
⟦....]..⟧ ζ(ῶα) ε ἀπὸ ἀγκ/ ιε
[ἕως Παῦνι λ ἡμ(έραι) λδ γί(ν.) γόμ/ να (δμοῦ) γόμ/] ϙς
τροφ(ὴ) πωλαρ(ίων) γ
[ἀπὸ ἀγκ/ κε ἀπὸ Φαρμοῦθ(ι) ε ἕως τῆς α]ὐτῆς γόμ/ ρκθ
ω̣σ̣ο̣ν̣ γ/ ψι[.]

5 [ἔχουσι ἕως τῆς αὐτῆς γ/ σπθ λ(οιπὸν) γό]μ/ ξδ γί(ν.) (ὑπὲρ)
μη(νὸς) Ἐπὶφ
[ἀπὸ γόμ/.θ ἀπὸ γόμ/ .]ζ (ὁμοῦ) γόμ/
μς λ(οιπὸν) γί(ν.) λαβῖν
[γόμ/...

3. ⟦ε⟧ belongs to an interrupted ἕως ; ⟦α⟧ is a wrong date.
The account seems to have extended over the same width as **II 13** ; of each line some 24 letters are missing (c. 29 in the previous account, but its writing is smaller).

Translation :

Feeding of 3 pack-donkeys belonging to the estate and receiving 15 bundles, during 50 days extending from 7th Pharmouthi until 26th Pachon, *at a daily expenditure of 45 bundles : 45 loads. For* 5 animals, receiving 15 bundles, *until 30th Payni, 34 days : 51 loads. In all :* 96 loads. Feeding of 3 young foals, *receiving 25 bundles, from 5th Pharmouthi until the* same day : 129 loads. Total (?) : 710 loads. *Until the same day they have taken delivery of 289 loads; surplus :* 64 loads. On account of Epeiph they have received *from — .9 loads and from —* .7 loads, in all : 46 loads. They ought to receive (on account of Epeiph) a remainder of . . *loads.*

1. (ὑπο)ζ(υγίων) ζ(ώων) γεουχ(ικῶν) ; our restoration is based on the distinction, made by the author, between *ὑποζύγια ζῷα ὀνηλατῶν* (cf. **II 1**, 3 and also **II 9**, 1) and *ὑποζύγια ζῷα ἡμέτερα* (cf. **II 1**, 2, 7, 8) or *γεουχικά* (cf. **II 2**, 10). As **II 9** is dealing with the maintenance of the *ὑποζύγια ζῷα ὀνηλατῶν*, the present account probably refers to the *γεουχικά*.

4. The end of the line (*ωσον γ(όμ.) ψι*[.]) appears to be a later addition, because the *θ* of the preceding number *ρκθ* has a prolonged cross-line, indicating the end of the line. The addition apparently gives a total, which is not the total of the expenses that have been mentioned in this account (96 + 129 = 225). It may concern the *year's* expenditure for the maintenance of *ὑποζύγια γεουχικά* and *πωλάρια*.

5. *γί(ν.) (ὑπὲρ) μη(νὸς) Ἐπίφ* : anticipation of year 9.

In section 8, at the left of **II 15** and **II 16**, a narrow account is missing. It dealt with the maintenance during 5th Pharmouthi - 30th Payni (cf. **II 16**, 1 : *ἡμερῶν πς*) of the two troops of *βόες* whose feeding during Phaophi-Hathyr is dealt with in **II 16**. The sum total of expenditure, recorded in the lost account, amounted, according to **II 16**, 1, to 620 *gomoi* (1). Anticipation of the 9th year seems to have been omitted ; it was probably recorded in **II 24**.

II 15 *ἀν(αλώματα)*

λό(γος) ἀναλωμ(άτων) η ἰνδ(ικτίονος)
(ὑπὲρ) τιμ(ῆς) ἀχ(ύρου) χ(όρτ.) γ(όμ.) χ
(ὑπὲρ) τιμ(ῆς) κουρ(ίων) β χ(όρτ.) γ(όμ.) φμ

II 16

1 *. .γι( ) ἡμ(ερῶν) π⟦δ⟧ς γ(όμ.) χκ*
(καὶ) (ὑπὲρ) βοῶ(ν) ς ἀπὸ Φαῶφ(ι) κγ
ἕως Ἀθὺρ λ ἡμ(έραι) λζ
γί(ν.) γόμ/ πη ἀγκ/ μ
5 *(καὶ) ἀπὸ κε ἕως Ἀθὺρ λ ἡμέρ(αι) λε*
ἡμερ(ουσίως) γ(όμ.) ς ἀγκ/ μ γί(ν.) γόμ/ σλη
(δμοῦ) γόμ/ ϡμς
. ἀπέθ(ανον) βοῶ(ν) γ γ/ λη λ(οιπὸν) ϡη

Translation :

Expenditure. Account of expenditure during the 8th indiction. Price of chaff : 600 loads of hay. Price of *2 kouria :* 540 loads of hay. — — — 86 days, 620 loads. And on account of 6 oxen from 23rd Phaophi until 30th Hathyr, 37 days : 88 loads/40 bundles. And from 25th (Phaophi) until 30th Hathyr, 35 days, at a daily expenditure

(1) According to **II 16**, the troops in question must have contained 6 + 17 —3 = 20 animals. At a rate of 20 *ank.* per head, they would have consumed in the course of 86 days 688 *gomoi*, whereas the actual consumption of the two troops did not exceed 620 *gomoi*. It is therefore likely that the number of animals was reduced between Hathyr 30th and Pharmouthi 5th.

of 6 loads/40 bundles : 238 loads. In all : 946 bundles. 3 oxen died ; 38 loads ; remainder : 908 loads.

II 15 concerns the use of *χόρτος* as a means of exchange in trade-operations. 600 gomoi were exchanged against a certain amount of chaff (its weight has not been indicated) ; 540 gomoi against two *kouria* (liquid measure) of an unknown product.

II 16 1. At the beginning of the line an adjective, specifying the troops in question, will have to be restored. — *πδ* would be exact if *χορτικὴ τροφή* had started on 7th Pharmouthi, as in **II 10**, 2, **II**, **13**, 1, **II 14**, 1, **II**, **17**, 1.

2. *Φαῶφι κγ* ought to be *κδ*.

