

VRG — Folder — 0018

On Graecias

See "Middle St. Dated" (Hesp 1985), pp 26-27,
with refs.

See now further on graecias in Margantim,
AJA 1988, pp 315-6, 321-4, 325 (Malcolm Bell).
Pp. have been photocopied, was in folder for "Middle
St. Dated: suppl."

(Note that the USSR is now
importing grain from the US
when able.)

MODERN RUSSIAN GRAIN - CARRYING
SHIP
— Black Sea S.D. 86

On Sept. 1st

" grain - carrying cargo
ship ^{18,000} Pyotr Vesel named

Soviet transport line
 Admiral ^{17,000+} Nebukhodonosor

which had just left
Black Sea Port Novorossiysk

(Pyotr V. must have been
coasting.)

GRANARIES, etc.

Note a new article, in Hesperia 36, 1987, pp. 335-353, on "The Roman Watermill in the Athenian Agora - A New View of the Evidence." by Robert J. Spain ("Imperial College of Science and Technology, London")
Admission for Arthur's article. Sees evidence for different workings of water control.

Nothing on history of mills (in Athens or elsewhere) but some further bibliography, Peter the Author

GRANARIES - MILLS

See Owen Raverot's text and drawings here and there in Period Piece. Form of buildings, access, either for loads from boatloads or for carts pulled by four-shire horses:

Hoisting of full bags, and how they push up the horizontal doors ^{in the upper floor}, and let them drop again. Square

openings in one ^{floor} ~~space~~ above another, four? floors.

Great storage space - ^{part of which is} later converted into a viewing-place over the tennis court, but it was not used much

(north, cold). I guess, nothing said about the grinding; but the bldg is ~~now~~ called a mill.

I 7557

Grain to be stored in the Aikation

12, XI, 87

John Camp bought

found in BT, summer 1987(?)

[5.01]

TL 5000 copy 3

Σ 200x

Γ Ο Ε Ο Ι

374/3

Ε Π Ι Σ Τ Ο Λ Η Κ Ρ Α Τ Ι Δ Ο Α Ρ Χ Ο Ν Τ Ο Σ

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Τ Ω Ν Ν Η Σ Ω Ν

vacant

5

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45

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Λ Η Ν Τ Ω Ν Π Υ Ρ Ω Ν Κ Α Ι Τ Ω Ν Κ Ρ Ι Θ Ω Ν Ο Π Ο Σ Ο Υ Χ Τ

ΗΓΩ ΛΕΝΤΟΥΣ ΑΙΡΕΘΕΝΤΑΣ ΤΟΝ ΔΕ ΞΙΤΟΝ [O]
 ΙΠΡΙΑΜΕΝΟΙ ΤΗΝ ΔΩΔΕΚΑΤΗΝ ΚΟΜΙΣΑΝΤ [O]
 Ν ΠΡΟΤΟΥΜΑΙΜΑΚΤΗΡΙΩΝ ΟΣΜΗΝΟΣΟΙ ΔΕ Α
 ΙΡΕΘΕΝΤΕΣ ΥΠΟ ΤΟΥ ΔΗΜΟΥ ΕΠΙΜΕΛΟΥΣΘΩ
 50 ΝΟ ΠΩΣ ΑΝ ΚΟΜΙΗΤΑΙ ΟΣΙΤΟΣ ΕΝΤΩΙΧΡΟΝ
 ΩΙΤΩΙ ΕΙΡΗΜΕΝΩΙ ΕΠΕΙ ΔΑΝ ΔΕ ΑΠΟ ΔΩΝΤ [O]
 ΖΟΙ ΑΙΡΕΘΕΝΤΕΣ ΤΟΝ ΞΙΤΟΝ ΛΟΓΙΣΑΣΘΩ [N]
 ΕΝΤΩΙ ΔΗΜΩΙ ΚΑΙ ΤΑ ΧΡΗΜΑΤΑ ΗΚΟΝΤΩΝ
 ΡΟΝΤΕΣ ΕΙΣ ΤΟΝ ΔΗΜΟΝ ΚΑΙ ΕΣΤΩ ΣΤΡΑΤΙ [O]
 55 ΤΙ ΚΑΤΑ ΕΚΤΟΣΙΤΟ ΓΕΝΟΜΕΝΑ ΤΗΝ ΔΕ ΠΡΟ [K]
 ΑΤΑ ΒΟΛΗΝ ΤΗΝ ΕΚΤΩΝ ΗΣΩΝ ΜΕΡΙΣ ΑΙΤΟ [Y]
 ΜΑΠΟΔΕΚΤΑΣ ΚΑΙ ΤΗΣ ΠΕΝΤΗΚΟΣΤΗΣ ΟΣΟ
 ΠΕΡ ΠΕΡ ΥΣΙΝ ΗΥΡΕΝ ΕΚΤΟΙΝ ΔΥΟΙΝ ΔΕ ΚΑΙ ΤΟ [O]
 ΙΝΤΟΜΕΝΝΥΝΕΙΝΑΙ ΕΙΣ ΤΗΝ ΔΙΟΙΚΗ [N, K]
 60 ΑΙΤΟ ΛΟΙΠΟΝ ΜΗΛΦΑΙΡΕΙΝ ΤΩ ΔΥΟ ΔΕ ΚΑΤ [E]
 ΕΚΤΩΝ ΚΑΤΑ ΒΑΛΛΟΜΕΝΩΝ ΧΡΗΜΑΤΩΝ

vacat

GRANARIES

etc.

13. III. 86

For grain, granary, mill,
flour —

include MSBE nr 64

(Sindhu is way-
older)

nr 70, 74

Processing of grain

When I saw (year ago) a windmill on Mykonos operating, customers brought their sacks of grain, and took it home as flour.

But Fivos told me that ^{a few days ago} when she was a child in Naxos, somebody ^{from the mill} came to their home and took their grain to the mill, marking the sacks as containing their grain. The flour was sent back to the farmer (her father) from the mill. This must have been because there were enough mills to produce competition.

proportion to those of other large contemporary Minoan courts such as the "central courts", it might have been 62.29 m. to 72.05 m. long.⁹⁰

If this is indeed such a court, surrounded by a colonnade and other rooms, then the building could be another Minoan "palace" and the court equal in size to any other known Minoan court. Building J/T would become, as some already have argued,⁹¹ the fifth known Minoan "palace". If T were to be shown to have had a palatial form, its role, I believe, might be rather different from that of other palaces. I have pointed out elsewhere, for instance, the striking contrast between the scale and technique of Building T and the houses of the Kommos town.⁹² This, together with its location near the shore, suggest that T's role may have been colored by harbor activities. Moreover, T lacks some of the characteristics one expects in "palaces", such as the familiar religious objects, masons' marks,⁹³ and state or reception halls.⁹⁴ Finally, one might not expect to find another palace, usually thought to be a center of rule for a large area, so close to Phaistos and with a central court of roughly the same size.

Building P, as restored with its great galleries in Figure 10, also invites questions. Although its two phases of use are well defined, its plan is known only partially; we do not know how far it continued to either east or south. The galleries, nevertheless, form a coherent plan that we can discuss at least provisionally. In Figure 11 we provide some parallels from buildings in Crete, the Mycenaean Mainland, Asia Minor, Egypt, the Syro-Palestinian area, North Africa, and Roman Italy, the latter two from Graeco-Roman times.⁹⁵

⁹⁰ The estimate is based on the proportions, widths to lengths, at Zakros (12.09 × 30.30 m.), Malia (22.275 × 48 m.), Phaistos (22.25 × 51.70 m.), and Knossos (24 × 52 m.). For Zakros see J. W. Graham, "Further Notes on the Minoan Foot," *Acta of the Second International Cretological Congress*, Athens 1967, pp. 157-165, esp. p. 162; for Malia, J. W. Graham, "The Central Court as the Minoan Bull Ring," *AJA* 61, 1957, pp. 255-262, esp. p. 255, and *idem*. "Windows, Recesses and the Piano Nobile in Minoan Palaces," *AJA* 64, 1960, pp. 329-341, esp. p. 341; for Phaistos, *ibid.*, p. 339. The Knossian dimensions were scaled off the published plan, S. Hood and W. Taylor, *The Bronze Age Palace at Knossos* (BSA Supplementary Volume 13), London 1981.

Another, although faint, possibility is that the east-west dimension of the court represents its longer measurement. Taking 28.75 m. as a length, the width could then range from 11.47 m. to 13.27 m., and with its east-west orientation the court arrangement would not be unlike that at LM I-II Plati in the Lasithi Plain (J. W. Graham, *The Palaces of Crete*, Princeton 1962, p. 71 and fig. 30) where the court was a little over 16 m. wide. One can also suggest an analogy with Hagia Triada, with its open "central" space. (The space, however, is not enclosed, is quite irregular, and apparently was not even partially paved until LM III.) The difficulty with this explanation is that no traces of an east-west cross-wall on the south have been found so far and that a pebble-court surface, presumably LM I in date, was found at the appropriate level west of the southernmost gallery (P4). Further cleaning could clarify the matter.

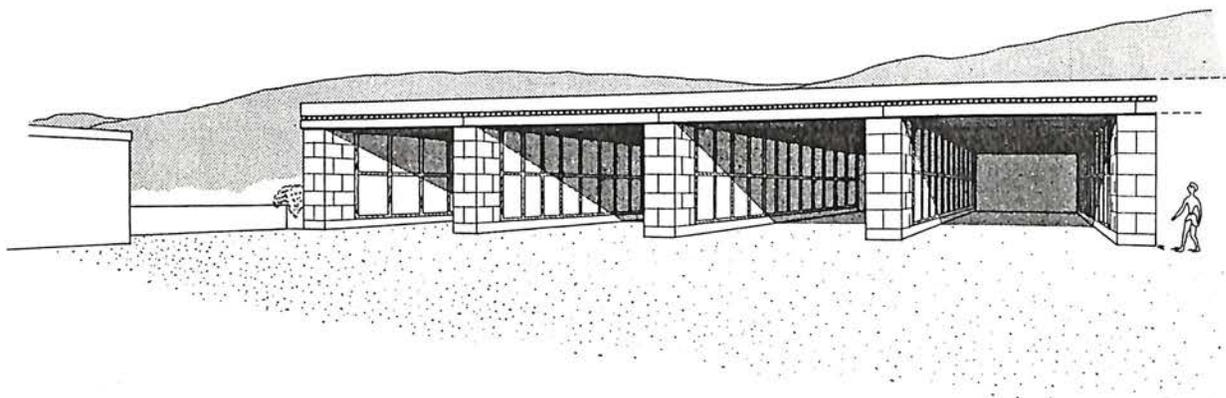
⁹¹ E.g. Betancourt in *AGMT*, p. 37.

⁹² *Kommos*, 1982-1983, p. 286.

⁹³ For a possible "+" mark, see *Kommos*, 1982-1983, pl. 55:b.

⁹⁴ If on the west, of course, they would have been destroyed by the sea.

⁹⁵ The sources for Figure 11 are as follows, from left to right: Knossos, detail of the West Magazines, after Hood and Taylor, *op. cit.* (footnote 90 above). Phaistos, West Storeroom area, after Graham, 1962, *op. cit.* (footnote 90 above), pl. 4. Hagia Triada, northern section of the great LM III stoa, after F. Halbherr *et al.*, "Haghia Triada nel periodo tardo-palaziale," *ASAtene*, n.s. 39, 1977 [1980], general plan. Tiryns "stoa" area in propylon area, after K. Müller, *Tiryns. Die Architektur der Burg und des Palastes*, Augsburg 1930, III,



KOMMOS

BUILDING P LOOKING EAST

JOSEPH W. SHAW · MARIA SHAW · GIULIANA BIANCO 1985

FIG. 10. Conjectural perspective restoration of LM III Building P from the southwest (J. W. and M. C. Shaw and G. Bianco)

Almost invariably, buildings with a series of relatively narrow, parallel rooms have been identified as places for storage of commodities and, sometimes, for sheltering animals. Some were magazines with pithoi in which liquids and other goods would have been kept, like those found at Knossos, Phaistos, and at Hagia Triada. The narrow rooms at Malia are undated but are probably Minoan. The latest research at Gla suggests that the buildings there are also storerooms.⁹⁶ The columned rooms at Megiddo may have functioned as stables.⁹⁷ Egyptian depictions of storerooms, such as those from the Ramesseum, often show ingots of copper, grain, storage jars, pottery, and exotic goods.⁹⁸ The *horrea* or warehouses at Ostia were intended for the storage of corn.⁹⁹ Those at Apollonia, on the other hand,

pl. I. Malia, submerged Minoan building near shoreline, after A. Guest-Papamanoli and R. Treuil, "Bâtiment immergé," *BCH* 103, 1979 (pp. 668-669), fig. 3 on p. 668. See also A. Guest-Papamanoli, "Discovery of an Important Structure in the Sea at Malia in Crete," *AAA* 13, 1980, pp. 99-101, where it is interpreted as a building connected with activities in the Minoan port. Gla, one of the two "stables" or storerooms, after G. Mylonas, *Mycenae and the Mycenaean Age*, Princeton 1966, fig. 74, and S. Iakovides, «'Ανασκαφή Γλά», *Πρακτικά* 1981 [1983] (pp. 92-95), pl. 86. Part of the storerooms in Temple I at Boğazköy, after R. Naumann, *Architektur Kleinasiens*, Tübingen 1974, fig. 597. A detail of the storerooms next to the funerary temple of Rameses II in Thebes, after W. S. Smith (rev. ed. by W. K. Simpson), *The Art and Architecture of Ancient Egypt*, Middlesex 1981, fig. 355 on p. 362. Megiddo, two of the "stables", after S. S. Lamon and G. M. Shipton, *Megiddo I*, Chicago 1939, fig. 3. Apollonia, a portion of the Greek shipsheds, after J. du Plat Taylor, *Marine Archaeology*, New York 1965, fig. 69. Ostia, northern part of the Horrea of Hortensius, from R. Meiggs, *Roman Ostia*, Oxford 1960, fig. 22.

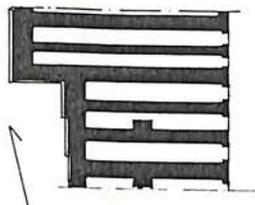
⁹⁶ Iakovides, *op. cit.*, p. 94.

⁹⁷ See J. Holladay, "The Stables of Ancient Israel," in *The Archaeology of Jordan and Other Studies presented to Siegfried Horn*, forthcoming.

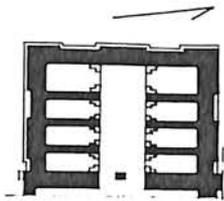
⁹⁸ The tomb of Meryra, in N. de Garies Davies, *The Rock Tombs of El Amarna, I, The Tomb of Meryra*, London 1903, pl. XXXI.

⁹⁹ Meiggs, *op. cit.* (footnote 95 above), p. 45.

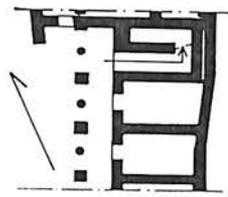
How do they
define it?



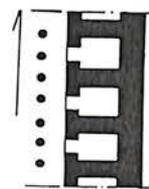
KNOSSOS
XVI C. B.C.



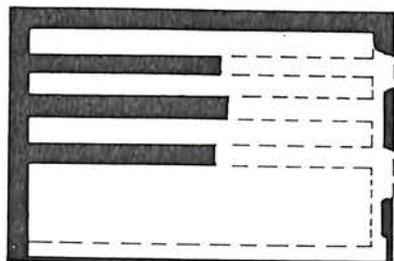
PHAISTOS
XVI C. B.C.



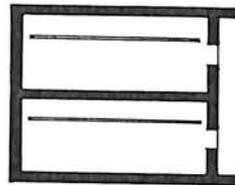
HAGIA TRIADA
XIV C. B.C.



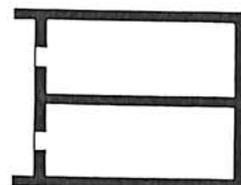
TIRYNS
XIII C. B.C.



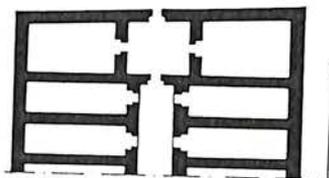
MALIA MINOAN BUILDING (UNDERWATER)



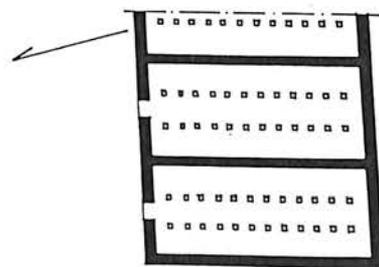
GLA
XIII C. B.C.



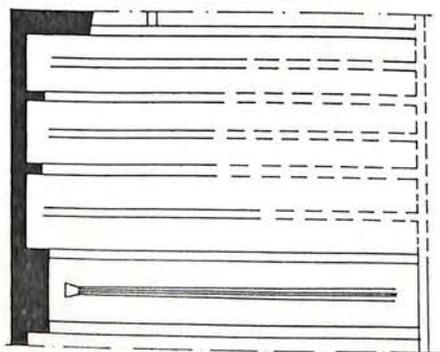
BOĞAZKÖY
XIII C. B.C.



