VII.—The Dovecotes of Karanis

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The study of the granaries of Karanis presented last year at the annual meeting of the American Philological Association[1] was the first of a projected series in which it is planned to correlate the archaeological evidence from the excavations of the University of Michigan at that site with the written evidence from the papyri of Graeco-Roman Egypt. Since nowhere else has such exhaustive work been carried on at the site of an Egyptian village of this period, it is to be hoped that the archaeological findings may illuminate some of the doubtful papyrus passages, and that the papyri may sometimes provide answers to questions raised by the excavations.

The importance of grain in the economy of Egypt made it natural that the granaries for its storage should be a prominent feature of the Egyptian village. Although not of comparable importance economically and of relative insignificance from the administrative point of view, the raising of pigeons, both for food and for the production of manure, was widespread in ancient Egypt, as it is in Egypt today, and the dovecotes at Karanis were both large and numerous.

The remains of the pigeon houses probably do not indicate the actual number that were in use. Since the common practice was to build the dovecotes in the upper story of a house or tower, they would naturally be the first part of the house to fall to ruin. Yet there still remain five extensive dovecotes and part of a sixth, from which we can learn the details of their structure. Two of these, B9 from the second level of excavation and C37 from the third, were briefly described in the published report of the excavations.[2] An-

[1] *TAPA* 83 (1952) 56–73. As in the study of the granaries, the writer wishes to acknowledge the debt she owes to the Director of the F. W. Kelsey Museum of Archaeology at the University of Michigan, Dr. E. E. Peterson. Not only has he made available all the unpublished records and maps of the excavations, but he has freely shared his wide personal knowledge of the matters under discussion.

[2] E. E. Peterson and A. E. R. Boak, *Karanis, Topographical and Architectural Report of the Excavations during the Seasons 1924-28* (Ann Arbor 1931) 24, 48–49, and plates XV, fig. 30, XVI, fig. 31, XXXII, fig. 64. The reader is referred to pp. 6–7 of this report also for an explanation of the various levels of occupation disclosed by the excavations, and of the numbers assigned to the buildings uncovered.

other, which was constructed in the forecourt of the large granary C65, was mentioned in the same report,[3] but had not at that time been fully excavated. One of the largest, and one of the most interesting of the pigeon houses was D301, which was probably built in the first century B.C., since it is in the fourth level of occupation. It continued in use, however, into the second level. Still another pigeon house, C91, comes from the third level, and a few scanty remains of another were found in the top level, which in general appears to have been occupied in the fourth and fifth centuries.

The two largest dovecotes are C37 (to which probably the rooms designated C35 also belong) and D301. From their size and the number of nesting places provided for the pigeons it is certain that they were establishments either operated commercially or carried on as an adjunct to a large estate or farm holding.

C35 and C37 comprise a complex of rooms, corridors, and courtyards surrounding three massive towers in which the pigeons were housed. The overall dimensions of the building were 14.5 by 11.75 meters, and the towers, although irregular in construction, were roughly 4.5 meters square at the base. The walls were built of sun-dried brick, with a slight batter, and were approximately 1–1.5 meters thick at the base and from .75–1 meter thick at the top. The basement of each tower was used for storage, and in two of them this space was divided into bins for grain such as we find in the large granaries. These semi-underground storage rooms were covered with vaulted ceilings about 2.5 meters high. Since the tops of the towers have fallen to ruin, it is not possible to determine their original height, or to state from positive evidence whether or not they were roofed. It is safe, however, to assume that they were left unroofed to allow the entrance and egress of the pigeons, since in all the structures the nests face the inside of the tower.

Within the tower the walls are lined with pots set horizontally in the masonry with the mouth serving as the entrance and the body of the pot as the nesting place. The pots were of special construction, usually 45 cm. in height and 25 cm. across the largest part of the body, with a round mouth about 15 cm. in diameter. They were made on the wheel, and the small opening at the bottom of the pot, where it rested on the peg of the wheel, was not closed, since

[3] Peterson and Boak (above, note 2) 54 and plate XXXIII, fig. 65.

this was unnecessary for the purpose for which it was to be used. The edge of the hole was sometimes reinforced by an added ridge of clay. Many of these pots were found both *in situ* and elsewhere throughout the excavations.[4]