4. The calculation is as follows : 6 animals × 20 *ankalai* × 37 days = 88 *gomoi* 40 *ankalai*.

5. The author indicates neither the number of animals, nor the daily ration per head. *κε* : again a mistake, instead of *κς*.

6. 238 *gomoi* : 17 animals × 20 *ank.* × 35 days.

7. 946 *gomoi* : the exact total is 946 *gomoi* 40 *ank.*

8. The same note will be repeated in **II 19**, 9-10. As 38 *gomoi* are equivalent to almost 32 daily rations of three animals, the three *βόες* in question must have died soon after 24th Phaophi. Of all the animals dealt with in our document, *βόες* were at the same time the most useful and the most difficult to keep. This is the reason why Columella devoted *De Re Rustica* VI 4-19 to the maintenance of *boves*.

II 17 [(*ὑπὲρ*) *ταύρ*(*ων*) ...( ) *ζ ἀπὸ Φαρμ*(*οῦθι*) *ζ ἕως Παῦνι λ*]
ἡμερουσί(*ως*) *γόμ*/ *γ ἀγκ*/ *κε*
[*γί*(*ν.*) *γ*(*όμ.*) *σϙδ* — circa 16 letters — *γό*]*μ*/ *κε*
γί(*νεται*) *γόμ*/ *μζ*

The account consisted of only two lines.

Translation :

On account of 7 — bulls, from 7th Pharmouthi until 30th Payni, at a daily expenditure of 3 loads/25 bundles : *294 loads. They have*

received (on account of Epeiph) from — 22 loads and again 25 loads, total : 47 loads.

1. *ταύρων* must have been further specified, for there were two troops of bulls. Owing to the narrowness of the available space, we have to assume that the author did not follow his usual formulation. Our restoration is based on **II 16**, 2-3.

2. After the indication of the total of consumption, anticipation of year 9 began. *γόμ/ μζ* : [22] + 25 *gomoi*.

SECTION 6-5 (*Fragment* D) (Plate IV)

II 18 1 [*τροφ(ὴ) ...( ) μουλαρ(ίων) ἀν(ηλώθη) (ὑπὲρ) μου*]*λ̣αρ(ίων) ιδ ἀπὸ ἀγκ/ κδ*

[*ἡμερουσί(ως) γόμ/ ς ἀγκ/ λς (καὶ) ὀμ(οίως)*] (*ὑ̣π̣ὲ̣ρ̣*) *μουλαρ(ίων) ς ἀπὸ ἀγκ/ κ*

[*ἡμερουσί(ως) γόμ/ β ἀγκ/ κ τροφ(ὴ) τ*]*ῶ̃(ν) ἀπὸ Φαρμοῦθ(ι) ἕως Παῦνι λ*

[*ἡμερ(ῶν) ϙ γόμ/ ωκ ἀγκ/ μ τροφ(ὴ) ἀ*]*πὸ Ἐπίφ ἔχουσι ἀπὸ*

5 [..... *γόμ/ ... ὥστ*]*ε λαβῖν (ὑπὲρ) το(ῦ) Ἐπὶφ μη(νὸς) γ(όμ.) πα*

[*ἔχουσι ἀπὸ ..... γ*]*όμ/* ⟦*λβ πληρο( ) Μεσορ(ὴ)*⟧

[*ξη ..... ἀπὸ Βου*]*σήρ(εως) γ(όμ.) ιβ γ(ίν.) π*

3. *Φαρμοῦθι* : scil. *α* 6. *πληρο(φορουμένους)*, paid in full?

The writing of l. 3 (longest line of the account) extended over 12 cm. It finished at a distance of 1 cm. from the right edge of section 5, and must consequently have started at 3 cm. from the left edge of section 6. This means that there was a distance of 4 cm. between the longest lines of **II 13** and **II 14** (finishing at 1 cm. from the right edge of section 7, cf. supra) and the present account.

TRANSLATION :

Feeding of — mules. On account of 14 mules, receiving 24 bundles, *there has been a daily expenditure of 6 loads/36 bundles, and again* on account of 6 mules, receiving 20 bundles, *a daily expenditure of* 2 *loads/*

20 bundles. Their feeding during 90 days extending from (1st) Pharmouthi until 30th Payni *amounts to 820 loads/40 bundles. Feeding* from Epeiph onwards : they have taken delivery of . . . *loads* from —, so that they ought to receive on account of Epeiph 81 loads. *They have received from* — ⟦32 loads, fully delivered in Mesore⟧ *68 loads* — — — *and from* Bousiris 12 loads, total : 80 (loads).

1. *μουλαρίων* : the word was probably preceded by a specification of the animals in question, for there were two troops of mules.

4. This is the sum of 604 *gom.* 40 *ank.* (14 animals × 24 *ank.* × 90 days) + 216 *gomoi* (6 animals × 20 *ank.* × 90 days). The total was followed by *τροφὴ ἀπὸ Ἐπίφ*, introducing the author's anticipation of the 9th year.

5. Although the author does not mention the number of *gomoi* consumed during Epeiph, he apparently knows it, for he is able to calculate that the animals' consumption exceeded the muleteers' receipts to an amount of 81 *gomoi*. Cf. our commentary on **II 10, 7.**

6-7 : record the payment of the arrears. Apparently they have *not* been repaid up to the last *gomos.*

II 19 1 [τροφ(ὴ) βοηλατ(ῶν) .....] η ἰνδ(ικτίονος)
[τροφ(ὴ) βοῶ(ν) ια ἀπὸ ἀγκ/ κ ἀπὸ Θ]ὼθ κ ἕως Φαῶφ(ι) ιβ
[ἡμερ(ουσίως) γ(όμ.) δ ἀγκ/ κ γί(ν.) γ(όμ.) ρα ἀγκ/ ι] γί(ν.)
γόμ/ ⸗κβ (καὶ) ἀπὸ ιγ ἕως Ἁθὺρ λ
[ἡμ(έραι) μη ἡμερουσί(ως) γόμ/ δ ἀγκ/ ι]δ̣ γί(ν.) γόμ/
σε ἀγκ/ κη (ὁμοῦ) γ(όμ.) ἀρκζ
5 [ἀγκ/ κη .... τροφ(ὴ) τῶ(ν) ἀπὸ Φα]ρ̣μοῦθ(ι) α ἕως Παῦνι ιε
[ἡμερ(ῶν) οε ἡμερουσί(ως) γόμ/] δ ἀγκ/ ιδ γί(ν.) γ(όμ.) τκα
[τροφ(ὴ) ἀπὸ ις ἕως Ἁθὺρ λ ἡμ/] ρ̣ο ἡμερουσί(ως) δ ἀγκ/ θ
(ὁμοῦ) μ(ούεια) ϸβπβε̣΄
ει( ) (ὑπὲρ) βουειδ(ίων) γ [ἃ]
ἀπέθανεν γ̣όμ/ λ̣[η]
λ̣(οιπὸν) μ(ούεια) ϸβξγε̣΄

The width of this column, except for ll. 8-11 is the same as that of **II 18.** The horizontal line may have met a vertical one at its left extremity, as was

the case in section 7, verso. It is not certain if any writing has been lost between lines 7 and 8. 8. the reading ε′ (1/5 th) is not certain.
9. ει( ) : the sense of the abbreviation is clear : « to be subtracted ». βουείδιον = βοίδιον, diminutive of βοῦς.