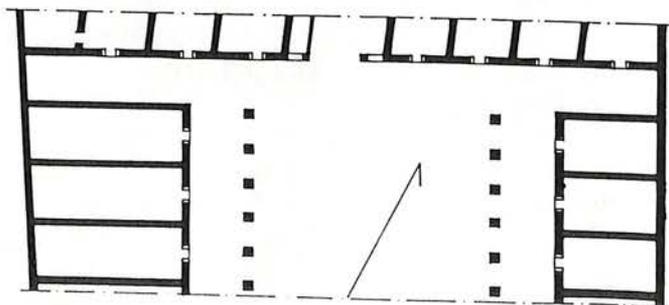
RAMESSEUM
XII C. B.C.



MEGIDDO I
X C. B.C.



APOLLONIA SHIPSHEDS
IV C. B.C. ?



OSTIA - HORREA OF HORTENSIVS
I C. A.D.

FIG. 11. Plans of various buildings with corridorlike rooms

sheltered warships. With the possible exceptions of the Malia and Apollonia buildings, partly destroyed by the sea, all the examples contrast with Building P at Kommos to the extent that their entrances are restricted either by a door or by a corridor, or both, whereas the galleries of P are completely open.

The plans suggest that the galleries in Building P could also be used for storage, possibly of local produce. Wood is a possibility, to judge from the extensive use of massive timbers in LM I-III architecture. It would certainly have been welcome in other lands such as Egypt where much of the wood was imported. On the other hand, timber, or even cut lumber, can usually be stored outside, rather than in an expensive roofed area. Grain could have been stored, for we know that great masses of grain were being collected at a still unidentified site ("da-wo") near pa-i-to (= Phaistos[?]), the grain representing 10,000 units, the produce of between 2,000 and 6,000 hectares of land, enough to fill the entire central court at Phaistos to a depth of over a meter.¹⁰⁰ In order for the galleries to be useful some means of confining the grain and protecting it from rot would have to have been devised, as in the series of round granaries in the southwestern part of the palace at Malia. No such evidence was found, however, either in the form of confining barriers or elevating platforms. Further problems are the unusual length and width given to the galleries, longer and wider than any of the Minoan storerooms in Figure 11, which makes the theory of grain storage doubtful. The same might apply to the alternative of storing textiles and wool for export, an industry suggested by the great numbers of sheep recorded in the Linear B tablets (some 100,000 sheep, requiring one quarter to one third of Crete for grazing), providing a base for export of wool and woolen goods.¹⁰¹

19.7x1.86
Sacks?
on a raised
wood floor?

In view of the lack of a satisfactory solution along these lines, it is worth considering a different theory proposed recently. The open, unprotected character of the galleries (if intended for storage) and their strange proportions (too long for their width) led M. C. Shaw to consider what might be stored in such large spaces that could not be easily stolen. One possible answer is ships. Estimated sizes of Bronze Age ships and comparisons with Classical shipsheds strengthen the possibility.¹⁰² She has also noted a possible depiction of such a building on the shore in the West House miniature fresco from Thera.¹⁰³ Possible contemporary parallels could be the still undated, long, parallel cuttings in the bedrock at Nirou Chani, identified by S. Marinatos as Bronze Age shipsheds on the basis of their proportions, size, and location next to a Minoan site.¹⁰⁴ There is also the very large, undated building

→ ¹⁰⁰ J. Bennet, "The Structure of the Linear B Administration at Knossos," *AJA* 89, 1985 (pp. 231-249), p. 247.

¹⁰¹ *Ibid.*, p. 236. See also J. T. Killen, "The Wool Industry of Crete in the Late Bronze Age," *BSA* 59, 1964, pp. 1-15.

¹⁰² M. C. Shaw, "Late Minoan I Buildings J/T, and Late Minoan III Buildings N and P at Kommos: Their Nature and Possible Uses as Residences, Palaces, and/or Emporia," *AGMT*, pp. 19-25.

→ ¹⁰³ *Ibid.*, p. 23 and pl. III:b. The building depicted is one story high with an exceptionally high ceiling, its rooms facing the sea. Another, similar building, also on the shore, is depicted in a fresco fragment from Hagia Irini on Keos. The façade consists of a vertical wall end (white [ashlar?]) and dark interior against a tan background. Near it men attend two tripod cauldrons on the shore next to what is probably the blue sea; K. Abramovitz, "Frescoes from Ayia Irini, Keos. Parts II-IV," *Hesperia* 49, 1980 (pp. 57-85), p. 62 and pl. 6:a.

¹⁰⁴ S. Marinatos, «'Ανασκαφὰὶ Νίρου Χάνι Κρήτης», *Πρακτικά*, 1925-1926 [1929], pp. 141-147.

30.VI.85 9.01
Suntby

From the meeting

Granaries? in Kuzov

AJA 89, 1985, pp. 308-316, various suggestions
about some pens or bins. Sinclair Hood suggests
for grain or pulses.

Granaries: Minoan

See AJA 88, 1984, p. 229. ^{S.D.} S.D. Indelicato

Walled pits, as at Mallis and Phaistos, called "Koulourai", large & massive construction. ^{about 16; exist up to 6.7 M} Of diameter up to 4 M. One thought to be rubbish pits (Evans) or cisterns (Pomeroy & Phaistos); now agreed to be granaries, cf. J.W. Gassman, The Palace of Crete (2) (Pomeroy 1972), pp. 134-5.

MM II cists, and got found over in MM III

GRAIN STORAGE 10
(CORN)

A.E. FRANKLIN TEXNOM



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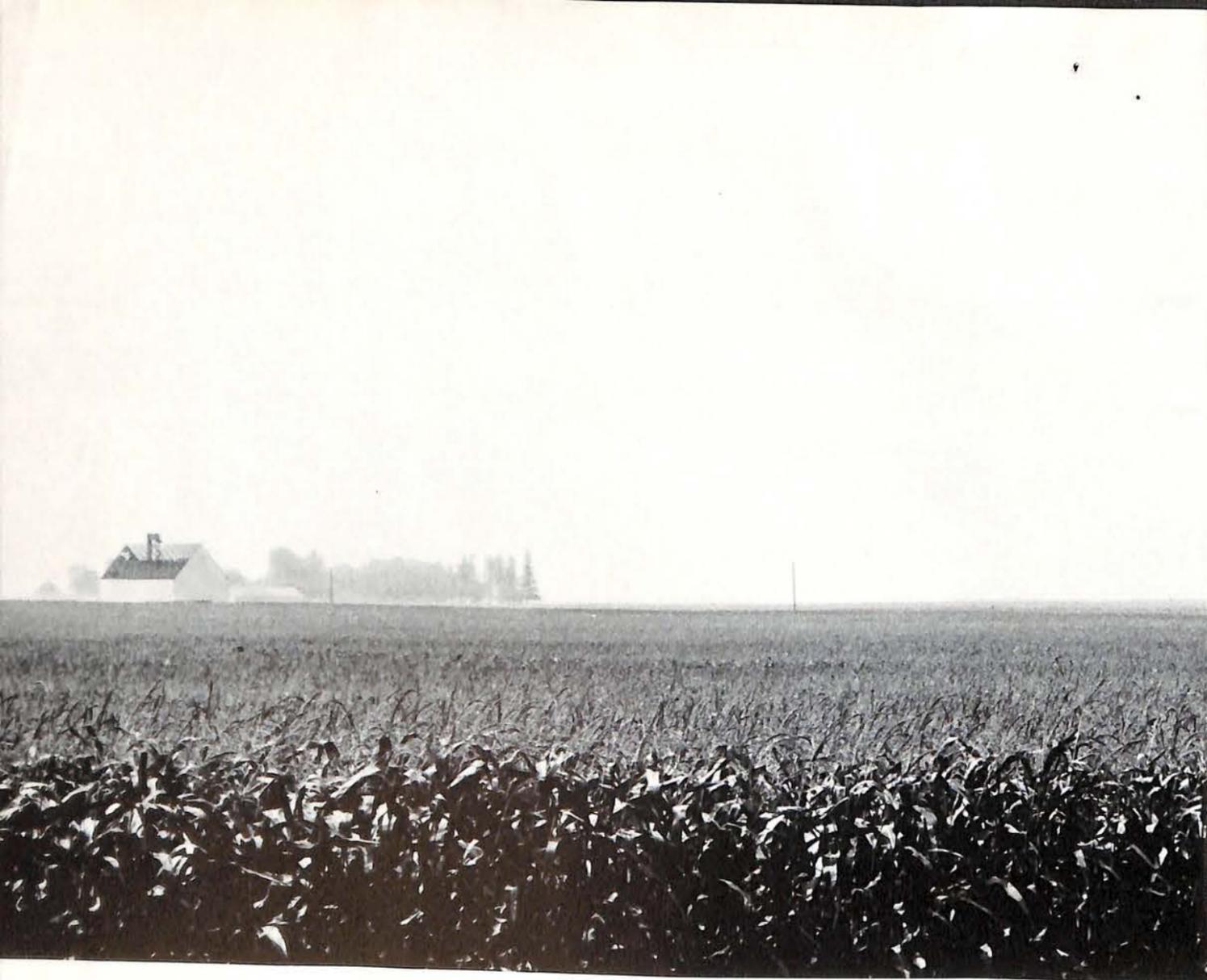
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JAGUAR XJ-S.



By John G. Mitchell

Where corn is king

It's the American grain and in the fertile soils of Grundy County, Iowa, it reigns supreme



Stretching clear to the horizon, a midsummer cornfield swelters in Grundy County's Palermo Township.

It strikes me as passing strange that corn does not stand taller among the popular icons of America. Over all the generations growing it, familiarity may have bred too much contempt. Ask a friend or stranger to name a single flash-card image that best reflects the country, and what are you likely to get? You get the skyline of Manhattan, the Statue of Liberty, the Capitol dome, the Grand Canyon, the Golden Gate. You might even get apple pie or the automobile. But *corn*? That stuff that sticks between your teeth? That tassel patch on some

hardscrabble hillside, that sultry green monoculture hugging the undulant midlands, that chicken feed? Why corn?

Well, why *not* corn? It is absolutely 100 percent indigenously American. It runs with the land. It was here thousands of years before pale-skin rovers swooped in from Europe; and for nearly three centuries thereafter, its cultivation and harvest and conversion to foodstuffs occupied more time in the lives of most Americans than any other farm pursuit, bar none. It was corn, and the soils needed

to grow it, that pulled the Republic west to the sundown sea. It was corn that made it possible for many of the earliest settlers to survive. And as it runs with the land, so does the husky heritage of corn course through the language. Our slang is starched with it; our songs, too. "I'm as corny as Kansas in August," wrote Oscar Hammerstein II, with scant concern for the fact that Kansas is much better known for its wheat.

Corn, unlike wheat, is practically ubiquitous. It is grown in every one of the coterminous United States. It

Photographs by David Plowden

Hawkeyes of Grundy County reflect their land: easy-going on top, full of energy underneath

covers, in season, a full quarter of the nation's cropland. In total volume of production, it ranks Number One. Of all the grains, it is the most efficient converter of solar energy; one acre of corn can yield the equivalent, in bushels, of three acres of wheat. Even in an off-year such as 1983, when devastating drought and a new federal payments program cut production almost in half, corn growers here harvested more than four billion bushels—almost enough to supply one bushel to every single human on Earth.

The uses of corn are ubiquitous, too. Refined, the bulk of it is starch; and corn starch finds its way into cardboard, crayons, lubricants, plastics, wallpaper. From the starch, too, comes syrup. And that finds its way into baby foods, ice cream, pickles, marshmallows, salad dressings and soft drinks. Corn dextrose is used in the processing of antibiotics and rayon. Corn alcohol supplies us with bourbon, bay rum, ethanol, deodorants, resin, incense and mouthwash. Corn oil conjures up margarine, mayonnaise, shortening, soap. And last but by no means least, there is just plain corn—sweet corn on the cob for human consumption, or (and here is by far the most common use) field corn that is used to feed chickens and cows and pigs.

To appreciate the native grain, one is fairly compelled to look beyond the

statistics and by-products to the kind of country where people view corn as king. So last year, toward the end of planting time, I skedaddled out past the skylines to Grundy County, Iowa, just off geographic center of the nation's top corn-producing state. Now Grundy itself is not consistently the top producer among Hawkeye counties, but it comes close enough with yields jumping ten bushels an acre above the state average, 15 above the national. It is a gently rolling county, Grundy, though flat-out in some places, and it is blessed with soils that are counted among the richest in the world—Tama and Muscatine and Garwin and Dinsdale and Klinger, in various associations—running to depths of three to four feet, loamy,



Dennis Lauterbach has handled corn at the feed mill in Dike for 18 years.

friable, organic, spongy to the rains, and of a certain color falling somewhere between German chocolate and briquette black.

Given such a fertile base, precipitation averaging 32 inches a year, and generally salubrious temperatures for the long growing season, it's not sur-

prising that almost 95 percent of Grundy County is given over to the production of agricultural commodities. There is space for hay and oats and assorted seed crops, and pasture for livestock. There are feedlots and pig markets. But more than anything else, there are great expanses of cropland on which the farmers of Grundy County grow their prodigious yields of soybeans and corn. The leftover land is where the people live—two or three farmhouses to the square mile, and, for those who cannot live by soil alone, such tidy, compact communities as Grundy Center, Reinbeck, Dike, Holland, Wellsburg, Stout and Conrad, "the Black Dirt Capital of Iowa," down there in the Tama-Muscatine.

To this outlander, the Hawkeyes of rural Grundy County seem a solid, rooted lot. They reflect the country: open and easy on the surface, energy-intensive underneath. It is not a place conducive to loafing. The days afield are long ones; at planting and harvest times, twice as long as an office worker's. And the back-road miles can stretch across half the county to town or to school, where sporting events tend to provide the social focus. Urban skylines may send vibrations to rattle the edge of the farmer's world, but in Grundy one perceives a certain resistance. There is a holding fast to family values and traditional country ways.

Not that all those ways can be quite the same as they were 50 years ago when Grant Wood, over in Cedar Rapids, was painting his dairy-barn farmscapes and American Gothic pitchfork folk (SMITHSONIAN, November 1980). Here in Grundy, most of the dairy barns are long gone, and the milk cows with them; and the tool in the farmer's hand is no longer the pitchfork, it's a pocket calculator. And the Gothics are gone, too, to the cemeteries. In Wood's day, a farmer with three sons could safely figure to pass his place on to the eldest and know that the other two would somehow contrive to go on farming, some-



Richard Bockes and his brothers sell most of their corn to a grain dealer.

where else. It does not happen that way anymore here in Iowa, unless the legacy is untypically large in measure of acres and paid-up machines.

What is happening with alarming frequency in Iowa and other parts of the Midwest these days is farm bankruptcy and foreclosure. Squeezed by high interest rates, lower prices, bad weather and a crushing debt load, hundreds of farmers throughout the nation's breadbasket and corn belt are going under. Even longtime family operations once thought to be immune to foreclosure—typically, a father-and-son team who plowed their 1970s profits into expansion rather than debt retirement—are in trouble. Southern Iowa is one of the hardest-hit areas in the country. Grundy County, a little farther to the north, has managed to escape disaster so far but only because its weather has been better during each of the last three growing seasons.

Spring is a good time to be in Grundy County, first time ever. Not

John Mitchell, a field editor with Audubon, is the author of Bitter Harvest. David Plowden is noted for his photographs of the Midwest.

much corn to see yet, except in the silos and grain elevators etching a skyline of their own above the planted fields. But new corn is on its way, out there between the chocolate furrows, kernels buried, seminal roots already sipping moisture from the soil. Though not nearly so *much* new corn, spring of 1983, for there is this surplus in storage—the accumulated yield of bumper crops and trade embargoes—and Uncle Sam is giving corn growers "payments in kind" (PIK, they call it) to idle portions of their fields. The program will not be offered again next year, and so to take advantage of it, Iowa farmers have cut back their corn acreage by about 40 percent. Still, apart from the stalks and stubble of the fallow fields, everything looks spanking fresh this fine spring day in Grundy County: gingerbread porches, conifer windbreaks, John Deere combines and the unseen corn a-going it in the Muscatine. Me, I'm on my way to the Bockes farm.

Bockes is a big name in Grundy County, and an old one, too. The founding father, Lewis the Pennsylvanian, purchased a patch of prairie here in 1855 when it was all plow-busting sod. Because of one thing or another, including the Civil War, no Bockes got around to farming it until 1870. They have been here ever since, growing corn. Father to son, Samuel to Simon, Simon to Dale, Dale to Richard and Robert and Roger. Four generations of Bockes, 113 crops of corn. And fast hands. In 1934, Dale's brother, Clarence, won the Iowa Corn Husking Championship by husking 2,263 pounds of corn in 80 minutes. A rate of one ear per second—seized, stripped and tossed.

It is planting time. Richard, Robert and Roger are off in their big John Deere Model 7000 16-unit planters, sowing their fields with seed, herbicide and insecticide—one-two-three, just like that. All in 16 rows.

Their mother, Mary Bockes, stands with me at the roadside. "My dad used horses," she says.

We watch one of the planters top a swell in the undulant land. Faraway, silhouetted in the afternoon light, the machine turns the color of Muscatine, then melts down the far side of the rise. "You hardly ever see a horse in Grundy County nowadays," says Mary Bockes. "How fast things change."