Beneath the rows of pots were either two or three rows of small rectangular niches, 20 cm. deep and having an opening 15 cm. square. These niches were a regular feature of all the large dovecotes and their purpose is uncertain. The most reasonable assumption seems to be that they were used for nests for the squabs and young pigeons before they reached breeding age. The earliest age at which the squabs would be ready for the market would be from three to four weeks.[5] If, as Aelian states (*Var. Hist.* 1.15), the Egyptian pigeons produced twelve broods a year, the squabs would be barely two weeks old when the new brood hatched. Moreover the parent birds are said to expel the young birds from the nest when the pigeon "milk" begins to form for the next brood, which occurs several days before the eggs are hatched. It is clear, therefore, that the young pigeons would have to be fed for at least a week before they would be large enough to be sold for food. Even if the pigeons did not breed as prolifically as Aelian believes, the squabs were probably kept till they were older and were specially fed to fatten them for the market. Cato (*De agri cultura* 90) gives formulas to be used in the "cramming" of pigeons, and Varro (*Res rusticae* 3.7.9–10) and Columella (*De re rustica* 8.8) both give directions for the fattening of squabs to increase their purchase price. The papyri offer no evidence on the fattening of pigeons, but they do show that other fowl were so treated.[6] The rectangular niches would be a convenient place to keep the birds that were to be specially fed, since they were low and open and hence more accessible than the deep, narrow-necked nesting pots.

The suggestion that the niches were used as a place to strew food for the pigeons is scarcely tenable, since they are too small and too deep for the purpose. Varro says that the pigeons' food should be placed in troughs running around the walls; and, according to

[4] A group of some two dozen such pots were found in the lowest level only a short distance from a pottery kiln.

[5] Information on pigeons and pigeon breeding as practiced today can be obtained from many modern handbooks on the subject. The statements made here are based on Alice Macleod, *Pigeon Raising* (New York 1913).

[6] Cf. for example *PMich.* 1.48 (251 B.C.), in which Apollonius instructs Zenon to send him 400 fowls and 100 hens for fattening.

Columella, it may be simply scattered along the walls, the only place where it would not be contaminated with dung. Nothing remains in the Karanis dovecotes to suggest how the pigeons were fed and watered, and, if special vessels were provided for the purpose, they have completely disappeared.

At a rough estimate there were at least 1000 nesting places in the part of C37 that remains standing, and it is not unlikely that the total number was 1500, or even more, depending on the original height of the towers. It is obvious that an establishment of this size was a commercial enterprise, since it was much too extensive for the needs of a single family or even group of families.

The remainder of the house contained courtyards and rooms used either as offices or as living quarters for the owners. Additional storage space for grain was provided in underground vaults at the southern end of the building. The ground on which the house was erected sloped down on the north, and a door on this level opened on the street that ran along the northern side. There are some indications that the building, aside from the towers, originally had only one story. A stairway from the underground floor appears to have been a later addition, and there is some evidence that suggests that the second floor had also either been built on at a later date or undergone extensive reconstruction. Another pigeon loft was built against the northern wall of the northwest dovecote with additional nesting places on the north and west, and this too appears to have been added to the earlier structure.

The two dovecotes, C91 and C65, are similar in their plan and arrangement to C37, although neither is so extensive. C91 was probably built in the early second century, but continued to be used for the raising of pigeons after alterations made in the early third century. The house itself, 12.5 meters long and 10.8 meters wide, with an ell extension on the northeast corner measuring 3.5 by 7 meters, consisted of a series of one-story rooms and courtyards surrounding a central three-story tower that housed the dovecote. The tower was the same size as those in C37, 4.5 meters square at its base. The underground floor was used as a storage vault for grain, with the usual division into bins. The arrangement of nesting pots and square niches is the same as in C37.

The dovecote which was built in the forecourt of the large granary C65 was similar in construction to C37 and C91, but, instead of being a square tower, surrounded by other rooms of the

building, it was an independent rectangular structure, 7.5 by 2.5 meters in size. The lower floor was made up of two vaulted storage rooms, each divided into bins. The second floor, in which the pigeon nests were built, was divided into two parts by a wall, .5 meter thick, in which there was a doorway, 1.75 meters high and a little over .5 meter wide. The lintel was made of branches covered with mud brick and plaster, and a large branch was also set in across the doorway, .5 meter below the lintel. Inset in the walls of the two rooms, and in the doorway as well, were the rows of nesting pots. Six rows of pots remain, either in whole or in part, and the total number could not have been less than 300. It is not unlikely that the tower originally extended considerably higher and that the number of nesting places was correspondingly greater. The additional strength provided by the cross wall would have served to brace the long and otherwise unsupported side walls.