TRANSLATION :

Maintenance of — cattle-drivers during the 8th indiction. *Feeding of 11 oxen, receiving 20 bundles, from* 20 Thoth until 12th Phaophi, *at a daily expenditure of 4 laods / 20 bundles : 101 loads / 10 bundles.* Total : 922 loads. And from 13th (Phaophi) until 30th Hathyr, *48 days, at a daily expenditure of 4 loads*/14 bundles : 205 loads/28 bundles. In all : 1127 loads/*28 bundles.* ———— *Feeding during 75 days extending from* 1st Pharmouthi until 15th Payni, *at a daily expenditure of* 4 loads/14 bundles : 321 loads. *Feeding from 16th (Payni) until 30th Hathyr,* 170 *days :* daily expenditure of 4 loads/9 bundles. In all : 2082 1/5 measures. To be subtracted on account of 3 oxen that died : 38 loads ; remainder : 2063 1/5 measures.

1. After βοηλατῶν a specification of the team in question.

3. 922 *gomoi* : sum of 820 *gom.* 40 *ank.* (cf. **II 18**, 4) + 101 *gom.* 10 *ank.*

7. The author's anticipation of the 9th year will be continued in **II 20**. Line 7 is the only example of an anticipation containing details about the daily ration per head. ἡμ(έραι) ϱο : this shows that the 9th year was a normal year, containing 5 Epagomenai.

8. ϧπβε′ : 2082 1/5 *mouia* are equivalent to 4164 *gomoi* 20 *ank.* This is the sum of the expenses which have been recorded in **II 13 - II 19**, *as far they were made during the 8th year* (1) :

II 13	7th Pharmouthi - 24th Pachon	57 *gomoi*
	25th Pachon - 30th Payni	54
II 14	7th Pharmouthi - 26th Pachon	45

(1) It is absolutely certain that expenses, made during the initial months of year 9, have not been included in this total. The reckoning of **II 18-19**, which is continuous, does not take account of the data which are mentioned in **II 18**, 5-7.

	27th Pachon - 30th Payni	51	
	5th Pharm. - 30th Payni	129	
II 15	*analomata* for trade	600	
		540	
lost account : 5th Pharm. - 30th Payni (cf. **II 16**, 1)		620	
II 16	24th Phaophi - 30th Hathyr	88	*gomoi* (40 *ank.*) (1)
	26th Phaophi - 30th Hathyr	238	
II 17	7th Pharmouthi - 30th Payni	294	
II 18	1st Pharmouthi - 30th Payni	820	*gomoi* 40 *ank.*
II 19	20th Thoth - 12th Phaophi	101	*gomoi* 10 *ank.*
	13th Phaophi - 30th Hathyr	205	*gomoi* 28 *ank.*
	1st Pharmouthi - 15th Payni	321	
		4164	*gomoi* 28 *ank.*

If our reading '$\beta\pi\beta\varepsilon'$ is correct (the ε' is uncertain), the author has slightly simplified the sum he had to convert into *mouia* (4164/20 instead of 4164/28).

These expenses were covered, as has been said, by the deliveries of the first class ; they amounted to 2167 *mouia* = 4334 *gomoi* (cf. **II 12**, 1).

9. In the course of his calculation, the author, on reaching **II 16**, seems to have taken into account the total of 946 *gomoi* (**II 16**, 7) instead of the exact total of 908 *gomoi* (**II 16**, 8). He therefore had to subtract from his 2082 1/5 *mouia* 38 *gomoi* = 19 *mouia* (2). It is also possible that the subtraction was first made in **II 19**, and afterwards in **II 16**. Line 8 of the latter account may have been inserted after the following account (**II 17**) had been written already.

(1) The 40 *ankalai* have not been taken into account, cf. **II 16**, 7 : 946 instead of 946 *gomoi* 40 *ankalai*.

(2) The conversion of these 38 *gomoi* into 19 *mouia* seems to have taken place tacitly ; cf. **II 2**, 16.

Section 4-3 (*Fragment* C (Plate IV) and *Fragment* B)

II 20

1 [† *λό(γος) τρ]οφ(ῆς) Φαναμ(ϊέως)*
[*ἀπὸ Φ*]*ί̣β(ιος) γ(όμ.) ξς*
[*..*]*... κδ ἀπὸ τ/ γ(όμ.) δ*
[ ] *κζ ἀπὸ τ/ γ(όμ.) μη*
5 [*ἀπὸ*] *Πακενί(ου) γ(όμ.) κζ*
[*κ*]*θ ἀπὸ Φίβ(ιος) γ(όμ.) μ*
[*λ*] *ἀπὸ το(ῦ) αὐτ(οῦ) γ(όμ.) ις*
[*ἀπὸ*] *Θανεκ(ὼς) γ(όμ.) νς*
[*ἀπὸ*] *Φίβ(ιος) ζ(ᾠοις)ι γ(όμ.) μ*
10 [*..*] *επ.. Ἡλία γ(όμ.) ιβ*
[*ἀπὸ*] *Φίβ(ιος) γ(όμ.) λς*
[*ἀπὸ*] *Βουσήρ(εως) ζ(ᾠοις) β γ/ η*
ἀπὸ Φίβ(ιος) γ(όμ.) οβ
ἀπὸ Τησνοῦβις γ(όμ.) ις
15 *ἀπὸ Βουσήρ(εως) γ(όμ.) μ*
ἀπὸ Τησνοῦβις γ(όμ.) ξδ
ἀπὸ Βουσήρ(εως) γ(όμ.) λς
ἀπὸ το(ῦ) Μελ(ίτωνος) γ(όμ.) κδ
[*ἀ*]*π̣ὸ Τη̣σ[νοῦβις] γ(όμ.) νς*
20 [*ἀπὸ*] *Φ*[*ίβ(ιος) γ(όμ.) ξ̣ζ̣*
[*ἀπὸ γ(όμ.)*] *ρ̣ιβ*
[ ] (*δμοῦ*) *γ(όμ.) ωμ*
[ ]*.ō χορτα̣*
[ ] — — — —