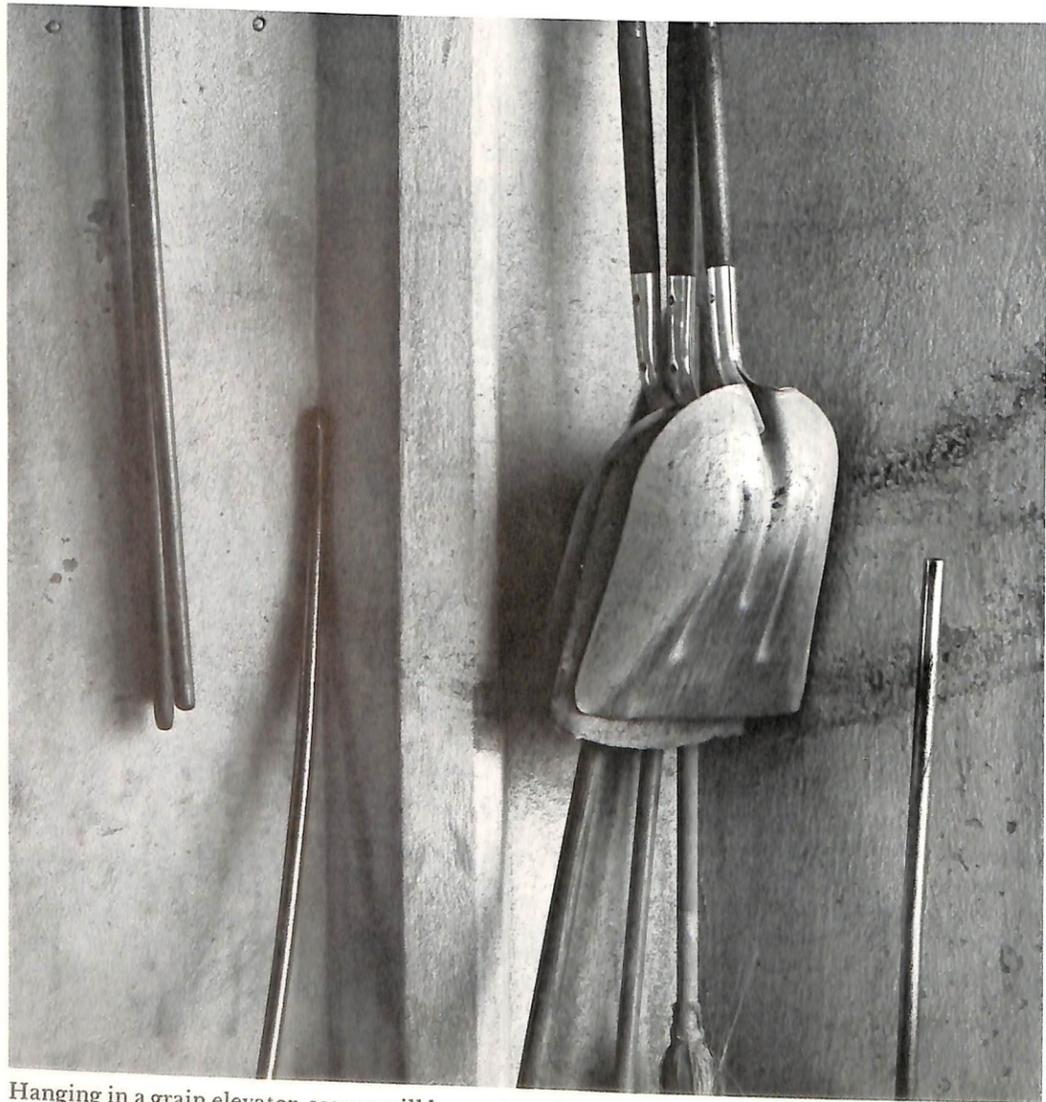
Change was a great deal slower, once. Consider the ice. It stopped right here in Grundy County, piled up a high moraine, then skulked away, leaving its silty gift to the wind. The wind made loess of it, sifted it out across the land, packed it in thick eolian layers over the glacial drift. And after the loess came grass—blue-stem and switch grass, maybe, though species more primitive likely took root here first. To measure that time frame, that change, best to start counting in tens of thousands of years.

Once, too, probably in a different, more humid sort of country, there was another grass so primitive, so long lost to our modern way of accounting for such things, that we have not even settled on a name for it. No matter. Whatever we might someday agree to call that grass—it was eventu-

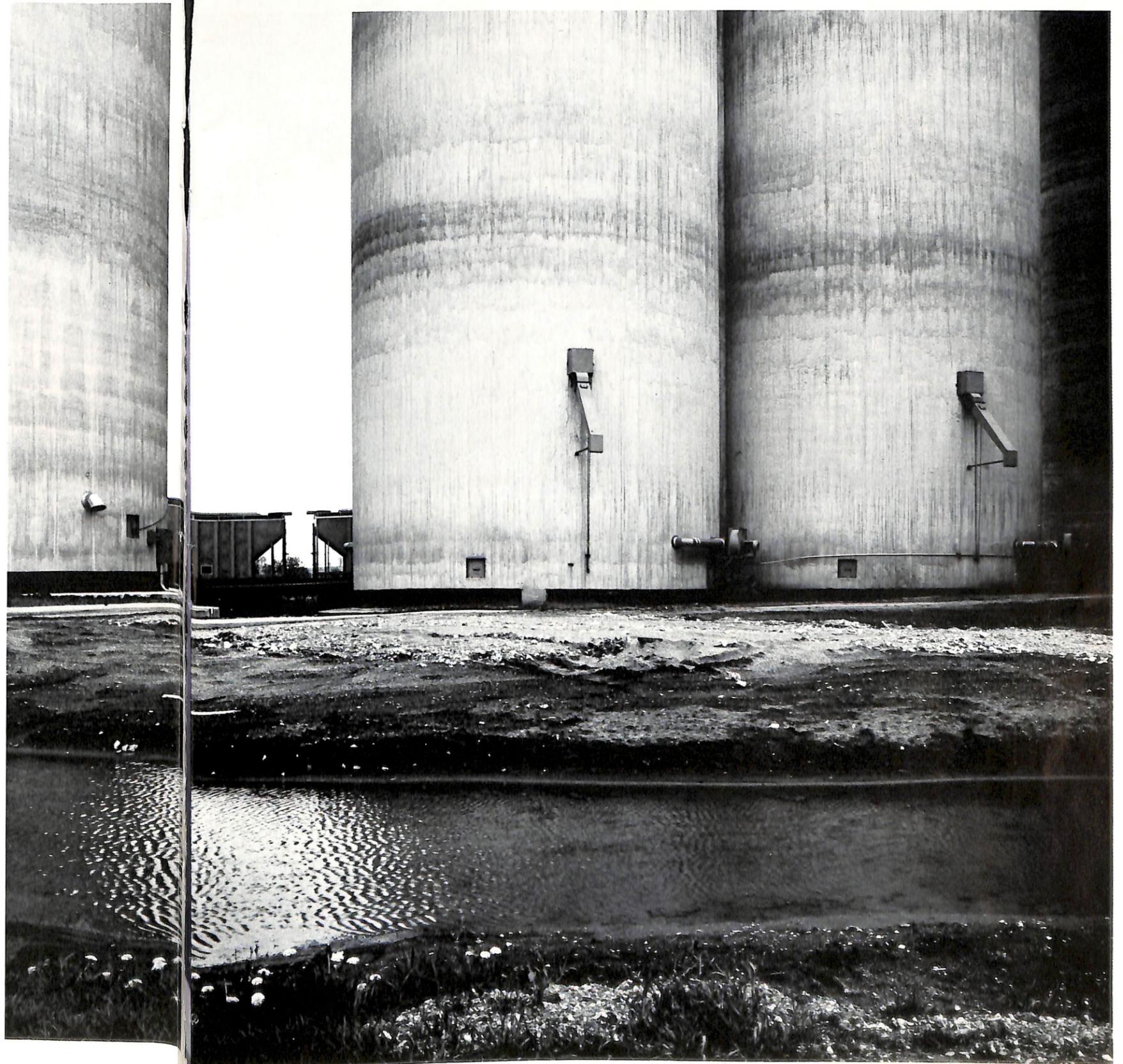


Roger Dudden grows enough corn on 400 acres to feed 3,000 hungry hogs.

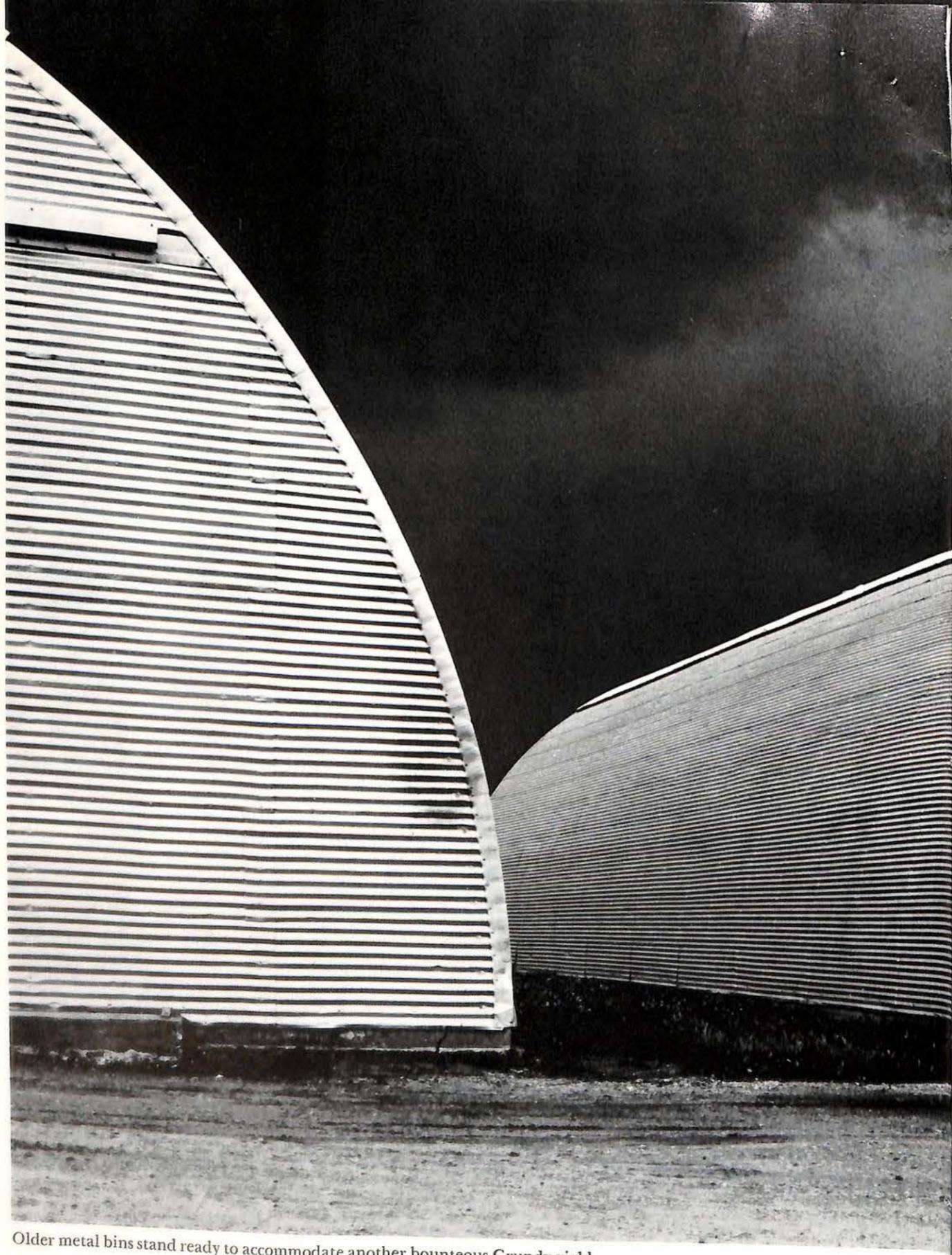
Grundy County epitomizes many of the changes that have transformed American agriculture in recent years. Its farms are much larger now, and mechanized. Its old wooden barns have given way to immense new structures of metal and concrete. But everyone still worries about the weather, for Grundy's corn will always need rain in order to grow.



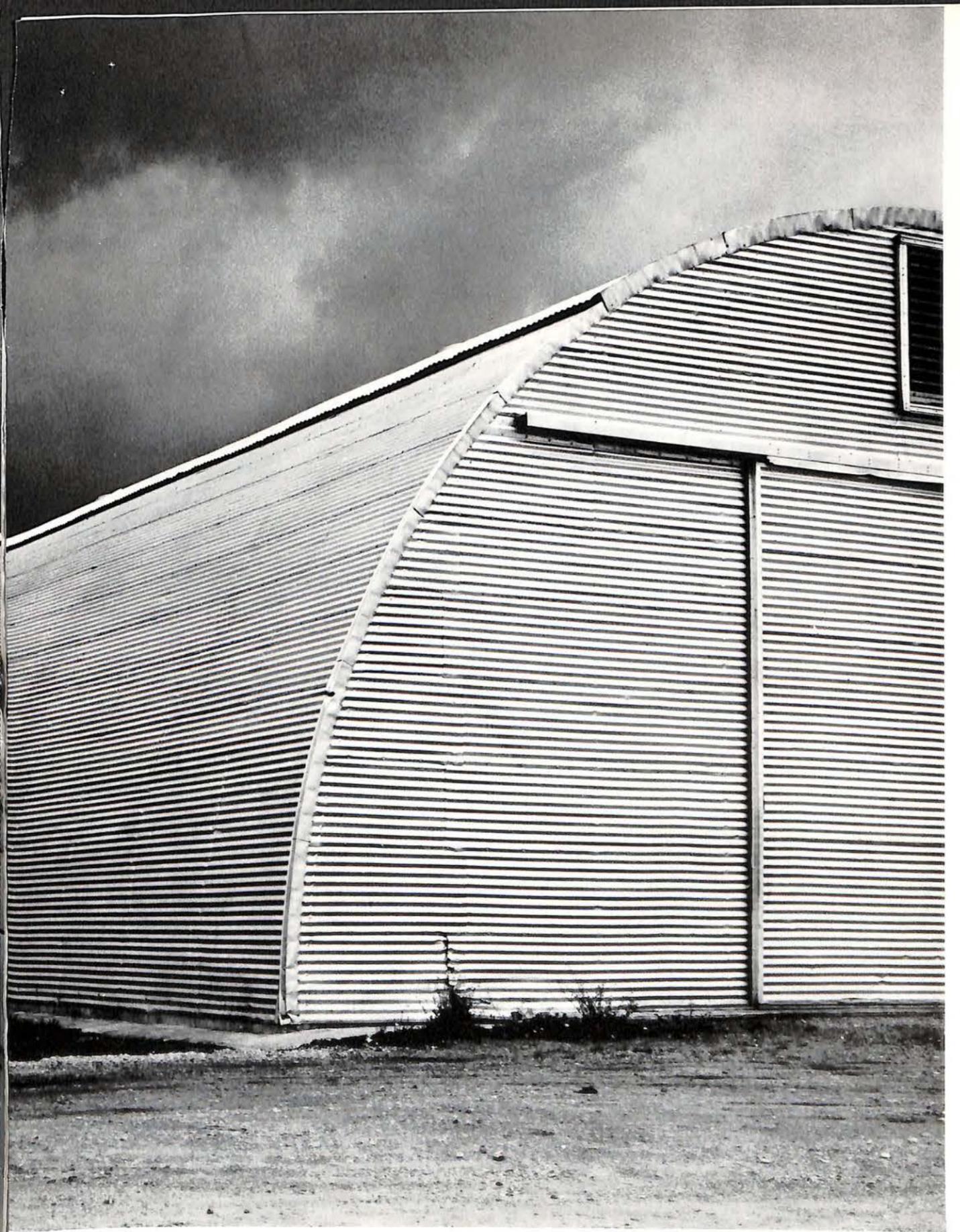
Hanging in a grain elevator, scoops will be used to pick up every last kernel of corn.



Modern storage silos in Reinbeck are an upright presence in a horizontal landscape.