The only entrance to this dovecote was a door at the southern end, nearly three meters above ground level. No stairs led to the door, so it is apparent that access could have only been by means of a ladder. Where the dovecote tower formed an integral part of the building, access might have been from a second-story room.

Nothing further need be added to the published description of the dovecote in house B9, which followed the pattern of C37, C65, and C91. D301, however, is a more elaborate structure that deserves special discussion. As stated above it dates from the fourth level of occupation, probably first century B.C. It was an independent building, with the nests built down to ground level, and there was no basement storage room beneath the pigeon house proper.

The building was in the form of a square, 9.7 meters on each side. The mud brick walls were no less than 1.5 meters thick. Entrance was through a door on the south into a corridor 7.5 meters long and almost a meter wide. Opening from this central corridor and at right angles to it were three transverse corridors extending almost three meters to each side. On the north side of the north transverse corridor were three niches, .5 meter deep, extending to floor level, and there was a corresponding arrangement on the south wall of the southern corridor, although here the middle niche was in part taken up by the entrance passage.

The upper part of this dovecote was destroyed when house C401 was built above it, and it is impossible to estimate its original size

with accuracy. Judging by the arrangement of the other pigeon houses, we may be sure that at least 1250 nesting places were provided, and close to 200 of the small square niches.

A few traces of a dovecote appeared in the A level, that of the latest occupation in the fourth or fifth century. The fragmentary remains of three walls disclose the same square structure, with nesting pots embedded in the walls and opening toward the inside.

Several ancient Roman writers on agriculture have dealt with the subject of pigeon breeding, and have given us a reasonably complete picture of the methods employed in Italy during the early centuries of our era. Varro, who wrote his *Res rusticae* about 30 B.C., and Columella, whose *De re rustica* dates from the first century of the Christian era, have been cited above.[7] Palladius, who composed a similar work in the fourth century, adds little to the earlier accounts. The *peristeron* as described by Varro is a large building with a vaulted roof. It has one door and either "Punic" windows, which we may assume from Palladius (*De re rustica* 1.24) were small and narrow, or wider windows covered with lattice work to exclude birds of prey. The walls are smoothly plastered, so that lizards and mice cannot get in. Round nests are provided for each pair of pigeons, and they are set side by side in rows running up to the vaulted roof. Each nest has an opening just large enough to allow the entrance and exit of a single pigeon, but the interior measures three palms (ca. 22 cm.) in all directions. Before each row a board, two palms wide, is fixed to serve as an entrance to the nests and to provide a place for the pigeons to walk. To this description of a properly constructed dovecote Columella adds little, although he does mention the use of pottery nests, *fictilia columbaria*. He also specifies that the walls of the dovecote and the nests themselves should be whitewashed, because, as he says, *eo colore praecipue delectatur hoc genus avium*. Both Columella and Palladius state that the pigeon house should be in a tower or elevated place.

The dovecotes at Karanis follow closely the precepts of Varro and his successors, and such differences as may be noted are due to the difference in climatic conditions between Italy and Egypt. In Egypt, where protection from the weather was a negligible factor, the top of the dovecote could be left unroofed. As a result the windows, which were designed to give the birds entrance and also to provide sunlight and ventilation, could be and were dispensed

[7] See above, 83.

with. The *fictilia columbaria* of Columella are the pottery jars set in the dovecote walls for nests, and they meet the specifications of Varro in that they have narrow mouths but a body approximately 25 cm. in diameter. The walls and the rectangular niches are plastered with the usual yellowish brown mud plaster, so common in the buildings of Karanis, but there is no trace of whitewash. Perhaps the Egyptian pigeons, unlike those in Italy, were not partial to white. The boards to be used as walk-ways for the birds are lacking. That such boards would have disappeared in the course of centuries might perhaps be expected, since wood was scarce in Egypt and not a great deal remains that is not a structural part of the buildings. Nevertheless it should be noted that there is no indication that such walk-ways were provided, and no remaining evidence that anything was attached to the walls below the rows of nesting pots.

The papyrus evidence regarding the raising of pigeons in Egypt was briefly discussed by Schnebel,[8] and was subsequently more fully examined by Maria Cobianchi.[9] The evidence regarding the pigeon houses was also treated by Luckhard.[10] It is not necessary here to go into this evidence in detail, but only to point out how it fits in with the actual construction of the dovecotes as we find them at Karanis.