II 21

1 † *τροφ(ὴ) ταύρ(ων)*
..χ/ ζ ἀπὸ ἀγκ/ κε
τῶ(ν) ἀπὸ Φαρμ(οῦθι) α
ἕως Παῦνι ιδ
5 *γί(ν.) ἡμέρ(αι) οδ*
ἡμερ(ουσίως) γ/ γ ἀγκ/ κε
γί(ν.) γόμ/ σνθ
ἔχουσι δὲ ἕως
τῆς αὐτῆς
10 *γ(όμ.) τκβ*
.ἀπὸ Φίβ(ιος) γε̣ο̣ργ(οῦ)
γ(όμ.) κβ
λ(οιπὸν) χ̣ό̣ρ̣τ̣(ου) γ(όμ.) πε
τ̣ρ̣οφ̣(ὴ) ἀπὸ ιε
15 *ἔχει Μ̣ο̣... ἀπὸ*
Μηνᾶ ἐπικ( )
γ(όμ.) μη

The distance between the two accounts was 6,5 cm. At the bottom of **II 20** a few lines may be missing ; **II 21** on the contrary is complete (the lower half of fragment B, verso, is blank).

II 20 3. The name of the month ought normally to be Payni. If the author has written Pharmouthi 24 (which is a possible reading (1)), he has made a

(1) [*Φα*]*ρ̣μ̣ο̣*[*ῦ*]*θ̣(ι)*.

mistake, for there is no connection between **II 2**, 8-10 (recording Phib's deliveries to Phanamieus on 21st Pharmouthi of the 8th year) and **II 20**, 2-4, 6-7, 9, 11, 13, 20. The abbreviation *τ/* (repreated in 4) probably means *τοῦ αὐτοῦ*. 23. cf. **II 9**, 18 and 21.

The account is connected with **II 19** and gives a survey of the provisions, received by Phanamieus on account of the 9th year. They were to cover the consumption of 11 *βόες* during the period extending from 16th Payni until 30th Hathyr (cf. **II 19**, 7). Phanamieus' receipts amounted, according to **II 20**, 22, to 840 *gomoi* ; the total of consumption does not seem to have been calculated by the author in **II 19**, but can easily be computed : 4 *gomoi* 9 *ankalai* × 170 = 710 *gom.* 30 *ank.*

2. *γ(όμ.) ξς* and 20 : *γ(όμ.) ξζ*, both delivered by Phib, remind us of the amount of Phib's « additional deliveries » in **II 2**, 6, 8, 11.

14. *Τησνοῦβις* : may be an alternative spelling of *Τεσενοῦφις* (1). We do not know whether the person in question belonged to the category of producers or to that of *stablitai.*

II 21 11. l. *γεωργοῦ* 14. Between 14 and 15 a symbol, resembling *Ω* ; we ignore its significance 16. *ἐπικ( )* either refers to Menas (*ἐπικείμενος*), or to the nature of the delivery. The latter is more likely.

TRANSLATION :

Feeding of 7 — bulls, receiving 25 bundles, during 74 days extending from 1st Pharmouthi until 14th Payni, at a daily expenditure of 3 loads/25 bundles : 259 loads. They have taken delivery, until the same day, of 322 loads and (have also received) 22 loads from Phib, the labourer ; surplus : 85 loads of hay. Feeding from 15th (Payni) onwards : Mo . . . has received from Menas — — 48 loads.

2. The abbreviation after *ταύρων* probably contained a specification of the troop that would be dealt with in the account. Two troops of bulls were kept by the estate at To Skelos.

(1) Cf. PREISIGKE's *Namenbuch*, s. v. The name was borne both by men and women.

10. The provisions in question have not been included in the total of 2167 *mouia*, covering the expenses that are recorded in **II 13 - II 19**, for otherwise the consumption of 259 *gomoi* (= 129½ *mouia*) would have been added to the 2082 1/5 *mouia* of **II 19**, 8. Although there has been a considerable space between **II 20** and **II 21**, it is unlikely to have been occupied by an account in which the provenance of the bulls' supplies was explained (1). In our opinion that provenance has been dealt with in **I 6**, 10-13 ; cf. our commentary on **I 6**.

14-7 : anticipation of the 9th year.