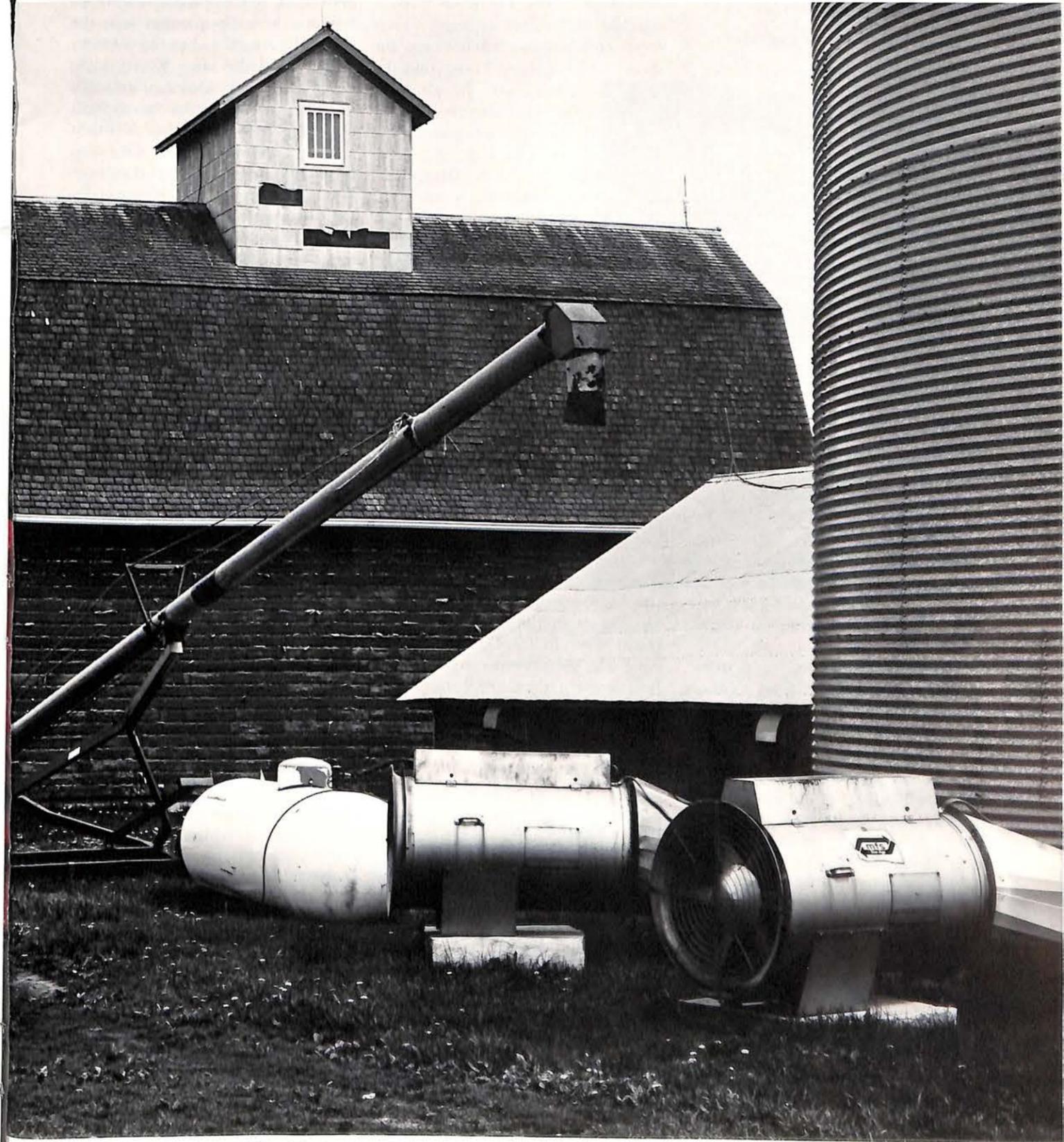
Older metal bins stand ready to accommodate another bounteous Grundy yield.





Spring rainwater runs off the soil in freshly saturated Grundy field.

After pollination, these tasseled stalks near Palermo will bear full ears of corn.



Two ways to dry corn at Glen Hockemeyer farm: old crib and new blowers (right).

Grundy County is not immune to family-farm bankruptcies but so far it has escaped disaster

ally domesticated as corn. This was not the Bockes kind of field corn, nor the sweet corn that sticks between the teeth, but a tough ancestral species bearing fruits the ancient people of America would learn to utilize as food. Where exactly corn first came under human cultivation remains a secret, but archaeologists are certain that corn was cultivated widely by Amerindians for at least 3,000 years of pre-Columbian time, and likely a good deal longer.

Relict cobs, charred or petrified, have been uncovered from southern Canada to Chile, from tidewater to plateaus two miles high, in almost every known cultural niche—Algonquian, Athapascan, Aztec, Maya, Inca. Then, in a perversity of European logic, Columbus was said to have discovered America. Wheat-eaters, long bored with their own thin breads, cheered. For now, by the same twist of the Caucasian mind, it could be said that Columbus had also discovered corn.

Indian corn under paleface cultivation spread far and wide. By 1790, America had a corn belt. It reached out of the Cumberland and Shenandoah valleys, across the Appalachians, to the western traces of Kentucky and Tennessee. Even then, corn was a thing of abundant variety. Once Puritan preacher Cotton Mather had noted how corn in a Massachusetts

field took on the hue of the kernels upwind, nothing would stop planters from crossbreeding their crops for showiness and yield. Thus, from the Indian's flint corn (tough and starchy), the southern gourd seed (softer and dented), and possibly an aboriginal sweet corn or two, there emerged Reid's Yellow Dent, Darling's Early, Golden Sioux, Mandan, Boone County White, Bloody Butcher and Tom Thumb. All these and heavenly hundreds of others, too—and all by the time the Bockes were getting to feel at home on the Muscatine.

I have left Mary Bockes down the road at the ancestral farm, and I am walking alone now among the gray headstones of the Alice Union Cemetery. Here is the oldest: Sarah Price, 1829-1870. Here are Heltibridle, Katzer, Klinefelter, Martz, Minich, Strickler. And here are the Bockes. Samuel, 1840-1937. Simon, 1868-1955. Dale, 1910-1977. From stone to stone, the engraved time frame is barely a century and a half, yet it runs from acre yields of 25 bushels to 160, from sod-cabin corn patch to square-mile sections, from the hoe to the moldboard plow to the Deere 7000. Beyond the headstones, the horseless fields of Grundy County stretch out of sight and out of mind. How fast things change.



Worker helps dump shelled corn from truck into a grain elevator in Dike.

In Iowa, nothing changes quite so fast as the weather, unless it is the price of corn. Big, brawny weather boils out of the High Plains, stabs down from the Dakotas, or rolls up sultry and hot from the Gulf. It keeps the farmers guessing. There is a saying here that you can lose a crop three times before you get it to market. In the year of PIK, it's a wonder there was any corn crop at all.

First to Grundy County came the rains of May, chasing me out of the Alice Union Cemetery and the Bockes out of their fields; drenching rain, more than three inches in a day and a half, pooling up in the furrows between the rows of newly sown corn. I went out of the rain into Richard Bocke's machine shed, where he was ministering to a piece of equipment on one of his Deere tractors. The unit, with its cab enclosing a space-age computer to monitor the distribution of seed and chemicals, represents an investment roughly equivalent to the full purchase price of a four-bedroom house in some upper-crust suburb. For all that money, the tractor gets to work off its debt only three months of the year, during planting and harvest times. And now, this—the machines idled, the pools in the fields, and raindrops drumming on the roof. "I hope it lets up soon," I said to Richard Bockes. And he said, "So does my banker."

The weather let up, all right—and then threw a scorching tantrum across the whole wide corn country. Record-high temperatures in some places and, in others, hardly a trace of precipitation. From the Carolina piedmont to the sand hills of Nebraska, a drought reminiscent of dust-bowl days settled across the nation's cornfields. Some turned October brown under the August sun. Governors drew lines around blocs of rural counties and called them disaster areas. But not around Grundy County. Sure, the kernels would be stunted a bit on the cob, the yield off by ten to 15 percent in most of the fields. But there would

be no drought disaster in Grundy County—not this year, at any rate—thanks to those deep and spongy eolian soils. Down two feet in the Tama-Muscatine, even in August, corn roots were slaking their thirst on the rains of May.

At the height of the drought, I returned to Grundy County and called on some of the growers I had met in the spring. Richard Bockes was back out behind his machine shed again—"shed" is misleading; the structure is closer in size to an airplane hangar—and he said he was hoping the drought would lift and let in some rain. I didn't have to ask what his banker was hoping. Inside the shed were two new John Deere Turbo 8820s, dwarfing the 7000s of yesteryear and representing, said Bockes without specificity, "an ungodly investment." Come late September, weather permitting, Bockes and his brothers would be climbing into these mechanical behemoths to harvest corn and soybeans from a spread measuring 5,000 acres. "It'll take us," he figured, "about eight weeks. Not counting sleep."

Farming on such a grand scale is not yet typical of Grundy County, but it appears to be heading that way. A generation ago, the basic size of the family farm was a quarter-section—160 acres. Now, given the economics of mechanized agriculture, a grower can hardly start off with much less than half a section, and many are working a full one or more. Each year, the overall number of farms in the county declines a few digits—folks sell out, or die with no farming heirs to carry on; a few, stretching debt beyond the edge of cash flow, go bankrupt. But the land under cultivation remains fairly constant. One less farm simply means one or two others growing larger. More land, more machinery, more debt. No wonder a Grundian knows what his banker is thinking when the weather turns bad.

Even in the best of weather, the



Reinbeck (population 1,800) is a typical corn-belt town where farmers can usually find what they need around Main Street and Blackhawk.

cost of preparing and harvesting an acre of field corn is prodigious. Cooperative Extension Service economists in Iowa last year drew up this bill of particulars for an acre yielding 115 bushels of corn: machinery costs, including depreciation, interest, insurance, fuel, oil and repairs, about \$83; land, at cash rent equivalent, \$120; seed, fertilizer, herbicide, insecticide and such variables as crop insurance, \$91; and labor, figured at \$6 an hour, about \$19. Total cost: \$313, or \$2.72 a bushel. Not bad, if corn is selling at \$3 a bushel. But if the price should drop, if too much rain or drought should shrivel the yield—not good enough.

There is no easy formula for agricultural success—or survival—in Grundy County. Each grower tailors his operation to suit a particular ex-

pectation of next year's market and a knowledge of what his soil can best produce. In fact, if you parsed these farms with no regard for their relative size, you would probably find no two in the county exactly alike. Diversity is rampant.

The Bockes, for example, sell almost all their corn to the proprietors of a grain elevator—that perpendicular bridge between grower and consumer, between the field and the shelf. Of those who do not work on farms in Grundy, more than a few can be found toiling in or around grain elevators instead. Dennis Lauterbach, for example, has worked in the feed mill, next door to the grain elevators at the Farmer's Co-op in Dike, for 18 of his 43 years. One of his jobs is to help store corn and other grains that will be processed for livestock.

More land, machines, debt.
No wonder a Grundian knows
what his banker is thinking

Cross-county, north of Reinbeck, Roger and Marcia Dudden plant half of their 800 acres to field corn, but sell none of it; shelled, it is just enough corn to feed what they do sell—their hogs. Over in Palermo Township, Gerald and Mary Lou Strickler grow no field corn to speak of, yet consign half of their 350 acres to the production of seed corn—the stuff that gets Bockes and Dudden started anew in the following year. And yonder in Colfax Township, Glen and Neva Hockemeyer last year put 200 acres into the PIK program; 400 into soybeans, pasture and hay, and 300 into field corn, of which, when harvested, four out of every ten ears would be kept on the farm to feed cattle and hogs, and the rest of that crop sold for cash income.

The road to the Hockemeyer farm was a sea of mud when I wallowed through in May, a ribbon of dust in August. We sat both times in the kitchen of the farmhouse, and we talked of the weather and the price of corn and the changing ways that can creep right up on you if you don't take notice. There had been a number of dairy farms in Grundy County when he and his wife moved here, Glen Hockemeyer said. That was only 13 years ago, and now almost all the herds were gone, the great old American Gothic barns good for nothing but tool sheds, or kindling. Now-

adays, some Grundy folks were even stepping away from beef cattle. Moving to hogs—the “best mortgage lifters going,” said Glen Hockemeyer. Only six months to market, a cash flow much faster than beef's. Easier on the feed, too. Only three pounds of corn to produce one pound of pork.

On the breakfast table that August morning lay the *Des Moines Register*. Page One of the Home & Family Section proclaimed beef and other high-fat foods to be America's “Health Enemy No. 1,” while pork got off with the lightest of raps on its chinny-chin-chin. “That's another reason we're shifting to hogs,” said Neva Hockemeyer. “The housewife reads that and she's just not going to buy that much beef. So what are we to do? Does the consumer want more pork? More cereal? We were told to go out and grow all this corn. . . .”

“And we grew it,” her husband put



One of Grundy's best corn producers, Glen Hockemeyer has soybeans, too.

in. “We had two eight-billion-bushel crops in this country, back-to-back, '81 and '82. We also had a grain embargo on the Russians. Now we have PIK. But we won't have it next year. Next year, they'll be telling us growers to plant fence row to fence row all over again.” (In most parts of the country, in fact, the amount of corn planted this summer did rebound to

pre-PIK levels.) “Well, I'd like to know something,” said Neva Hockemeyer. “What do people want us to do with all this corn?”

Hockemeyer himself might well be counted a part of the problem—if, after all, it is a problem—for he is a savvy steward of the Tama soils, and just two years or so ago his corn yield, at 184.7 bushels per acre, was ranked second highest of all the farms in this high-yield county. “It'll be way down this year,” he said. “And if we don't get some rain soon, maybe as low as 120 bushels.”

He walked me to my car. He had something in his wallet he wanted to show me. It was a little dog-eared card. *The Farmer's Last Will*. It bequeathed to the weatherman “rain, sleet, and snow for the funeral,” but strangely, no drought. It said to the gravedigger: “Don't bother. The hole I've dug for myself over the years should be deep enough.” He broke into a grin as wide as a Halloween pumpkin's. “I keep it,” he said, “for good luck.”

I wished him bushels of luck and went down the ribbon of dust to the hard-top, and followed that east to the airport at Waterloo, next county over. Then an airplane came out of the hard sky and took me away. As we circled, climbing for altitude, I looked north through the window and saw a wall—a mountain range—of anvil-head clouds closing in, and we raced them all the way to the Mississippi River. I have no idea how many inches of rain fell behind us on Grundy County that afternoon. I only know that its timely arrival allowed Glen Hockemeyer to cancel “the funeral,” and that, whatever the weather, he is out there now with the Bockes and Duddens and Stricklers, each fine family carving its own indomitable niche one crop deeper in the American grain.

With giant combine, Richard Bockes harvests up to a ton of corn a minute.



Bringing baby home in the Peugeot

She has ten tiny fingers, around which she has already wrapped her grandparents. And ten tiny toes.

She has enough clothes to stock a small store, including eight pairs of little knitted booties that will never stay on.

Her face goes scarlet with anger if there's any stalling at feeding time.

There is some agreement that she looks like her grandmother on her mother's side—although this notion does not sit well with the other side of the family.

Dad will get up and check her fourteen times during her first night at home, each time making a mental note to do something about the creak in the floorboard.

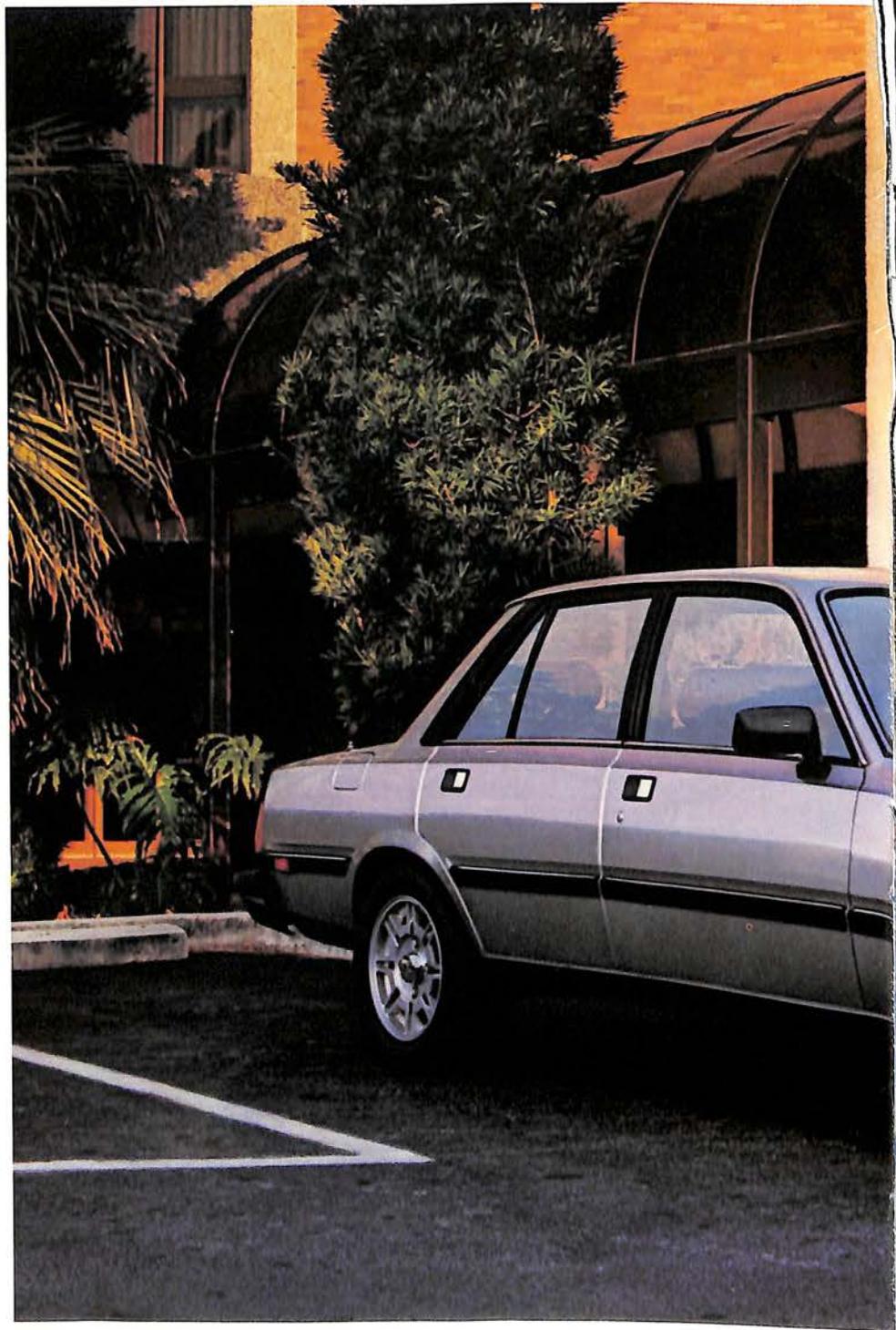
She has pudgy cheeks, fat little knees, and almost no hair.