The dovecotes were often situated in an outlying farmstead, where they either occupied part of some outbuilding, or stood alone, frequently adjacent to a vineyard or garden. The latter was a convenient location, since pigeon dung was largely used to fertilize land used for these purposes.[11] The construction of the dovecotes was no doubt the same whether they were built in the villages or outside, but a self-contained building like D301 would probably be the type used when the pigeon house was built at a distance from the other farm buildings. But it is not surprising that we should find many pigeon houses in the villages. Except where there were large farm holdings with many buildings and large households, the owners and farmers of the land probably lived in the villages, going out by day

[8] M. Schnebel, *Die Landwirtschaft im hellenistischen Ägypten* (*Münchener Beiträge z. Papyrusforschung u. antiken Rechtsgeschichte* 7 [1925]) 341–42.

[9] Maria Cobianchi, "Ricerche di ornitologia nei papiri dell' Egitto greco-romano," *Aegyptus* 16 (1936) 91–147.

[10] F. Luckhard, *Das Privathaus im ptolemäischen und römischen Ägypten* (Giessen 1914) 99.

[11] Schnebel (above, note 8) 85–86.

to cultivate their fields in the adjacent country-side and returning to their homes at night. Their property would receive greater protection within the confines of the village, and it may be for this reason that we find granaries, dovecotes, and animal pens in such numbers in Karanis.

There is some indication in the papyri as to the size of the dovecotes. In *PTebt.* 1.62, which is a list of owners of temple and cleruchic land of the second century B.C., an area of one aroura is recorded in line 49, in which 19/32 were taken up by a shrine to Isis, 12/32 by a garden, and 1/32 by a pigeon house. The pigeon house therefore occupied an area of slightly over 86 square meters, and would be comparable in size to D301, which was 9.7 meters square and covered a little more than 94 square meters. Another of the many documents dealing with the land survey in Ptolemaic Egypt published in the first volume of Tebtunis papyri, *PTebt.* 1.86.15, lists a dovecote occupying the same amount of space. Still another entry, in a register of cleruchs of ca. 148 B.C., *PTebt.* 1.79.71, designates a dovecote of twice that size, 1/16 of an aroura. The entire building C35 and C37, with its three towers and adjacent rooms and courtyards, occupied over 170 square meters, or almost 1/16 of an aroura (172.25 square meters).

Only one document mentions the nesting pots in the dovecotes. It is *PTebt.* 1.84, part of the land survey of Kerkeosiris made in 118 B.C. In lines 8–10 property is listed which includes dovecotes with 1000 pots (ἀγγεῖα). The number of dovecotes is not given, but we have noted that the individual towers in C37 and C91 probably contained from 300 to 400 nests, and we might deduce therefore that this property in Kerkeosiris contained three such dovecote towers.

The rentals stipulated in leases of pigeon houses are frequently to be paid in part in young pigeons,[12] and, if we had any knowledge of the percentage of the total flock that this payment represented, we would have some basis for computing the size of the dovecotes that housed them. In no lease, however, do we have any information given with regard to the size of the dovecote or the number of pigeons that were included in the transaction.

The construction of the pigeon house required the services of a professional builder. In *PGrenf.* 1.21 (Mitteis 2.302), a will of the year 126 B.C., a half-finished dovecote is included in the property of

[12] Cobianchi (above, note 9) 115–19.

the testator, and the heirs, a son and five daughters, are required to share equally in the expense of a builder who is to be hired to complete it. A papyrus of the Byzantine period, *BGU* 3.962, is an order to an oil dealer to pay six *xestai* of oil to the carpenter and sawyers engaged on the building of a dovecote; the employment of woodworkers would seem to indicate a type of construction different from that in Karanis, where the use of wood was minimal.

Another document throws an interesting sidelight on the dovecotes and fits in neatly with the archaeological evidence. It was noted above[13] that there are no stairs leading to the second-story dovecote associated with the granary C65, and that a ladder would have been necessary for anyone to enter it to tend the pigeons or to clean out the manure. *POxy.* 8.1127 (A.D. 183) is the lease of an upper room in which there is a dovecote described in the following terms: *τὸν ὑπερῷον τόπον τῆς ὑπαρχούσης αὐτῷ ἐν* Μουχινὺρ *οἰκίας καὶ ὃν ἔχει ἐκεῖ περιστερεῶνα σὺν τῇ τούτου κλείμακι ξυλίνῃ.* Such a ladder would not only be used to enter the dovecote, but would also serve to reach the higher nests, if the young pigeons were to be removed to the lower nests for special feeding and fattening after a subsequent brood was hatched.