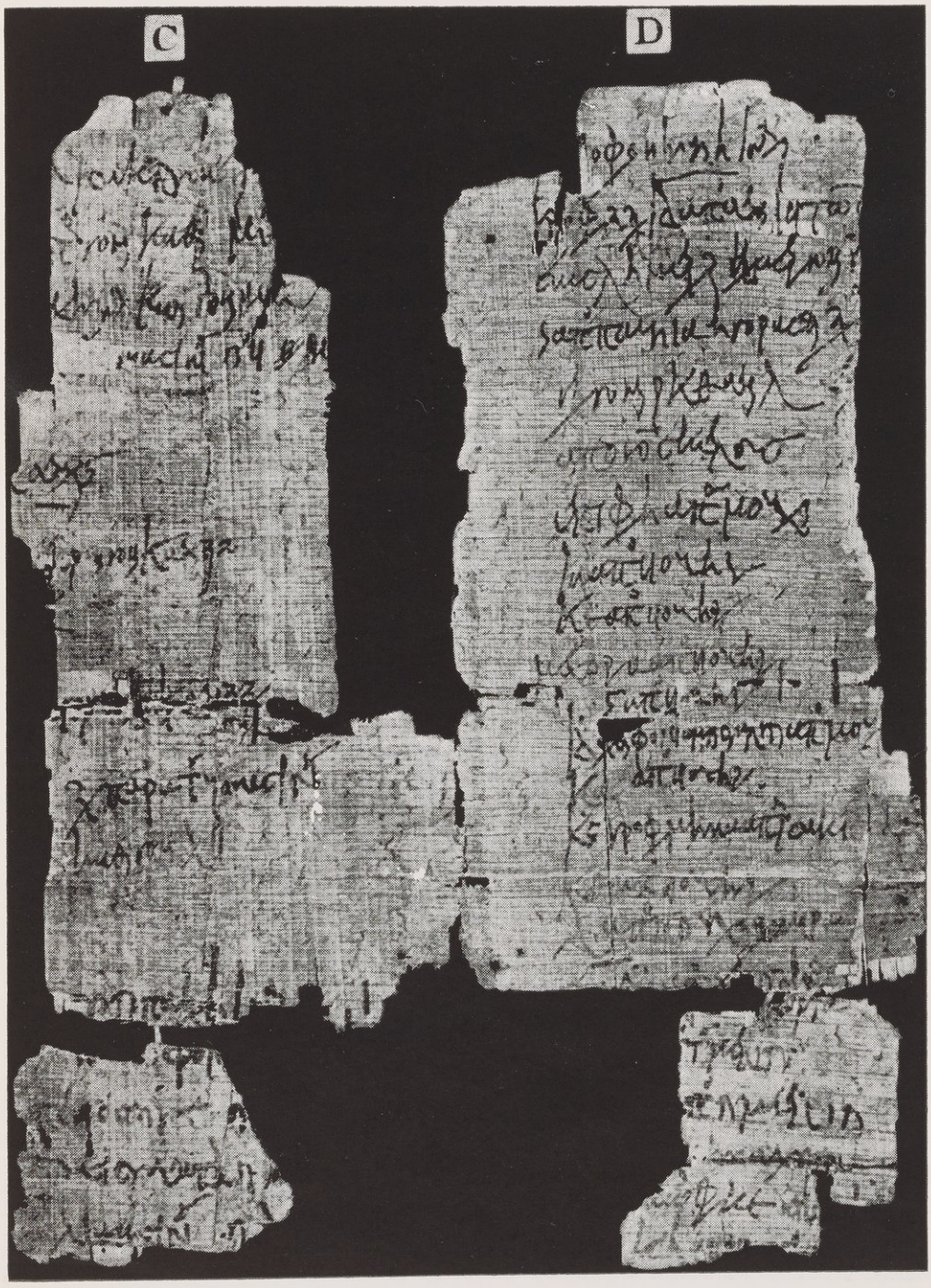
Section 2-1 (*Fragment* E) (cf. Plate II)

II 22 1 [τροφ(ὴ) ..( ). ἀπὸ Φαρμοῦθ(ι) α ἕως Παῦνι λ ἡμ]ερ(ουσίως) γ(όμ.) α ..[.]
[γί(ν.) γ(όμ.) ... ἔχουσι ἀπὸ ..... ἕως M]εσορ(ὴ) α ἡμ( )ου( ) ιβ γί(ν.) γόμ/ ις ἀγκ/ μ
[(καὶ) ἀπὸ ..... ἕως ..... γ(όμ.) .. (καὶ) ἀπὸ Φί]β(ιος) ἕως
[γ(όμ.) .. c. 26 letters —] . α γόμ/ δ (καὶ) ὁμ(οίως) ἀπὸ το(ῦ) αὐ(τοῦ) χρ( ) γ(όμ.) γ
5 [— c. 29 letters —] Μεσορ(ὴ) θ ἀπὸ Βουσήρ(εως) γ(όμ.) κδ
[— c. 29 letters —]θ ἀπὸ Βουσήρ(εως) γ(όμ.)[[λ]]
[— c. 26 ll. — ἀπὸ Ἰ]ακῶβ γ(όμ.) η
[— c. 21 ll. — (ὁμοῦ) γ(όμ.) ... ἐτε]λ(ειώθη) διαγρ(αφὴ) πιττακ(ίων)

The width of ll. 4-5 may be reckoned at c. 12,5 cm. They finish at a distance of 1 cm. from the right edge of section 1, and consequently must have started at 2,5 cm. from the left edge of section 2. There has been a space of 4,5 cm. between **II 21** and the present account. 2. ἡμ(έραι) cannot be read, for the abbreviation consists of ημ, with a ligature of ου on

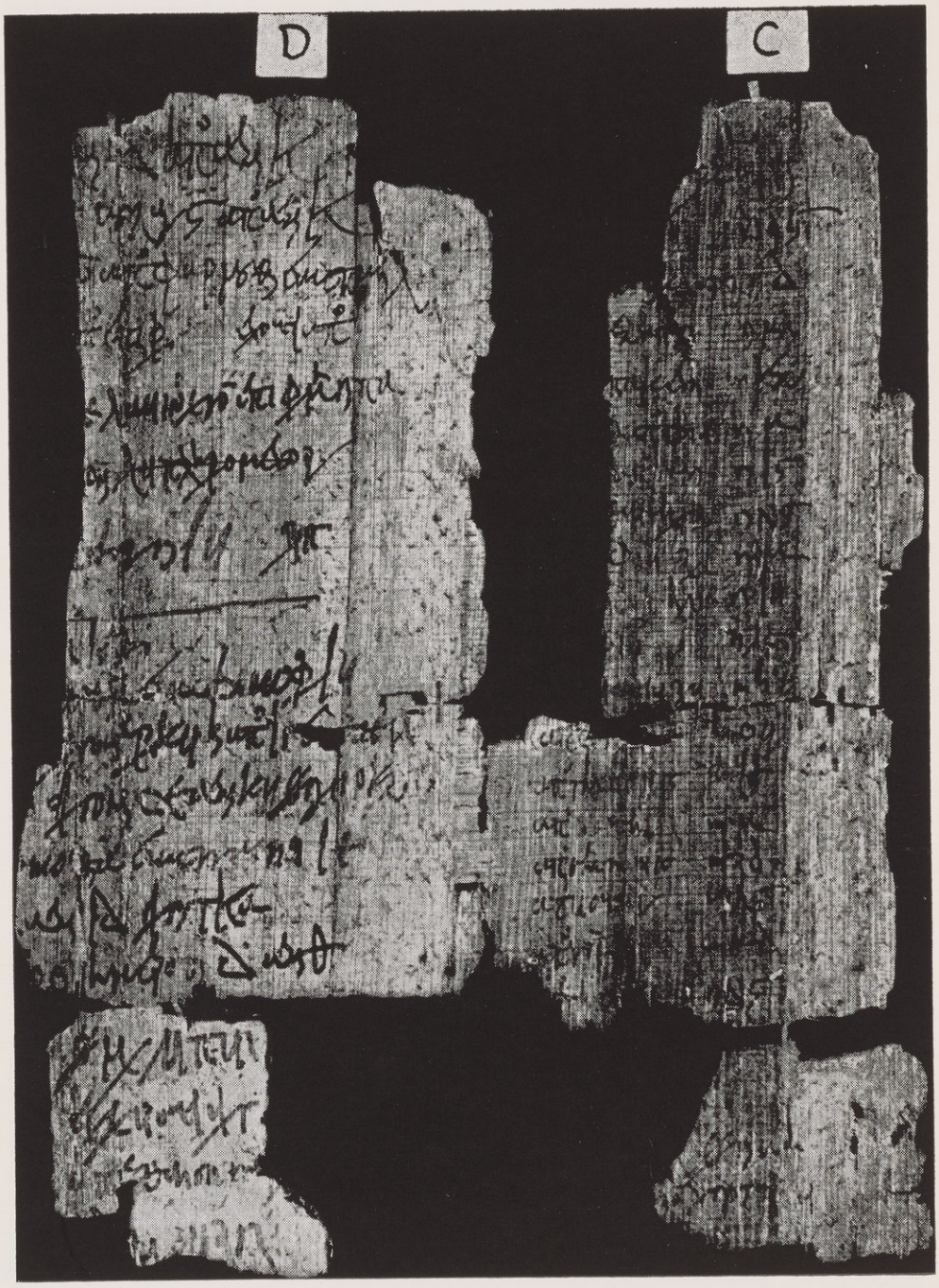
(1) After **II 20** there is a margin of 2 cm., before **II 21** a margin of 1,5 cm. This means that only 3 cm. of the available space (6,5 cm.) can have been covered with writing.