She is, they agree, the most beautiful baby anyone ever had.

Oh, the responsibility of it all!



The 505 STI's seats are wrapped in a soft, supple leather, with the front pair heated in the winter. Comfort of body, indeed.



The car they are bringing baby home in (Dad will drive very, very carefully) is a Peugeot 505 STI.

It is a veritable fortress of strength. The occupants are cradled within a body that is welded in 4,032 places. The body is protected by 21 separate anti-corrosion measures.

The steering of the Peugeot is itself

a form of safety device. It "knows" when to step in and help the driver... and precisely how much help is needed. If the road is icy or wet, the amount of power assistance is automatically cut back so that you retain the feel of the road through your fingertips.

The Peugeot is very much a car for comfort of mind.

Burns, J. royal granaries & Chalcis

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XXXI. 22. 4

TITI LIVI

A.V.C. 554

5 uenisset, circa Apolloniam hibernabat. Ab classe, quae
 Corcyrae subducta erat, C. Claudius triremesque Romanae,
 sicut ante dictum est, Athenas missae cum Piraeum peruenis-
 sent, despondentibus iam animos sociis spem ingentem at-
 6 tulerant. Nam et terrestres ab Corintho quae per Megara
 7 incursiones in agros fieri solitae erant non fiebant, et praed-
 onum a Chalcide naues, quae non mare solum infestum sed
 etiam omnes maritimos agros Atheniensibus fecerant, non
 modo Sunium superare sed ne extra fretum (quidem) Euripi
 8 committere aperto mari se audebant. Superuenerunt his tres
 Rhodiae quadriremes et erant Atticae tres apertae naues, ad
 tuendos maritimos agros comparatae. Hac classe si urbs
 agrisque Atheniensium defenderentur, satis in praesentia
 existimanti Claudio esse maioris etiam rei fortuna oblata est.
 23 Exules ab Chalcide regionum iniuriis pulsati attulerunt
 2 occupari Chalcidem sine certamine ullo posse; nam et
 Macedonas, quia nullus in propinquo sit hostium metus,
 uagari passim, et oppidanos praesidio Macedonum fretos
 3 custodiam urbis neglegere. His auctoribus profectus quam-
 quam Sunium ita mature peruenerat ut inde prouehi ad
 primas angustias Euboeae posset, ne superato promunturio
 conspiceretur, classem in statione usque ad noctem tenuit.
 4 Primis tenebris mouit et tranquillo peruectus Chalcidem
 paulo ante lucem, qua infrequentissima urbis sunt, paucis
 militibus turrim proximam murumque circa scalis cepit,
 5 alibi sopitis custodibus, alibi nullo custodiente. Progressi
 inde ad frequentia aedificiis loca, custodibus interfectis re-
 fractaque porta ceteram multitudinem armatorum ac-

22. 5 Athenas B: -nis x despondentibus] des- B: dis- ψ: de- φ
 6 Megara x: -am B; cf. c. 25. 2, 24. 30. 9 adn. 7 ne Bx, suppl.
 quidem post fretum Novák, post Euripi Weissenb.: nec Asc., sc. nec = ne...
 quidem, sed sic ap. Liuium praecipue ad pronomina, fere ut Gr. οὐδέ, neque
 debet legi per coniect.; potius cf. 36. 17. 10; eadem ratione ad 44. 36. 8
 23. 3 statione φ: -em Bφ

A.C. 200

AB VRBE CONDITA

XXXI. 23. 5

ceperunt. Inde in totam urbem discursum est, aucto etiam 6
 tumultu quod circa forum ignis tectis iniectus erat: con- 7
 flagrarunt et horrea regia et armamentarium cum ingenti
 apparatu machinarum tormentorumque. Caedes inde passim
 fugientium pariter ac repugnantium fieri coepta est; nec 8
 ullo iam qui militaris aetatis esset non aut caeso aut fugato,
 Sopatro etiam Acarnane praefecto praesidii interfecto, praeda
 omnis primo in forum conlata, deinde in naues imposita.
 Carcer etiam ab Rhodiis refractus emissisque captiui quos 9
 Philippus tamquam in tutissimam custodiam condiderat.
 Status inde regis deiectis truncatisque signo receptui dato 10
 conscenderunt naues et Piraeum, unde profecti erant, re-
 dierunt. Quod si tantum militum Romanorum fuisset ut et 11
 Chalcis teneri et non deseri praesidium Athenarum potuisset,
 magna res principio statim belli, Chalcis et Euripus adempta
 regi forent; nam ut terra Thermopylarum angustiae 12
 Graeciam, ita mari fretum Euripi claudit.

Demetriade tum Philippus erat. Quo cum esset nuntiata 24
 clades sociae urbis, quamquam serum auxilium perditis (rebus)
 erat, tamen, quae proxima auxilio est, ultionem petens, cum 2
 expeditis quinque milibus peditum et trecentis equitibus
 extemplo profectus cursu prope Chalcidem contendit, haud-
 3 quamquam dubius opprimi Romanos posse. A qua destitutus
 spe nec quicquam aliud quam ad deforme spectaculum
 semirutae ac fumantis sociae urbis cum uenisset, paucis uix
 qui sepelirent bello assumptos relictis aequae raptim ac
 uenerat transgressus ponte Euripum per Boeotiam Athenas
 ducit, pari incepto haud disparem euentum ratus respon-
 surum. Et respondisset, ni speculator—hemerodromos uocant 4
 Graeci, ingens die uno cursu emetientes spatium—con-

9 quos] post con. eo Gron.
 24. 1 (rebus) suppl. Lucbs; cf. 27. 47. 7 2 peditum x: om. B; cf. c. 16. 3
 + hemerodromos] -os Asc.: -as Bx; ad Pl. cf. 22. 57. 3 emetientes Bφ: -nsψ

GRANARIES

See 'Milit. Str. Def.'
p. 747

From MBW: date of events described, ca. 200 B.C.

Living history in time of Augustus

Living history (last attended)

MBW translate at night!

Exodus drives from Chelbis by the instigation
of royalists (?) managed that Ch. d. b. occupied
without any struggle. For both I was to see that
Macedonia, since there was no fear of enemies
near at hand were wandering about everywhere,
and the townsfolk relying on the Macedonian
garrison were neglecting the safe keeping of the
city. ^{He hurried out at the} While there as investigator of these people,
although he had got to Serrae and might
so that he could go forward from there to the
first narrow of Eubria, he kept his fleet in
position until night, so he might not be seen
rounding the promontory. At first dusk, he
moved, and arrived at Chelbis without incident
slightly before dawn, at the place where the
least frequented parts of the city are and he took
the nearest towers with a few soldiers and he
went nearby with ladders. In some places the
guards were asleep, and in some places there
was no guard, making his way through the
built-up areas, they slew the guard, smashed
the gate, and admitted the large remainder of the
armed force. Thence they spread out through

Antiochus III

0024

the whole city, and the tumult was increased
because fire was applied to roofs around
the market place. Then found also the royal
granaries and army with its extensive
equipment of machines and its particular
cavalry. Slughter then ^{everywhere} ~~was~~ ^{was} ~~by~~
to occur, etc.

orum partem vir, e cuius nomine exstant [Ni?]ΚΗCΛC, f. ΝΙΚΗCΙΑC Testim., possedissee vel administravisse videtur, artem Epigonus.

Nomen phratriae non legitur in titulo, ut deest tit. Attico iam allato, ad quem A. de Premerstein *Ath. Mitt.*

643 Eretria ante agrum Chr. Brakas. Lapis calcarius a. 1,22, l. 0,79, cr. 0,30. In fronte (*cordere Langseite*) litt. a. 0,07 s. IV—III a.

ἄροC.

11.04

MBW
V. 83

IG 12 Supp

III. CHALCIS.

XII 9, 898—1185. 1276—1278.

grammes

— I. CHALCIS VRBS.

DECRETA.

4 (ante n. 898) DIAGRAMMA REGIS. Chalcide in museo. Stela marmoris caerulei, inventa in ruinis castelli in regione 'Ag. ΠΑΡΑΣΚΕΥΗC, inaedificata in cameram subterraneam fort. frumentariam, a. 1,50, l. 0,435—0,49, cr. 0,10. *Litt. pulcherrimae* a. 0,012—0,014 saec. II a. Ed. cum commentario amplissimo S. B. Kougeas *ΕΛΛΗΝΙΚΑ* VII 1934, 177—208. Cf. C. B. Welles *Am. Journ. Arch.* XLII 1938, 251; E. Bickermann *Rev. phil.* 1938, 295. Exscripsi. *Ect.* Vide tabulas in fine huius voluminis.

§ 1 οἱ οἰκονόμοι ἐπιμελείσῳσαν, ὅπως τὰ 5
 ΔΙΑΤΑΧΘΕΝΤΑ ὑΠὸ τοῦ βασιλέωC εἰC τὰC
 ΠΑΡΑΘΕCΕΙC ΔΙΑΤΗΡῆΤΑΙ ἄΦΘΑΡΤΑ· καὶ ὅCΑ
 ΜΕΝ ἤΔΗ ΠΑΡΑΚΕΙΤΑΙ, ὧΝ ΜΕΤΡΟΝ ἔCΤΙΝ, ἄΝΑ-
 ΜΕΤΡΗΣΑΤῳC ΠΑΡΟΝΤῳΝ ΤῳΝ ΦΡΟΥΡΑΡΧῳΝ,
 ὧΝ ΔΕ CΤΑΘΜΟC, ἌΝΑCΤΗCΑΤῳC, ὅΠῳC καὶ
 οἱ ΦΡΟΥΡΑΡΧΟΙ ΠΑΡΑΚΟΛΟΥΘῳCIN ὅCΑ ὑΠἈΡΧΕΙ.
 § 2 καὶ τὰC ΜΕΝ ΚΛΕΙΔΑC ΤῳΝ ἈΠΟΘΗΚῳΝ ἔΧΕ-
 ΤῳCIN οἱ ΔΙΑ ΤῳΝ οἰκονόμῳΝ ΧΕΙΡΙCΤΑΙ,
 CΦΡΑΓΙΖΕCΘῳCIN ΔΕ τὰ οἰκῆΜΑΤΑ οἱ ΦΡΟΥ- 10
 ΡΑΡΧΟΙ καὶ ΦΡΟΝΤΙΖΕΤῳCIN, ὅΠῳC ΜΗΘΕΝ ἔ-
 Κ ΤῆC ΠΑΡΑΘΕCΕωC ἈΦΑΙΡῆΤΑΙ ἔΛΜ Μῆ ΤΙ-
 ΝΑ ΠΑΛΑΙΟΥΜΕΝΑ ΔΟΚῆΙ ἈΧΡΕΙΟΥCΘΑΙ. ΤΑῦ-
 ΤΑ ΔΕ ΑἰΡέCΘῳ ὅΤΑΝ τὸ ἴCΟΝ ΠΛῆΘοC ΠΡΟΑ- 15
 ΝΑΧΘῆΙ. καὶ τὸΜ ΜΕΝ CἴΤΟΝ ἈΝΑΓΕΤῳCIN Ἀ-
 Πὸ ΤῆC ΝέΑC ΠΡΟCὸΔΟΥ ἄΒΡΟΧΟΝ καὶ εὔθε-
 ῳC CΥΝΤΑCCΕΤῳCIN ΔΙΑΠἈCCEIN τῆΙ ΓῆΙ
 τῆΙ ΧΑΛΚΙΔΙΚῆΙ, τὸΝ ΔΕ οἶΝΟΝ καὶ τὰ εὔΛΑ ε-
 ΓΝΕΟΥΤῳCIN ΔΙΑ Πέντε ἔΤῳΝ καὶ ΦΡΟΝΤΙ- 20
 ΖΕΤῳCIN, ὅΠῳC ὁ οἶΝοC ἄΓῆΤΑΙ ἔΦέΤΕΙοC ἠ-
 ΔῦC ΒΕΒΑCΑΝΙCΜΕΝοC. ἐΠΙCΚΟΠΕῖΤῳCIN ΔΕ
 καὶ τὰ CΙΤΟΒΟΛΕῖΑ τῆC ΜΕΝ ΘΕΡΙΝῆC ἔΞΑΜῆΝΟΥ.
 ΚΑΘ' ὅΝ ἂΝ ΚΑΙΡὸΝ ὄΜΒΡοC ΓΕΝῆΤΑΙ, τῆC ΔΕ ΧΕΙΜΕ-
 ΡΙΝῆC ΚΑΤὰ ΔΕΧῆΜΕΡΟΝ· καὶ ἔΑΝ ΤΙ ΡΕῦΜΑ ΓΕ- 25
 ΓΟΝὸC ἦΙ εἰC τὸΝ CἴΤΟΝ, ἐΠΙCΚΕΥΑΖέ[τ]ῳ-
 CΑΝ ΠΑΡΑΧΡῆΜΑ. ἔΑΝ ΔΕ ΤΙΝΕC ΤῳΝ οἰκονό-
 ΜῳΝ ἢ ΤῳΝ ΔΙΑ ΤῳΝ οἰκονόμῳΝ ἢ τὰC CΦΡΑΓῆ-
 ΔΑC ἈΦέΛῳCIN ἄΝΕῦ ΤῳΝ ΦΡΟΥΡΑΡΧῳΝ ἢ ἔ-
 ΞΕΝέΓΚῳCIN ΤΙΝΑ ΠΡὸ τοῦ ἕΤΕΡΑ ἈΝΑΓΑ-

γεῖν ἢ διὰ τὸ μὴ ἐπισκοπεῖν κατὰ τοὺς γε- 30
 ΓΡΑΜΜΕΝΟΥC ΧΡΟΝΟΥC ἔΑCῳCIN ΤΙΝΑ Ἀ-
 ΧΡΕΙΩΘῆΝΑΙ, ἔΛΕΓΧΘΕΝΤΕC ΠΑΘΕΤῳCΑΝ, ὅΤΙ
 § 6 ἂΝ ΑῦΤῳΝ ὁ ΒΑCΙΛΕῦC ΚΑΤΑΓΝῳΙ. οἱ ΔΕ ΦΡΟΥ-
 ΡΑΡΧΟΙ ἔΑΝ ΤΕ ὀΛΙΩΡῆCῳCIN τῆC ΦΥΛΑΚῆC
 ΤῳΜ ΠΑΡΑΚΕΙΜΕΝῳΝ, ἔΑΝ ΤΕ ἔΚόνΤΕC ΠΡΟῳΝ- 35
 ΤΑΙ ἔΤΕΡοΙC, ἔΑΝ ΤΕ ΑῦΤοἱ ΛάΒῳCIN, ἔΝΟΧοΙ ἔ-
 CΟΝΤΑΙ, ὧΙ ἂΝ ὁ ΒΑCΙΛΕῦC ΑῦΤῳΝ ΚΑΤΑΓΝῳΙ.
 § 7 ὅΤΙ Δ' ἄΜ Μῆ ΠΟΙῆCῳCIN οἱ οἰκονόμοι τῳΝ ΓΕ-
 ΓΡΑΜΜΕΝῳΝ ἔΝ ΤΟΥΤῳΙ ΤῳΙ ΔΙΑΓΡΑΜΜΑΤΙ,
 ΓΡΑΦΕΤῳ ΤῳΙ ΒΑCΙΛΕῖ ΠΑΡΑΧΡῆΜΑ ὁ ΦΡΟΥΡΑ- 40
 ΧΟC ὁ ΤΕΤΑΓΜΕΝοC, ἔΝ ὧΙ ἂΝ ΤόΠῳ ἦΙ τὸ ὀΛΙ-
 ῳΡΟΥΜΕΝΟΝ, ὅΠῳC ὁ ΒΑCΙΛΕῦC ΔΙΑΓΝῳΙ ΠΕΡΙ
 τοῦ ὀΛΙΩΡῆCΑΝΤοC, ΤΙΝοC ἄΞΙόC ἔCΤΙΝ ἐΠΙΤΙ-
 ΜῆCῳC. ἔΑΝ ΔΕ Μῆ ἐΠΙCΤΕῖΛῆΙ, ἄΛΛᾶ ΠΡόΤΕΡΟΝ
 ὁ ΒΑCΙΛΕῦC ΠΑΡ' ἔΤΕΡΟΥ ΠῦΘῆΤΑΙ, ΠΡΑΧΘῆCΕΤΑΙ 45
 § 8 ΖΗΜῖΑΝ ΔΡΑΧΜΑC ἔΞΑΚΙCΧΙΛῖΑC. τὸ ΔΕ ΔΙΑ-
 ΓΡΑΜΜΑ ΤΟΥΤΟ ἔΚΑCΤοC ΤῳΝ οἰκονόμῳΝ ἈΝΑ-
 ΓΡᾶC εἰC CΤῆΛῆΝ CΤΗCΑΤῳ ἔΝ τῳΙ ἐΠΙΦΑΝΕ-
 CΤᾶΤῳ ΤόΠῳΙ τοῦ ΦΡΟΥΡΙΟΥ καὶ ΑῦΤόC, ὅΤΑΝ ἠΜΕ- 50
 ΤᾶΓῆΤΑΙ ἐφ' ἕΤΕΡΟΝ ΤόΠΟΝ ἢ ἈΦῆῖΤΑΙ ἈΠὸ
 τῆC ΧΡΕῖΑC, ΠΑΡΑΔΙὸΤῳ ΤῳΙ ἐΠΙΚΑΘΙCΤΑ-
 ΜΕΝῳ ΜΕΤὰ ΤῳΝ ΛοΙΠῳΝ ΤῳΝ ἔΚ τῆC οἰκονο-
 ΜῖΑC ΚΑΤὰ τὸ ΔΙΑΓΡΑΜΜΑ ΤΟΥΤΟ.