The same document also stipulates that at the termination of the lease the lessee is to return the pigeon house in the condition in which he received it, with the two doors and one key. Although generally the doors of the dovecotes in Karanis have disappeared, there is little doubt that they once had them, and that the doors could be locked. A small opening at the base of the dovecote tower in the courtyard of house B9[14] was closed by a wooden door, which remained in its original position. The size of the opening and its location make it probable that it was used for the removal of the manure from the bottom of the dovecote.

A third century document from Oxyrhynchus, *PFlor.* 1.10, is a lease of two dovecotes and a *κέλλα*. The *κέλλα* is probably a storeroom, such as we find in connection with most of the Karanis dovecotes, and it would most naturally be used to store feed for the pigeons.

In view of the number and size of the Karanis dovecotes, it is perhaps surprising that few papyri found during the excavations mention either pigeons or pigeon houses, and that of those found

[13] See above, 85.

[14] See above, 81 and note 2.

none can be associated with the actual structures. P. Mich. Inv. 2933, an unpublished property declaration dated 53 A.D., reports the ownership of an *οἰκία καὶ αὐλὴ καὶ ἐλαιουργῖ[ον] καὶ περιστερεών*. Another unpublished document, P. Mich. Inv. 2915, dated in a year of Domitian, is a fragmentary contract for the division among a brother and two sisters of several pieces of inherited property, including a *θησαυρὸν καὶ περιστερεῶνα*. One of the sisters is a Minucia Thermoutharion, the mother of the Valeria Diodora who, in *PMich.* 6.428 (154 A.D.), sells to Gaius Julius Niger a house which stands to the north of a dovecote which she also owns. These three documents all come from an area on the northwest of the excavations where no dovecotes were found.

The Karanis tax rolls[15] supply some additional information regarding the raising of pigeons in that area in the records of the payments of the dovecote tax, *τρίτη περιστερεῶνος*. Four persons pay this tax in the register of the twelfth year of Marcus Aurelius Antoninus, one of whom also makes a payment in the thirteenth year. Eight other persons are listed as paying the tax in the thirteenth year, and one payment is recorded in the fourteenth year.

Aside from the pigeon houses excavated at Karanis we have one other bit of archaeological evidence on the construction of the dovecotes in Egypt. This is the frequently cited Palestrina mosaic,[16] which depicts scenes along the Nile. The dovecote shown in the mosaic differs considerably from those at Karanis. It is a circular tower, surmounted by a conical dome in which the nests are placed in rows opening to the outside. Around the top of the tower beneath the dome branches have been inserted to provide a place for the pigeons to light before entering the nests.

Although there are variations in details of construction, the dovecote in Egypt today remains essentially what it was 2000 years ago.[17] It may either occupy a separate building, more or less towerlike in form, or be built in an upper story of a house or out-

[15] H. C. Youtie, V. B. Schuman, O. M. Pearl, *Tax Rolls from Karanis* (*PMich.* 4, Parts 1–2) Ann Arbor, 1936–39. For a list of the payments of the dovecote tax, see Part 2, 136–37.

[16] This section of the mosaic is reproduced by M. Rostovtseff in his *Social and Economic History of the Roman Empire* (Oxford 1926) on Plate XLI. See also his article "Hellenistische-römische Architekturlandschaft," *RM* 26 (1911) 60.

[17] Descriptions and pictures of modern Egyptian dovecotes may be found in J. Lozach and G. Hug, *L'habitat rural en Égypte* (Caire 1930) 151–55 and plates XIX–XXI.

building, frequently a granary. The nests are still made of clay pots set in the masonry. Branches are generally embedded in the outer walls to provide roosting places for the birds, a feature that appears to be lacking in the dovecotes of Karanis, but which is present in the representation on the Palestrina mosaic. The nesting pots open either to the outside or to the inside of the structure, and again, although the nests in all the pigeon houses in Karanis open to the inside, the mosaic shows that both types were used in ancient Egypt. These modern pigeon houses, when compared with those at Karanis, give clear evidence of the continuity of the basic types of Egyptian living from remotest times to the present.