PLATE III



Second Sheet, Sections 4 and 5, recto
(Accounts **II 7**, **8** and **9**)

PLATE IV



Second Sheet, Sections 4 and 5, verso
(Accounts **II 18, 19** and **20**)

top. The problem will be further discussed in our commentary. 3. after ἕως a small α might be read. It is not clear whether the writing has been interrupted or erased. At any rate, the resulting lacuna has not been completed by the author. 8. the λ has no abbreviation mark ; the word may have been written ετελ$^{\theta}$.

TRANSLATION :

Feeding of x — from 1st Pharmouthi until 30th Payni, at a daily expenditure of 1 load — — : . . . *loads. They have received* (*on account of Epeiph*) *from — until* 1st Mesore 12 hem( ) = 16 loads/40 bundles, *from — until* — — . . *loads, from* Phib until . . *loads, from — until/on* — — 4 loads, and again from the same village (?) 3 loads, *from — until /on* — — . . *loads*, from Bousiris on 9th Mesore, 24 loads, *from — on* — — . . *loads*, from Bouseris on .9th — ⟦30⟧ loads, *from — on* — — . . *loads, from* Iakob on — — 8 loads. *In all* : . . . *loads.* The copying of the accounts has been completed.

The provisions received for χορτικὴ τροφή during Pharmouthi-Payni seem to have been recorded on sheet I, for the present account has no connection with any of the accounts of receipts that are known to us. In this respect **II 22** resembles the previous account.

2. From ἔχουσι onwards, anticipation of the 9th year. ημ( )ου( ) : ἡμ(ιόν)ου(ς) is not convincing, for each of these animals would only have carried 1 *gom.* 20 *ank.*, whereas a donkey-load amounted to 4 *gomoi.* If the number of *gomoi* equivalent to 12 ἡμ( )ου( ) were 18 (instead of 16/40) one might think of ἡμ(ιολί)ου(ς) (scil. γόμους). Whatever the solution of the abbreviation may be, it probably refers to a term of the same category as γόμος, μανδάκη, φορτίον, ἀγώγιον etc.

4. χρ/ : χ(ω)ρ(ίου)?

7. Ἰακῶβ : he probably belonged to the *stablitai* of the domain. Quite a few stablemen bear Jewish names : Abraam, Isakios, Elias, Iakob.

8. πιττακ(ίων) either refers to the accounts that were the basis of the author's information (cf. p. 38), or to the general account, drawn

up by the author (1). In the first case *διαγραφή* would mean « transcript, list », in the second « redaction ». The first solution is to be preferred, because **II 22** did not constitute the end of the author's accountancy, cf. our commentary on **II 23**.

II 23

] . . ς
] . . . ι
] — — —

II 24

λό(γος) τῶ(ν) ἀπο( )
Ταλὶ (ὑπὲρ) τροφ(ῆς) βοῶ(ν)
. . . . θ( )

II 23 Only a few letters of this account have survived. They belong to the right extremity of a column which started very probably (cf. **II 22**) at a distance of 2,5 cm. from the left edge of section 2 and extended over 7,5 cm. It probably covered a considerable part of the lower half of section 2-1.

In our opinion this account gave a summary of the expenses that had been recorded on sheet II. It is less likely to have summarized the expenses recorded on both sheets.

II 24 1. $\overset{o}{\grave{\alpha}\pi}$ *Ταλί* : This is the only case in which $\overset{o}{\grave{\alpha}\pi}$ cannot be interpreted as a preposition. The abbreviation probably has the same meaning as $\overset{o}{\grave{\alpha}\pi\sigma\tau}$( ) (**I 1**, 8 and **II 8**, 3), $\overset{\sigma}{\grave{\alpha}\pi}$ (**II 1**, 13), $\overset{o}{\grave{\alpha}\pi\sigma\tau\lambda}$ (**II 2**, 17) $\overset{o\ o}{\grave{\alpha}\pi\sigma\tau}$ (**II 7**, 2). Only the two initials lines of this account, and traces of its third line have been preserved. The third line may have contained a specification of the *βόες* in question.

II 24 obviously intends to repair an omission. The account probably dealt with the second and third troop of *βόες*, whose maintenance during year 8 had been the subject of a lost account in section 8 verso (dealing with Pharmouthi-Payni) and of **II 16** (dealing with Phaophi-Hathyr). **II 24** may have given a survey of the provisions that had been received on account of year 9, a subject which the author should normally have treated in connection with his accountancy of the animals' maintenance during Pharmouthi-Payni.

(1) In *P. Oxy.* 297 (54 A. D.) *πιττάκια* means : account-book.