V. I οἱ οἰκονόμοι· Cf. 7 οἱ ΦΡΟΥΡΑΡΧΟΙ, sc. ἔΚΑCΤοC ΤῳΝ
 οἰκονόμῳΝ (v. 47) in singulis castellis insulae, in quibus
 hoc ΔΙΑΓΡΑΜΜΑ publice inscriptum est (v. 47). De officio
 oeconomorum cf. Kougeas ad tit. 3 ΠΑΡΑΘΕCΕΙC 'Speicher',
 cf. Syll.³ 344 not. 26. 15 ἈΝΑΓΕΤῳCΑΝ sc. navigiis Chal-
 cidensium. 16 ΠΡόCοΔοC 'Ernte'. 17 ΔΙΑΠἈCCEIN 'be-
 streuen', cf. Strab. XII p. 575 ποιεῖ ΔΕ τὸΝ CἴΤΟΝ ἄCῆΠΤὸΝ ἠ-
 ΧΑΛΚΙΔΙΚῆ Γῆ ΜΙΓΝῤῤῆΝ (de Cyzici portu dictum); K. con-
 fert Cassianum Bassum geoponum II 27. 18 εὔΛΑ· De
 lignis confert K. Philonem Βελοποικῆ καὶ εὔΛΑ ΚΑῦCΙΜΑ ὡC
 ΠΛΕῖCΤΑ καὶ ΝΑῦΠῆΓῆCΙΜΑ ὡC ΠΛΕῖCΤΑ CΤΡΟΓΓῤῤΑ καὶ ΤΕΤΡᾶΓῳΝᾶ.
 21 ΒΕΒΑCΑΝΙCΜΕΝοC· De vino examinando disputavit et locos
 e Geoponicis collegit K. 22 CΙΤΟΒΟΛΕῖΑ· Cf. IG II² 1281.
 De variis sitoboliis disputavit Kougeas 190, qui sibi persuasit
 Chalcide eandem cameram subterraneam in saxo ipso ex-
 cavatam, in qua stela inventa est, fuisse CΙΤΟΒΟΛΕῖΟΝ castelli.
 27 ἢ ΤῳΝ ΔΙΑ ΤῳΝ οἰκονόμῳΝ· Cf. 9 οἱ ΔΙΑ ΤῳΝ οἰκονόμῳΝ

Note also Livy's reference to the burning of the
 royal Macedonian granaries at Chalcis in 200 B.C.
 (Livy 7. 23)

grammatics

χειρισταί et Dikaiomata Hal. 57 ex Pap. Rev. 45, 7 ὁ οἰκονόμος ἢ ὁ παρ' αὐτοῦ καθεστηκός. χειρ. occurrunt etiam in diatagmate Amphipolitano edito a P. Roussel *Rev. arch.* III 1934, 40 (*devait appartenir à l'intendance*). 34 ὀλιωρῶσιν. Cf. 41. 43 et Preisigke *Wörterbuch* s. v. Kougeas l. a. p. 380. 39 ΔΙΑΓΡΑΜΜΑΤΙ. Exempla diagrammatum collegit C. Bradford Welles *Royal correspond. in the hellenist. period* 1934, 324; praeterea cf. Kougeas l. a. 200. Vide etiam Welles et Bickermann l. supra c. 45 παρ' ἐτέροϋ πύθεται. Cf. diatagma Amphipolitanum *Rev. arch.* III 1934, 40 Π 3sq. ΖΗΜΙΟΥΣΩΣΑΝ (sc. milites in custodia dormientes) ΔΩΔΕΚΑΙΟΙΣ ΤΡΙΣΙΝ (i. e. 36 obolis) καὶ ΔΙΔΟΣΩΣΑΝ ΤΟῖΣ ὙΠΑΣΤΙΣΤΑΙΣ, ἔΑΝ ΦΘΑΨΩΣΙΝ ΕἰΣΠΕΜΨΑΝΤΕΣ ΟὔΤΟΙ ΤΗΝ ΤῶΝ ἈΤΑΚΤΟΥΝΤΩΝ ΓΡΑΦΗΝ. De rege summo Macedonum iudice militari disputavit Kougeas p. 192. In diagrammate Thessalicensi de argento in templo Sarapidis legimus: si quis contra legem fecerit, ἔνοχος | [ἔστ]ω τοῖς ἐπιτίμοις τῆς φωρᾶς (cf. Welles l. c. 250¹) καὶ | [τὸ ἀπα]λλοτριωθῆν ἐκ τῶν ὑπαρχόν[των α]ὐτοῦ πρᾶχθῆν εἰς τὸ ἱερὸν | [ἀποκα]τασταθῆτω. 47 ἕκαστος τῶν οἰκονόμων, i. e. Chalcide, Eretria, Carysti, Histiaecae sedem habentium. 49 ΜΕΤΑΓΗΤΑΙ. Kougeas confert Polyb. IV 87, 9 ΜΕΤΑΣΤΗ-ΣΑΜΕΝΟΣ ἀπὸ τῆς χρείας (*Dienststelle*).

De rebus in horreis castellorum servandis Kougeas provocavit ad scriptores polioreticos ut Philonem, qui praeter frumentum, vinum, ligna permultas alias res enumerant.

De auctore diagrammatis, quod in castellis Euboeae publico loco propositum erat (v. 47), nihil dictum est atque constat omnes Macedonum reges inde a Philippo II praesidia in eius castellis atque imprimis Chalcide posuisse (testimonia enumerat Kougeas p. 199). Cum autem litterae tit. pulcherrime scripti prodant a. fere 200 a. Chr. et cum rex Philippus V (221—179) iam a. 219/8 primum exercitum suum per Thessaliam duxit atque inde per Euboeam insulam iter faciens Boeotiam petivit neque desiit per proximos viginti annos bella gerens in Graecia, iam editor de Philippo V auctore diagrammatis cogitavit. Quin etiam ducem illum qui iussu regis diagramma publici iuris fecit invenisse sibi visus est, Apellem, ministrum regis. At ille iam primis annis regis Chalcide prodictionem suam praeparavit coniuratione inter proximos regis comites facta atque teste Polybio (V 26) in mente habebat.

regem qui Corinthi exercitum tenuerit neso gerendo intentus omni committendo bellum incipere posset. Ad hoc ceterum Kougeae aptissimum fuisse videtur. Apellem brevi post coniuratione detentum ita ut vix tempus ei suppeditaverit C. Bradford rex primo itinere anni 219 non adiit, sed facere quales diagramma indicat. Praeterea in insequentibus insulam Euboeam basilicorum in Graecia gerendorum reddidit nomen eius ducis quem Euboeae insulae

898, ὅπει ἂν [βούλωνται] correxit V. Savigny-Stift. 1929, 136¹.

902, supplevi [ἐπὶ ἡγεμόνος --] col.

904 Nunc Chalcide in museo n. 899, a. 1914. Multa supplementa primi editoris A. H. M. in ectypo aut in catalogo Musei (e. g. 1 εἶπεν· ἐπεὶ 2 ΔΗΜΗΤΡΙΟΥ ΧΙΡΟ - καὶ τῶν 6 ἄξιός τῆς πόλεως προ - 8 9 ὅπως τοῖς τε ἐφῆβοις καὶ 10 ἄξιός φιλόνηρον καὶ τοῖς λογομένοισι - 1 ἢ εἰς τὸ γυμνάσιον παραγενομένοισι - ἔτι ΔΕ ΚΟΣΙΑΣ - - ἐπιδόμενος τοῖς ἀλειφομένοισι τοὺς τόκοις αὐτῶν εἰς - - 20. 21 [ΔΕ] καὶ τῷ δήμῳ | ἐπαινέσαι μὲν Χαρίδαμου

905, sq. supplevi e tit. 4, [ἈΛΒΑΝΔΕΩΝ] [ἔδοξεν Ἀλβανδέων τῆρι βουλῆι καὶ [ὑπάρχ]ον[τα] συνγενικὰ δίκαια - - καὶ v. 10 suppl. τεῖ[μια, ἀποσταλῆναι εἰς φων - -]

907 V. 29 καὶ Κατύλλου Κλαυδίου in *helm Anz. Ak. Wien* 1924, 136 Κατύλλου cf. SEG III 772.

645 (post n. 908) Chalcide in museo n. 175, invent. a. 1914 ἐν μικρῇ τινι ὀδῷ παρτετριμμένη. Lapis dexter inferior servatus, a. 0,27, l. 0,21, cr. 0,40. Litterae saec. II a. in sinistra parte lapidis detritae.

[- - - - - ΤΟῦΣ ΣΤ]ΡΑΤΕΥΟΜΕΝΟ[ΥΣ] [ΤῶΝ ΠΟΛΙΤῶΝ - - - - - ΔΕΔΟΧΘΑΙ Τῆρι βουλῆι καὶ] τῷ δήμῳ πρόξε- [NON εἶναι καὶ εὐεργέτην τοῦ δήμου τοῦ Χαλκιδέων - - καὶ αὐτὸν καὶ ἐκγό- [ΝΟΥΣ αὐτοῦ καὶ εἶναι αὐτοῖς γῆς καὶ οἰκίας ἐγκτησιν καὶ] ἄσυλιαν καὶ πολέμο[Υ] 5 [ὄντος καὶ εἰρήνης καὶ πρόσοδον πρὸς τὴν βουλῆν καὶ τὸν] Δῆμον ὅταν βούλω[ΤΑΙ] πρῶτοις μεθ' ἑαυρῶν καὶ τὰ Ῥωμαίων καὶ τῶν ἑλλήνων

Miss VIRGINIA GRACE
 AMER^{School of} School of Classical Studies
 PHOTAREH ST.

Athens.

Kindness of Amy Symbit



HOTEL DIVANI ZAFOLIA PALACE

a divanis chain hotel

19-25 PARTHENONOS STREET-ATHENS 402-GREECE

THE HOTEL IS NOT THE SENDER

1. XI. 82

Modern handling of grain (wheat)
 Zoroastrian in transport.

May 1982

pp. 658-9

"Halfway up a mountain
 of wheat, inspection
 check for insects in
 the enormous terminal
 of Co-operative Bulk
 Handling Limited
 at Kwinana.

Capable of loading
ships at 180,000 bushels
 an hour — "
 (Perth, Australia)

miles of gas

989 5605

5398 (base located)

It was, no doubt, against these raids of the Peiraeus garrison that Kallias deployed his men in order to protect the harvest of the grain (line 25).

In a city which, in the recent past, had been starved into surrender after the siege of 295/4, the urgency of gathering the crops in time of war is readily understandable. The strategic importance of the Attic harvest to the defense of Athens is vividly reflected in other inscriptions in which military officers proudly include among their other feats the fact that they brought in the crops at a critical moment. Thus Kallias' own brother Phaidros reports on his command as hoplite general, in circumstances to which we shall have occasion to return: "And he was responsible for bringing in the grain and the other crops from the countryside" (*IG II*², 682, lines 35-36; Appendix 1). Similarly, during the Chremonidean War the demesmen of Rhamnous praised the general Epichares: [τούς τε σιτικούς καὶ] τοὺς ξυλίνοὺς καρποὺς μέχρι τριάκοντα σταδίων συνεκόμισεν [εἰς τὸ στ]ρατό[πεδον, πύρ]γο(υ)ς [δὲ ἐν τῇ] χώραι καταστησάμενος κρυπτούς, ἐπὶ τὰς σκο[πίας παρεφε]δρεύων αὐτὸς μετὰ τῶν στρατιωτῶν ὅπως ἀσφαλῶς γένηται ἢ [συγκομιδῇ τῶν κ]αρπῶν τοῖς γεωργοῖς (*SEG XXIV*, 154, lines 8-11). Indeed, the anxiety of the city as a whole for the success of the harvest in these same years of war is still manifest in the unique sacrifice for the crops in the countryside offered by the eponymous archon, Nikias of Otryne, in 266/5: ἔθυσεν ἐφ' ὑγείαι καὶ σωτη[ρίαι τῆς βο]υλῆς καὶ τοῦ δήμου τοῦ Ἀθηναίων κα[ὶ τῶν κ]αρπῶν τῶν ἐν τεῖ χώραι (*IG II*², 668, lines 8-10).

Here again the analogous situation of the Chremonidean War serves to illuminate the events of the earlier revolution, and this suggests the extent to which Kallias' timely support was critical to the success of the nationalist cause. But still greater interest attaches to his activities, for they bring to mind at once the involvement in these same events of another Ptolemaic officer, a certain Zenon, who had been stationed in command of a squadron of light cruisers.³⁷ The Athenian decree in his honor (Appendix 9) was passed at the time of the revolt, on Hekatombaion 11 of Diokles' archonship; and there is now general agreement that it is the earliest surviving document published by the nationalist government. Although the crucial passage requires restoration, there can be no doubt that Zenon was concerned with supplying grain to the city. His mission has always heretofore been understood to have involved the importation of foreign grain from abroad,³⁸ and the text of *IG II*², 650, lines 16-19 has been restored accordingly: ἐπιμελεῖται δὲ [καὶ τῆς κομιδῆς το]ῦ σίτου τῶι δήμωι ὅπως ἀ[ν] ἀσφαλέστατα δια]κομίζεται συναγωνιζόμενος τῇ τοῦ δήμ]ου σωτηρία. In the light of the new inscription (lines 25-26), it seems virtually certain that two Ptolemaic commanders, both helping to provide grain for Athens at the same time, took part in

³⁷ *IG II*², 650, lines 11-12: [καθεστηκ]ώς ὑπὸ τοῦ βασιλέως Πτολ[εμαίου ἐπὶ τῶν ἀ]φράκτων; and cf. his activities at about this time in the Cyclades, *IG XII* 5, 1004, lines 2, 4: καταλειφθεῖς ὑπὸ Βάχχωνος τοῦ νησιάρ[χου]... ἐπὶ τῶν πλοίων τῶν ἀφράκτων. Cf. *Pros. Ptol.* VI, 15043; Zenon's position in relation to other Ptolemaic officers in the Aegean has been studied by I. L. Merker, *Historia* 19, 1970, pp. 143, 150.

³⁸ Ferguson, *HA*, pp. 142, 147; Tarn, *JHS* 31, 1911, p. 253; Tarn, *Ant. Gon.*, pp. 92f., 419f.; H. Volkmann, *RE XXIII*, 1959, col. 1627, s.v. Ptolemaios I Soter; Bagnall, *Ptolemaic Possessions*, p. 147.

Archaeology Nov. Dec 1983
Pp. 62 and 75

14.01

In the Field

Milling in Ancient Greece

by CURTIS N. RUNNELS and PRISCILLA M. MURRAY

No less a person than the eminent archaeologist V. Gordon Childe used the humble millstone, otherwise known as a "quern" or "metate," as an example of the simple but necessary tools which, once invented, remain virtually unchanged through time. His observations, which seemed logical to many, became so widespread among archaeologists that surprisingly little attention has been given to the forms and uses of millstones.

Archaeological interest in these implements was also hampered by the notion that the millstone was the type artifact of the Neolithic or New Stone Age, which began in the Near East about 9,000 years ago, and that it was therefore a relatively late technological invention which arose only with the origin of agriculture and the need to grind grain. The mere presence of millstones in archaeological contexts was immediately taken to indicate a food-producing economy.

We set out to test these assumptions in one area of Greece where we studied stratified and well-dated millstones spanning the last 10,000 years from the Mesolithic period to modern times. We discovered that millstones, even those from the Neolithic, were used for many other purposes besides grinding grain, and that contrary to Childe's opinion they were quite variable in shape, use and material through time. These mundane tools are, in fact, valuable artifacts for the archaeologist because they reveal a great deal about ancient technology and economy and can easily be used, like pottery, to date archaeological deposits.

Study of millstones from archaeological excavations as well as from modern contexts in the Argolid, Korinthia and Attica, districts located in southern Greece, revealed continuous change in their form and function through time. The earliest milling tools from the Mesolithic and Neolithic periods (7500-3000 B.C.) consisted of small, roughly ovoid stones averaging only 25 centimeters in overall length. These stones probably remained stationary while smaller hand-held stones were scraped over them in a reciprocal or back-and-forth motion.

Millstones seem to have been used during these early times as all-purpose anvils and grinding surfaces. Because Early Neolithic grains were wrapped tightly in their husks, or glumes, it is probable that they were more easily crushed in mortars than on millstones, and the grains were then consumed as boiled gruel. Because of their association

with other artifacts, it appears likely that grinding slabs and hand stones were preferred for grinding clay and pigments for pottery or coarse salt and edible seeds rather than grains. Grinding slabs were also used without hand stones, and hard substances like shell were directly ground on them. Thick shells were shaped for bracelets, and stone axes and adzes, bone awls and points were fashioned and sharpened. Ethnographic research reveals that these stones are still used this way today in many parts of the world, including Greece.

It is not until the Bronze Age (3000-1100 B.C.) that there is the first evidence for the use of millstones to grind grain into flour for bread. Grinding slabs increased in size during this period, weighing up to 30 or 40 pounds. They are found paired with upper hand stones and so seem to have been reciprocally operated. By the beginning of the sixth century B.C., millstones for home flour grinding had become standardized. The lower grinding slab was well finished and rectangular in shape, and the upper hand stone was boat-shaped with two pointed ends and a spine or keel.

During the Classical period (fifth and fourth centuries B.C.), we see the first major steps toward mechanizing the process of flour grinding in commercial bakeries, where large "hopper mills" were probably used. This type of mill was nothing more than a modified domestic hand mill, with the upper stone enlarged in size and hollowed out to create a hopper to hold grain. This did away with the need to stop the grinding process to add more grain or to scrape off the flour. The hopper mill permitted one person to grind flour more efficiently than would have been possible by simply increasing the number of hand mills.

Classical flour mills were followed quickly by Roman improvements. The round hand mill, or quern, which was operated using a rotary motion, was invented somewhere in the western Mediterranean area for use in the home or by a mobile army, perhaps by the third century B.C. A larger rotary mill known as the Pompeian mill, familiar from excavations at Ostia and Pompeii in Italy, was employed for commercial flour manufacture and was powered by animals or slaves. By the first century B.C., rotary millstones were being turned by water in the first truly mechanized mills, an innovation which quickly spread throughout the Roman world. Windmills were added in the ninth century A.D. and along with the water



mill and rotary querns continued in use into the last century, when they began to be replaced by the steel roller mill.

Stone sources

The materials from which millstones were made changed through time just as the shapes and uses of the tools did. In the Mesolithic and Neolithic periods, two basic kinds of stone were employed: sandstone and andesite. Several different kinds of andesite, a rough volcanic rock, were utilized during these early periods. With the coming of the Bronze Age there was a major increase in the amount of this material employed. Andesite continued to gain in popularity after the Bronze Age, but during the Classical period the range of sources narrowed to two. Beginning perhaps in the later Mediaeval period and continuing to the present, a white metamorphosed volcanic rock replaced andesite as the most common material from which millstones were made.

Where did these various materials come from? Armed with rock descriptions and a few small chunks from archaeological artifacts, we studied geological maps and traveled to likely sources to collect rock samples for comparison. Sandstones are ubiquitous in Greece and every archaeological site has a source of these stones nearby, so the more unusual volcanic rocks were most intriguing.

The maps revealed two major areas of volcanic activity in southern Greece. One was the Saronic Gulf area, including the islands of Aegina and Poros, the Methana peninsula and a small portion of the Isthmus of Corinth. The second area was the south Aegean arc of volcanic islands, including Melos, Kimolos, Thera, Kos, and Nisyros. In our visits to these volcanic deposits we had hoped to find some traces of ancient quarrying activity which would, along with the

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millstone

in 10 on 11 point Baskerville, requiring cerebral as well as physical effort to read. A general audience might find this disagreeable, and could find itself adrift in a sea of involved sentences as Curl breaks his waves of English against rocks of French, Italian and German. Concurrently, the specialist will be astounded at the numerous errors, the most amusing of which, to my mind, is Curl's reference to the beloved numismatist Bluma Trell as "Bloomer Trell." One wonders, therefore, how carefully Curl himself examined the information provided by the "many people" who assembled "the great mass of material that forms the basis of this book." In short, Curl is bookishly Egyptological, simply cataloguing, in somewhat encyclopaedic manner, examples of Western works in which Egyptian motifs can be identified. Rarely does he probe deeper beneath the surface to examine the cultural forces operative on the selection.

Such faults are only to be expected in a work of such scope and ambition. For anyone seriously interested in the Egyptian Revival, Curl's book is a very convenient and important starting point. It does contain a great amount of information which a discriminating reader can evaluate. Scholars can exercise discretion on how they themselves will use this source for their own purposes. The educated public will obtain a broadly penned overview of this fascinating effect of Egypt on our own civilization. Robert S. Bianchi, *The Brooklyn Museum, Brooklyn, NY* □

In the Field

continued from page 63

were made of only two kinds of andesite: one from Aegina and the other from a new and more distant source, Nisyros in the south Aegean arc.

Matching rock samples

We used thin-section petrography to match geological and archaeological rock samples. Sections of rock were cut, attached to a glass slide, and ground so thin that light could pass through them. When a thin section was placed under a polarized light microscope, minerals composing the sample could be identified and the structure and texture of the rock could be examined. When thin sections from two rocks were compared by a petrographer, minute similarities and differences not apparent in hand samples were detected. Rocks from the Saronic Gulf could be distinguished from each other as well as from those coming from the south Aegean arc.

Millstones are sensitive indicators of past cultural change. In the Early Bronze Age, the increases over the Neolithic in the amount of andesite employed and in the distance it was transported can be explained by the introduction of the oared longship, which is seen in the art

from the islands at this time. These new boats could carry heavy cargoes and needed heavy ballast, quite possibly for the first time. Millstones would have fit the bill quite nicely.

Why would Early Bronze Age peoples have wanted new mills? At this time, the new art of metallurgy made tremendous gains in popularity. Bronze and gold became valuable trade goods and were widely accumulated and exchanged by a more wealthy class of people. Evidence from settlement patterns indicates that the population was increasing. There must have been a great demand for labor to manufacture trade goods, buildings and ships and to garrison the fortification walls, which for the first time were necessary to protect the new wealth. It is no surprise, therefore, that bread and labor-saving devices such as millstones would appear at this time. Big millstones would allow one person to prepare flour for many others, and in fact specialist millers may have been required.

In Classical times as well, millstones give witness to social and economic change. There was great demand for labor in this period as well because intensified agricultural production was necessary; population was outstripping the available land. The invention of the hopper mill allowed more efficient grinding of flour and freed laborers to work elsewhere.

Why did Mediaeval millstone makers not continue to use andesite for hand mills, instead breaking with 9,000 years of tradition and switching to the white stone from Melos? It appears that knowledge of Classical Greek and Roman millstone works was lost with the Slavic invasions of the Early Middle Ages. With the introduction of the windmill, which is thought to have been in the twelfth century A.D., prospectors sought a lightweight but durable stone for these new machines and found the glassy vesicular stone on Melos. The new windmills were quickly adopted in the arid Greek islands where there was no water power. Smaller hand mills for home use were made by the manufacturers of the larger mills. It was probably easier to buy these white querns than to make them, even for use in the home, and so Melos stone became common even in those areas with ample andesite deposits.

Historians of technology have pointed out that many of the most valuable inventions vital to the industrial revolution were made first in milling technology. The presence of commercial bakeries in Classical Greece was the first step toward mechanized factories. The Roman rotary quern and water mills and the later Mediaeval windmills are also important industrial precursors. It is ironic that these innovations have been largely overlooked by archaeologists who have seen millstones as unimportant, when millstones actually were pivotal elements in the history of technology. □

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**HELP
WANTED:**

(To interpret and date this artifact, the Seaton Amulet from Co. Durham, England.)
Send in your suggestions!



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K. Kouremenos and J. Travalos,

Δελτίον 15 1933/35 [1938]

on grammar?
pp. 79-82

G. E. Mylonas, Eleusis and the Eleusinian
Mysteries, Princeton 1961

Look up anything about
pre-Roman grammars.

note 24
9765 j. 1. 77
Hesp. Supp.
p. 134

Ancient Dam

See William B. Murray, "The Dam below Glosses," abstract for 1981 Xmas meetings, AJA 86, 1982, p. 279.

Glosses is a medieval fortress in western Akarnania. Dimensions are given of this large dam built into a defile, also details of its construction. A "4th cent. date" is proposed. Well, I suppose AD, as nothing is said. "Apparently a failure" Later changed use. "Dissimilar from the Trojans dams, the dikes of the Copaic basin or Arkadia, and Roman dams in Israel, Tripolitania and Spain, the dam below Glosses is a unique and important monument."

more granaries

G. Cadogan, review of R. P. Willalls, The
evolution of Ancient Giza, London 1997,
see JGAS 1982, p. 198: "The
round buildings at the South West corner of
the palace of Mentiu are probably not cisterns
(p. 65, fig. 7) but granaries."

GRANARIES

American School of Classical Studies
54 Swedias St.
Athens, 140 Greece

September 1, 1982

Dear Mr. Lock,

I'm sorry to be so slow in acknowledging your excellent photos showing Roman granaries in Hadrian's Wall. As you know, I am at the moment intrigued by ancient granaries, and delighted to have these pictures.

In your letter (of May 21st) you mention possibly coming to Greece in August. I do hope you would have let us know if you did come. It has actually been too hot for comfort.

I venture to wish your wife "Good Delivery!" as people do here-- even to a woman they don't know, just seen on a bus. Our little Anna is at the Stoa daily with her mother, and made much of as you can imagine. Margot sends you best greetings and wishes for the baby, and she said to tell you that "everything about a baby is good, even the bad parts."

Yours sincerely,

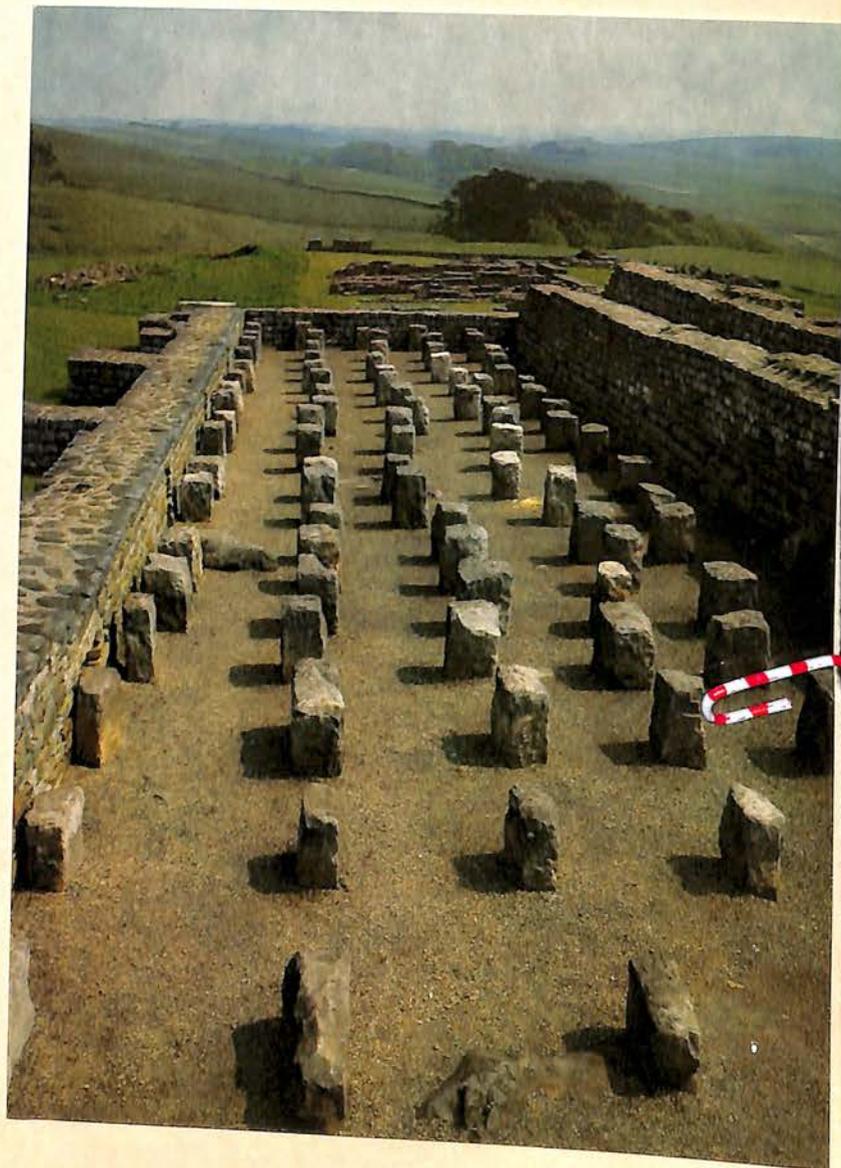
Virginia R. Grace

VG/oz

19,01



GRANARIES ON HADRIAN'S WALL
with etc of 21.7.82 from P. Lock

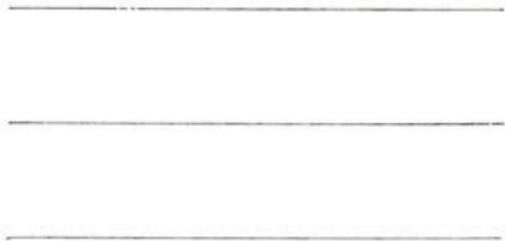


GRANARIES ON HADRIAN'S WALL
with etc of 21.V.82 from P. Lock



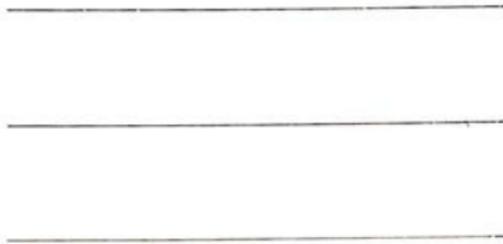
- P.3. Corbridge Roman Station, Northumberland.
The Granaries from the north.

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Printed in England for H.M.S.O. by The Campfield Press, St. Albans.





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Printed in England for H.M.S.O. by The Campfield Press, St. Albans.



P.4. Housesteads Roman Fort, Northumberland.
The North Granary from the west.

CORBRIDGE ROMAN STATION: HADRIAN'S WALL

Department of the Environment

Set 4/55

19.04



DEPARTMENT OF
THE ENVIRONMENT

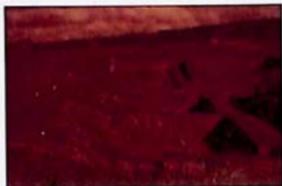


300. Hadrian's Wall, Northumberland:
Narrow Wall on broad
foundation at Planetrees.

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312. Corbridge Roman Station,
Northumberland.
Remains of Military Compounds.

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THE ENVIRONMENT



615. Corbridge Roman Station,
Northumberland.
The Granaries from the north.

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THE ENVIRONMENT



714. Corbridge Roman Station,
Northumberland.
The Corbridge Lion.

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Tel. 39662

~~sent~~
ad.

146 Albemarle Road,
York,
YO2 1HB

19.05
21st. May, 1982.

Dear Miss Grace,

Here as promised are two photographs of Roman granaries on Hadrian's Wall and a set of slides, one of which shows a granary on it. I hope you like them. I took a party of students along part of the Wall yesterday. The weather was fine and the trip a good one. I have enjoyed the amphora pamphlet very much indeed. My students find it a very useful introduction too. Many thanks once again.

Here in England, my wife and I are very happy, since we are expecting our first child in November. I am hoping Joan will be well enough to come to Greece in August. However, we must wait and see how she is and how she thinks she can cope with the heat etc.

Please give my best wishes to all your colleagues at the Agora. I very much enjoyed my days with you all. I hope you are still eating British jelly-beans and that Margot and baby Anna are doing well.

Again many thanks for your kindness.
My best wishes to you all
Peter Leah

GRANVILLE

American School of Classical Studies
54 Swedias St.
Athens, 140 Greece

August 27, 1982

John S. Pillsbury, Jr.
930 Dain Tower
Minneapolis,
Minnesota 55402
USA

Dear Mr. Pillsbury,

I find your letter written last September (23rd), and fear it was never acknowledged. I want to assure you that the information I had from both your very short visit at the Stoa and from this letter has been much valued and referred to repeatedly, as I have been trying to write something short but sensible about the storage of grain.

I was so glad also to find somebody else who remembered Henry Crosby.

Do please let me know if you plan to come again to Athens.

Yours sincerely,

Virginia R. Grace

VRG/cz

October 4, 1981

Dear Doreen,

Thank you for your note of Aug. 31 in a letter to you from R. M. Frame III, Ph.D.

We had a call from Mr. John Pillsbury, who took the trouble to visit me although he had hardly any time in Athens. He had understood I wanted information on amphoras. He had not had time to collect very much yet. So I gave him my Picture Book, revised edition.

He did know a great deal, of course, about storage of grain and flour, but we had madly too little time for me to extract it from him. He must ^{have corrected} ~~have corrected~~ my views on ^{these} ~~these~~ matters a bit. I hope I have also somewhere a few notes taken that day. Maybe he will keep in touch.

I said my acquaintance in this line was with the Crosbys, and he said, while they were competitors, they were also good friends. He had known Missy, also her brother Henry, whom I liked very much (killed later in a plane crash).

It did enter my head that you had hoped Mr. Pillsbury might help us out a bit, but we ignored any such possibility while he was here.

Best of luck in your good efforts on our behalf. So sorry about the bad publicity, so inconvenient for you and Betsy, connected with the Poikile; but I think the situation is not so bad, anyhow by this time. It seems that the ~~offensive~~ letters to the Director was much milder than the paper suggests.

official

JOHN S. PILLSBURY, JR.

930 DAIN TOWER
MINNEAPOLIS, MINNESOTA 55402
612 • 338-4382

September 23, 1981

Miss Virginia R. Grace
American School of Classical Studies at Athens
Agora Museum, Stoa of Attalos
Athens, Greece

Dear Miss Grace:

My wife, Kitty, and I thoroughly enjoyed our visit with you at the Agora Museum on our last morning in Greece. As I think we told you, we had the extra few hours because our plane departure was delayed and the visit with you certainly capped off a wonderful trip for us. We thank you also for the booklet on amphoras which you gave us. We have found it most interesting.

During our discussion we found out from you among other things that grain apparently was not transported in amphoras. Doreen Spitzer was wrong on that. You did however indicate an interest in grain and granaries, and while I tried to speculate on some answers to your questions, I have now had an opportunity to check further.