CONCLUSION

The most interesting features of *P. Iand.* 653 are undoubtedly the following : first of all, its data about stall-feeding and more particularily its abundant details on daily rations of hay, a subject on which Greek papyri had yielded, up to now, very little information : in the second place its provenance from the accountancy-office of an estate which was connected with sister-domains, scattered all over the Division of Polemon, and its information about the cooperation between these domains (exchange of agricultural products and of animals) ; finally its methods of accountancy, revealing a certain decline in the professional training of clerks.

INDICES

1. Indictions and Months

α ἰνδικτίων (ινδ/) : II 1, 16.
ζ ἰνδικτίων (ινδ/) : I 1, 6 ; II 9, 17.
η ἰνδικτίων (ινδ/) : I 1, 2 ; II 2, 1 ; II 7, 3 ; II 8, 1 ; II 9, 1 ; II 15, 2 ; II 19, 1.
Θώθ : 8th year : II 6, 1 ; II 19, 2.
Φαῶφι (φαωφ/) : 8th year : II 6, 3 & 8 ; II 6, 4 ; II 16, 2 ; II 19, 2 ; 9th year : II 9, 22.
῾Αθύρ (αθυρ/) : 8th year : II 16, 3 & 5 ; II 19, 3.
Χοίακ : 8th year : II 1, 7.
Φαμενώθ : 8th year : II 1, 2.
Φαρμοῦθι (φαρμ/, φαρμουθ/) : 7th year : I 6, 1 ; 8th year : II 2, 2 ; II 10, 1 & 5 ; II 14, 1 ; II 18, 3 ; II 19, 5 ; II 21, 3.
Παχών : 8th year : II 9, 3 ; II 10, 3 ; II 14, 1.
Παῦνι (παυνι, παυν/) : 7th year : I 1, 11 ; I 6, 3 ; 8th year : II 9, 4 ; II 18, 3 ; II 19, 5 ; II 21, 4.
᾽Επίφ (επιφ/) : 8th year : I 2, 4 & 5 ; I 6, 2 ; II 1, 5 & 11 ; 9th year : II 9, 7 ; II 10, 6 ; II 18, 4 5.
Μεσορή (μεσορη, μεσορ/) : 8th year : I 2, 2, 3, 8 & 9 ; II 1, 6 ; 9th year : II 9, 10 ; II 18, 6 ; II 22, 2 & 5.

2. Personal Names

᾽Αάνις : II 1, 9.
᾽Αβραάμ : II 5, 2 ; II 9, 16 & 23 ; II 11, 2.
᾽Αμόθες : II 1, 14.
῞Ασινος : II 7, 4 & 5 ; II 8, 5.
Βίκτωρ : II 2, 13.
᾽Ηλίας : II 5, 5 ; II 6, 5 ; II 8, 5 ; II 20, 10.
᾽Ιακῶβ : II 22, 7.
᾽Ιουλιανός : II 1, 11 & 13.
᾽Ισάκιος (ισακιος, ισακι/) : II 1, 15 ; II 7, 1 ; II 9, 14.
Μαειουρᾶς : II 1, 1.
Μηνᾶς : I 1, 3 ; II 1, 5 & 12 ; II 5, 4 ; II 9, 14, 18 & 21 ; II 11, 5 ; II 21, 16.
Μο[—] : II 21, 15.
Πακένιος (πακ/, πακενι/) ; I 1, 9 ; II 8, 1 ; II 20, 5.
Παπνούθιος (παπνουθ/) : I 2, 1.
Πετῶς : II 1, 1.
Σερῆνος : II 5, 3 ; II 11, 3.
Τησνοῦβις : II 20, 14, 16 & 19.
Φαναμιεῦς (φαναμ/) : II 2, 8 & 9 ; II 20, 1.
Φίβ : II 2, 1 ; II 20, 2, 6, 9, 11, 13 & 20 ; II 21, 11 ; II 22, 3.
Φοιβάμμων (φοιβαμμ/) : II 8, 2 ; II 9, 12 ; II 11, 4.

3. Geographical

Βούσηρις (*βουσηρ/*) : II 9, 8, 9, 10, 11, 13 & 15 ; II 10, 6 ; II 12, 5 ; II 18, 7 ; II 20, 12, 15 & 17 ; II 22, 5 & 6.
Θανεκώς (*θανεκ/*) : II 20, 8.
Κέκ : I 1, 7.
Κῦσις : II 12, 3.
Μαντ( ) : II 3, 1, 2 & 3.
Μοῦχις (*μουχ/*) : I 1, 12 ; I 6, 7 ; II 9, 7, 12 & 16.
Σκελαῖος (*σκελαι/*) : I 1, 1 ; II 5, 1 ; II 11, 1.
Ταλί : I 6, 8 & 12 ; II 12, 4 ; II 24, 2.
Τὸ Σκέλος : I 6, 7 ; II 9, 6 ; II 12, 2.
Τοῦ Μελίτωνος (*το/ μελ/, τ/ μελιτ/*) : II 9, 19 & 20 ; II 20, 18.

4. Symbols

ϟ = *καί* : *passim.*
Ø = *ὁμοῦ* : II 2, 15 & 16 ; II 7, 4 ; II 11, 6 ; II 14, 6 ; II 16, 7 ; II 19 4 & 8 ; II 20, 22.
ϟ = *ὑπέρ* : *passim.*
ζζ/ = *ὑποζύγιον ζῷον* : II 1, 2, 7 & 8 ; II 2, 10 ; II 9, 2.
† = II 1, 1 ; II 2, 1 ; II 9, 1 ; II 10, 2 ; II 21, 1.

5. Measures and Weights

ἀγκάλη (*αγκ/*) II 6, 2 ; II 9, 2 & 5 ; II 10, 4 & 9 ; II 13, 1 & 3 ; II 14, 2 ; II 16, 4 & 6 ; II 17, 1 ; II 18, 1 & 2 ; II 19, 4, 6 & 7 ; II 21, 2 & 6 ; II 22, 2. Cf. p. 10, n. 1.
γόμος (*γ/, γομ/*) : I 1, 3, 4, 5, 6, 8, 10 & 12 ; I 2, 1, 2, 3, 4, 5, 6, 8, 9 ; I 4, 3 & 4 ; I 6, 7, 8 & 9 ; II 1, 1, 2, 3, 10 ; II 2, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 & 16 ; II 5, 2 & 3 ; II 6, 2 ; II 7, 2, 3, 4 & 6 ; II 8, 3, 4, & 5 ; II 9, 3 & 5 ; II 10, 3, 6 & 7 ; II 11, 2, 3 & 4 ; II 13, 1, 2, 3, 4 ; II 14, 4, 5 & 6 ; II 15, 3 & 4 ; II 16, 1, 4, 6, 7 ; II 17, 1, 2 ; II 18, 5, 6 & 7 ; II 19, 3, 4, 6 & 10 ; II 20, 2-19, 22 ; II 21, 6, 7, 10, 12, 13 & 17 ; II 22, 1, 2, 4, 5, 6, 7.
εἰκοσάγκαλος (*κ αγκ/*) : II 2, 6, 8, 11.
ημ( )*ου*( ) : II 22, 2.
κοῦρι (*κουρ/*) : II 15, 4.
μούειον (*μ/, μο/*) : II 2, 14 ; II 11, 6 ; II 12, 1, 2, 3, 4 & 5 ; II 19, 8 & 11.

6. General Index of Words

ἀγορά : I 1, 7.
ἀγοράζω (*ηγορασθ/*) : II 9, 4.
ἀγοραστός (*αγορ/, αγοραστ/*) : I 1, 2 & 11 ; II 3, 2.

ἀνάλωμα (αν/, αναλωμ/, αναλωματ/) : I 4, 2 ; II 15, 1 & 2.
απα( ) : II 9, 14.
ἀπό (απ̂) : *passim*, cf. note on I 1, 7.
ἀπο( ) : II 24, 1.
ἀποθνήσκω (απεθ/, απεθανεν) : II 16, 8 ; II 19, 10.
απ(ο)σ( ) : II 1, 13.
αποστ( ) : I 1, 8 ; II 8, 3.
αποστο( ) : II 7, 2.
ἀποστολή (αποστολ/) : II 2, 17.
αὐτός (αὐτῆς, αυτ/, αυ/) : I 2, 4 ; II 2, 6 ; II 14, 4 ; II 20, 3, 4 & 6 ; II 21, 9 ; II 22, 4.
ἄχυρον (αχ/) : II 15, 3.

βουείδιον (βουειδ/) : II 19, 9.
βοῦς (βοων, βοω/) : II 5, 1 ; II 6, 1 ; II 11, 1 ; II 16, 2 & 8 ; II 24, 2.

γεουχικός (γεου/, γεουχ/) : I 1, 9 ; II 2, 10.
γεωργός (γεοργ/) : II 21, 11.
γρα( ) : I 1, 9.
γραμματικόν (γραμμ/) : I 2, 1.

διά (δι/) : II 1, 3 ; II 2, 10.
διαγραφή (διαγρ/) : II 22, 8.

ει( ) : II 19, 9.
εἰς : II 6, 1 ; II 8, 4 ; II 10, 4 ; II 12, 2, 3, 4 & 5.
ελθ( ) : II 6, 1 & 3.
ἐξ : I 4, 2.
εξ( ) : I 6, 10 ; II 2, 17 ; II 6, 6 ; II 12, 2.
επικ( ) : II 21, 16.
εριταριου : II 4, 1.
ἔχω : I 6, 9 ; II 9, 5 & 14 ; II 10, 2 & 7 ; II 18, 4 ; II 21, 8 & 15.
ἕως : *passim*.

ζῷον (ζ/) : I 1, 1 ; II 7, 4 & 5 ; II 9, 4 & 16 ; II 14, 2 ; II 20, 9 & 12.

ἡμέρα (ημ/, ημερ/) : II 9, 3 ; II 13, 1 ; II 16, 1, 3 & 5 ; II 21, 5.
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ἡμέτερος (ημ/) : II 1, 2, 7 & 8.

ἱππάριον (ιππαρ/) : II 1, 4 ; II 2, 11.

καθ( ) : II 7, 2 & 6.
κάμηλος (καμ/) : I 2, 5.

λαμβάνω : II 10, 5 ; II 14, 6 ; II 18, 5.
λόγος (λο/) : I 2, 1 ; II 2, 1 ; II 7, 1 ; II 11, 1 ; II 15, 2 ; II 24, 1.
λοιπόν (λ/) : I 1, 5 ; I 6, 9 ; II 6, 2 ; II 10. 7 ; II 14, 6 ; II 16, 8 ; II 19, 11 ; II 21, 13.

μήν (μη/) : II 14, 5 ; II 18, 5.
μικ( ) : II 3, 2.
μουλάριον (μουλ/, μουλαρ/) : II 2, 7 ; II 18, 1 & 2.

ὁ, ἡ, τό : *passim*.
οι[—] : II 10, 1.
ὁμοίως (ομ/) : II 2, 14 ; II 22, 4.
ὀνηλάτης (ονηλατ/) : I 1, 4 ; I 2, 3, 6 & 8 ; II 1, 3 & 6 ; II 9, 1.

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πι( ) : II 1, 13.
πιπράσκω (επραθ/) : II 3, 1.
πιττάκιον (πιττακ/) : II 22, 8.
πληρο(φορέω ?) : II 18, 6.
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σταυλίτης (σταυλιτ/) : II 7, 1 ; II 9, 12 ; II 10, 2.

σφυρίς (*σφ/*) : II 4, 1.

ταῦρος (*ταυρ/*) : I 6, 1 ; II 1, 5 & 12 ; II 2, 5 ; II 3, 1 ; II 21, 1.
τελειόω (*ετελ/*) : II 22, 8.
τιμῆ (*τιμ/*) : II 15, 3 & 4.
τροφή (*τροφ/*) : I 1, 1 & 4 ; I 2, 3 ; II 1, 2, 4, 6, 7, 8, 12 ; II 5, 1 ; II 6, 2 ; II 9, 1, 2 & 14 ; II 11, 1 ; II 14, 3 ; II 20, 1 ; II 21, 1 & 14 ; II 24, 2.

υἱός : II 1, 10 ; II 7, 4 & 5.

χορτα( ) : II 9, 18 & 21 ; II 20, 23.
χορτικός (*χορτ/*) : II 11, 1.
χόρτος (*χ/*, *χορτ/*) : I 1, 2 & 6 ; II 2, 1 ; II 8, 1 ; II 9, 17 ; II 15, 3 & 4 ; II 21, 13.
χρ( ) : II 22, 4.

ὠνέομαι (*εωνημ/*) : II 8, 4.
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