First you asked whether grain elevators were always cylindrical and why. Most of the more recent ones apparently are cylindrical because it is the most economical and efficient way to construct them, both from the point of view of strength and because the cylindrical shape lends itself well to steel sheet and concrete construction.

Older elevators apparently were built of wood and not all of them were round. Some of them were round, constructed with the planks running up and down using the same general technique as is employed in making barrels.

Unless grain is absolutely dry, which it seldom is when it comes in from the field, it must be turned over from time to time or it "heats up" and can become moldy or sour. If it can be kept dry, apparently it will last almost indefinitely. I have learned that grain in perfect condition was found in some of the ancient tombs excavated in Egypt.

This is kind of a rambling commentary and I hope it answers some of the questions you had. If you have any other questions, please let me know and I'll try to get answers.

Again, thank you. I am going to write Doreen Spitzer and tell her what a pleasant visit we had. Best wishes from us both.

Sincerely,



JSP:bp



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Aug 31

*Dear Mart - is it vaguely possible
that this gentleman could be of use to you?
Hope so - love Green*

20 August 1981

*address to
my letter →*

Mrs. Lyman Spitzer Jr.
659 Lake Drive
Princeton, New Jersey 08540

Dear Mr. Spitzer:

I am writing to you regarding questions in your letter of July 16 to Mr. John Pillsbury. Mr. Pillsbury asked me to contact you because of my interest in the history of flour and grain milling and thought I might be able to discuss with you the subject of granaries which you mentioned.

While my academic interest happens to be the history of modern milling, I am a bit familiar with other aspects of milling history and would be interested in hearing in more detail about your friend's work. Then, perhaps, I would know whether I would be helpful to you or not. Depending on the exact nature of the research, I might be able to recommend someone else whose own research interests were closer to the matter.

In a phone conversation today, Mr. Pillsbury commented that he himself will be in Greece shortly and will be looking into the subject of amphoras firsthand. When he returns we can discuss historical granaries together.

I am hoping to hear from you in the near future.

Sincerely,
Robert M. Frame III

Robert M. Frame III, Ph.D.
Architectural Historian and
Research Historian/Survey
State Historic Preservation Office
(612) 296-9074

RMF/sl

cc: John S. Pillsbury, Jr.
930 Dain Tower
Minneapolis, MN 55402

17 July 1981

20.05

Dear Mark,

Had a thought.

Aleko Papalexandris is the owner and operator of the mill at Itea. He is a cousin of my Trenton Greek friend of the last 35 years, who helps me do my March 25 party every year, whose name is Xenophon Mikroutsikos. I met Aleko in 1965 ^{in Itea,} a very charming fellow, and he just might be knowledgeable about granaries! In case you could try him, mention this connection.

οτι καλο

Doreen

659 Lake Dr.
Princeton NJ
08540



20.06

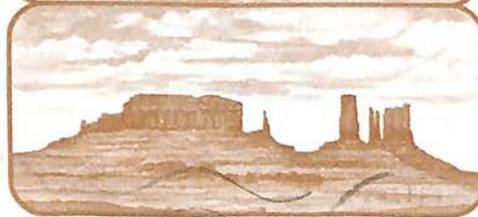
**Tour
The
United
States**



Virginia Grace
American School of Classical Studies
54 Soudias St.
Athens 140
GREECE

AEROGRAMME • VIA AIR MAIL • PAR AVION

② Second fold



See the U.S.A... vacationland of the world!



Additional message area

USPS 1980

Flour mill

including water mills
& note on DAHS

Refs for As W Parson, Hist 1936, p. 76,
note 2, both ways:

L. Lindet, "Les Origines des moulins à grain",
Proc. Acad. XXXV (1899) pp. 413-427, and
XXXVI (1900), pp. 17-44 (water mills, pp. 35 ff.)

But AWP says, p. 89:

"The earliest σπάδης of
which we hear, that of Mithradates, at
Rabeis in Pontus' [Strabo XII, 3, 30] was
doubtless not very different from ours."

maybe there were ^{also in Greece} large-scale mills
that did not go by water? i.e. by bullocks?

⊗ Vid., in De Ingeniis U. Dant.

^{Vitruvius} Engineer under Augustus, but "his output is
essentially Hellenistic" and his treatise is compiled
partly from Greek sources (Hemmergen, etc.)

15.VI.81

21.02

MI 38

MILLS

L. A. Murty, Grain Mills and Flour in

Classical Antiquity, Oxford 1958

6.V.80

(from M. Katz's letter to J. Bass contents of articles; M.K. is interested in millstones)

10.V.80

Cited also in Hama III;

(Nothing in this about granaries.
Is there something about water mills?)

23.VI.81

See SEHAW index under "Water, mills," pp. 364-365 under "Water-mills" Greek inscription in Ptolemy's connection with the palace built by the great Mithridates. In and Ptolemy also called Hydrulatis and is descr. by Vitruvius and Pliny. See refs. pp. 1405, note 159, = cf. p. 1645.

Dear Mrs. Weinberg:

Miss Grace has asked me to answer your ~~recent~~ note, as well as to thank you for your recent letter to her. She was

F. Smith II.81

22.01

Companion used for distributing grain in Puerto-Ricoh TV cutting. Agent Pqmo 39 XXXIV

the news and photos ad the letter with

Try Judoich

), July 6, Miss Grace

is leaving (for America, to consult with doctors. Her address ~~at~~ there

is :

~
~
~

Sincerely,
CZ

v F. Smith II. 81

22.01

Compeion used for
distributing grain in
Pseut - Demost 15 cent
Agent Pope

39

~~XXXIV~~

Try Judoct

Dear Mrs. Weinberg:

Miss Grace has asked me to answer your ~~recent~~ note, as well as to thank you for your recent letter to her. She was delighted to have ^{the} news and photos of Susie's recent wedding.  The Ina memorials also read the letter with great pleasure.

On Saturday, July 6, Miss Grace is leaving for America, to consult with doctors. Her address ~~at~~ there

is:

~
~
~

Sincerely,
CZ

GRAIN
supplies

Athen

Law Decree: Taxes - Tributes
must taxes in Ptolemaios. (29)

I.38.2), Ptolemaios
(IV.42) all show Athen
Athenian law requiring
to divide of the grain
indicates that there was
not, Ptolemaios, 51.4...

GRAIN
supplies

OAU notes on grain in Athens

B. E. MacDonald, "The Phaleron Decree: Taxes & Tributes,"
Herpa 50, 1981, p. 143. Transit taxes in Peiraieus. ⁽²⁹⁾

⁽²⁹⁾ The comments of Thuc. (II.38.2), Xenophon (Parsi III.1-2) and Isokrates (IV.42) all show Athens to be a center of trade, and the Athenian law requiring merchants to send at least two thirds of the grain to the Peiraieus up to Athens indicates that there was a large re-export business (Aristotle, Politics, 51.4...)

Grain dealings in Alt

Post. SEHW pg 629 ff.

See Ling, 43, 6, 2-3. State U.S. in 17/

B.C. the Ptolemies decided for Alt to deliver
 of 100,000 medimni of grain. The Alt...
 finally yielded. The Ptolemies... "certainly"
 knew that large amounts of grain were stored at
 the Ptolemies and that the control of the grain
 had ^{rested} in part with the merchants of
 Alt.

would does
 not appear
 no more

(i.e. i)

- Alt

"husband" - weight

Grain supply - Athens

See J. McK. Camp II, "Grain Inscriptions," Hesperia 1974
pp 322-324 on Proxenus for Socrates of Akragas,
(I ^{Agon} 7178), who brought grain (σιτος) to Athens. John
suggests a date 331 to 324 BC, time of grain shortage at
Athens. Socrates is invited to draw all the provisions.

He cites, for bibliography on the famine, J. Peziris, The Famine
for the Grant of Entertain in Attic Inscriptions, Prague 1966, pp
70-72.

^J
He also
also account - Demosthenes, XXXIV (vs. Phormio), 37, 39,
on the famine, the rationing and the state measures to
ensure supply.

SITOPHYLAKES

Ten sitophylakes of Aristotle's time were to 35 by the
 $\frac{2}{2}$ of the 4th cent - more to be done, provided - regulated: Att.
Pol. 51, 3

Other refs for grain for Sicily [Dionys ^{Zanollari} XXXII and
 LVI (Dionysodoros), 9. a colony sent by Athens to
 Achaia 325/4 in part for grain] But "most of the
 known supplies came from the Black Sea and eastern Aegean."

p. 324

Famine in Athens, and the grain trade

John Camp told me today he is writing for the
HAT festschrift about the famine in Athens in the
4th cent. B.C., ca 314 I believe. Grain
sent to Athens from abroad at this time. I
asked if there was an assemblage as yet on
this subject, and he opens for me Herzf. 1974,
p. 322, his own article, of which I feel I have
an offprint. [It seems so.]

Try to study this, and cite ^a material here,
to see if one can glean anything about how the
supplies were stored.

⊗ E.g. Demosthenes XXXIV (vs Phormion), 37, 39.

13.V.81 [24.02]
19.V.

Fd 025.5
← out around of Philo
J. Jeppson Parabryozoa, Three
mid-joints center, main works of Helene
architectural recesses (Aarhus 1958) Sc
pp. 74-75, figs. 58-59

Fascinating, makes the text books read.

24.08
STOREHOUSE

put in order

13.III.86

40x65
me XIII; "That the way to construction
seems, when the corners of the cells are laid,
joints between the ashles open where the
& shall die." "

CI
145/80

F. Noack, Fleuss, 1927, pp. 189ff.

only with
J. B. ...

24.V.81

[But I did see it, with N. W. ...'s help.

It is funny shape, due to being squeezed in
among other things. I could not remember what
was to be noted about it. Not prehistoric, sure.

and see a Harappa (A. ...)
M² 10

24.01

STOREHOUSE

put in order

13.11.86

01:1

13.V.81

[24.02]

19.V.

← out around 5 Philo

Fd
025.3

f. Jeppson Parakegnath, Three
mid-joint center main works of Helene
architectural reconsidered (Aarhus 1958) See
pp. 74-75, pp. 58-59.

Fascinating, makes the text books read.

p. 73 under XIII; "that the way to ^{40x05} ventilation
is to ascend, when the corners of the walls are laid,
leave the joints between the ashlar open where the
architect shall direct."

C1
145/80

R. Woods, Florus, 1927, pp. 189 ff.

out with
J. Bunt
3.4

24.V.81

[But I did not, with N. Winter's help.

It is funny shape, due to being squeezed in
among other things. I could not remember what
was to be used about it. Not preliminary, say.

and see a Haroff (A. Reiter) ^{M₂ 10}

See also p. 2.

Mazgartin granary

AJA 64 1960	130 - 131	Sjøqvist + 200 plates
65 1961	277 - 278	Stillwell

This bldg is on a ledge and against higher ground, but its back wall is free of the scarp behind. This back wall "had once had a thick coat of waterproof slucco." Outside? Don't say. "No found drainage channel" but soil porous, and "sufficient space left between the bldg and the scarp of the hill to give ample drainage." (AJA 1961)

AJA 1960: Key position down T. Planned size, structural testimony. Finds no II. Some utilization: public structure. Proximity to city gate and to agora. Store and distribution. Ho. of. arsenal of Philo. "Mazgartin seemed as the main depository for provision - supplies of the Roman army in 214 B.C. when it fell into Carthaginian hands (i.e. *ubi fortissima fragmenta magna vis* - lines 24, 36, 10)." But pre-Rom. "Tribus Hieronica (line - - -) which was a tithe tax on agric. products and mainly on grain, used large well built

(2)

(5.8.81)

24.05

public stonework mandatory." (for long
gallery - like of spotlight - Ron hovers a
square block around an open courtyard, to colours,
cojors

16. 8.81

Note that Shelly Stone was here recently,
to whom I had given info ^{in ca 1979?} as SAH at
Morgantina, in connection with the date of
a shrine. He came and talked with
me, and afterwards had tea with us, and I
asked him, what about the granary?

It seems there is now a second granary,
also near the gate. I wish I had taken
note that day. The middle of the floor
came up, and Dick Niddals said yes, what
about a raised floor? and I asked him what
he knew about raised floors for granaries, and
of course it goes back to them in Britain, one
should count on British archaeologists
knowing about this

G. RICKMAN

M2 10 G. Rickman, Rome Gravels and
Stone Bldgs, Cambridge, 1971

On Harappa:

M. S. Vats Excavation at Harappa
Delhi 1940R. E. M. Wheeler, The Indus Civilization
Cambridge 1968ibid., Civilization of the Indus Valley
- Beyond, London 1966

11.V.81

(I surely keep somewhere
some other notes later for this
& get earlier.)Yes - 1.V.81
now here

Strabo's desc of Cyzik = its long straitness; XII. 8. 11, p. 571
(SEHAW, p. 820) Livy in Rome
Cura v Amasea, Pontus. Egypt
Amasea

PMW got
for Oxford
class

53

Postscript, p. 630

Strabo, Geography, Lond vol. 5,
(NY 1928) 12. 8. 11 "Joint
article of Heron in charge of
... out of 3 in charge of Oxyrrhus,
Chios d'inscriptions de Delos

54

Durochoris, Chios d'inscriptions de Delos
Paris 1921 pp. 97-105, no. 73
is dated 172/1
Further redating of the Athenian market,
see W. B. D., The Athens of Athens in the Hell. Age,
Cambridge, Mass. 1931, p. 260; and
S. Dow, Zeitschrift, 14, 1935, p. 71
I am indebted to Mr. R. H. Allcock and John
Trull for references, and for the information
that 160/159 still stands.

Τὸν μὲν οὐδὲν, τὸν
ἐπέγραψεν, τὸν δὲ ΣΙΤΟΥ
... τοῦ μνηστῆρος
(Καὶ τὸ γὰρ περὶ σπῆρας ἢ
μνηστῆρος, γὰρ ἡ Χαλκιδεὺς
ἐστὶν.)

Inscr. - Gr. - Rome

Q 9
076

Ref. for Inscr. in Rome, p. XII

about 3 - 4

1. 1. 81
Dist. with first
anything on this
July 1935
W H

BCH 1934 through on Haspels dig.

Livy 43, 6, 2-3 (ca 71 BC Rome)
summed 100,000 (medium) of corn
for Athens
no word

S 99/L 14
(Lond)

V E O

30. IX .81

GVEP

G. Kleins, Die Ruinen von Mittel, Berlin,

1968, pp. 119-121

Archibol ^{for grain} ~~for grain~~

p. 120 No windows

"Die Tür führte hier von der Westseite

her ins innere,

Dem [i... p...] - in etwas weingsten -
das Innere in das Man ^{man} ^{aussehen} ^{durch} durch Holz-
^{luren} luren gelangte, wie z.B. im Süden

QG
076

F. Fohr, Hellen von Gaebrungen, ^{ant} ^{other} ^{oll},
Inskription von Traus, Berlin 1906

p. XIII (int)

cf. p. 28 under no. 19, l. 6-8

Φρασεολογίας ἐπι... Πρωτόρχου
τῆς τριτάτης τετραμύρου

M210

G. Richman, Rome Granaries and Store Buildings (1971) (for Caesars, the Arch. Doc. of Stone, p. 11, note 11)

(Notes on floors.)

They seem to be all HORREA.

Very important ones from ST OSTIA.

p. XVIII

Worked military granaries of the early AD.

"Historical and legal aspects of warehousing"

p. XX

"If the need to convert plant I, in my turn, has said in this book stimulates new interest in horrea and the many problems connected with them I shall be satisfied."

Bldg for storage of cereals must be "well placed - in case of access, wide adequate space for loading - unloading, and completely secure."

Must be dry, cool, free from vermin

If loose as in bins, walls "must be capable of supporting considerable thrust". Lateral pressure is ca 2/3 of vertical pressure.

In the military installation, granary along a long, narrow, rectangular bldg, strongly vaulted, battened if in stone, with raised floor under which a freely flowing current of air was created by means of ventilation ducts in the walls. Pre-Roman: 5 Halls in Perugia, of similar proportions with raised floor & ventilation, 283-261 BC; and 12 granaries, immediately

Horrea?

p. 2

WED

Stomatopus or callis Aysopus
(papuzi, Stabo) or Tapirator (J. Coulter 1976, p.11)

Date: Ridam, p. 2, says 283-261030

CS
76/10

A. von Szalay and F. Boettlinger, Die Hellenistischen
Arseuale, Alt. von Pergamon, X, Berlin 1937

p. 8, descr. A) cross walls in foundation, also holes
which were for ventilation, not drainage, because the
openings in the outer walls are higher than those of
the inner walls.

assumed wood since big span(?) and no big pieces of stone
must have been heavily load, scary stone

cross walls are lighter, and low strong.

20p. p. 22 on the floor

p. 24 $\delta \iota \epsilon \kappa \pi \nu \sigma \alpha \iota$: in both inner and outer
walls (of foundation) are openings of
various sizes to let the ^{als Luftdurchlass} air through & keep
the floor dry

p. 25 (there is also the $\pi \epsilon \rho \iota \sigma \tau \alpha \rho \iota \varsigma$ against
damp)

Purpose of bldgs.: are the granaries (or arsenals,
etc.) Cites 115 in England, etc. (Not
in Judea Valley) (also a structure in

Eleusis F. Noack, Eleusis 1927 pp. 189ff also
Milet magaz., but says, not the same,
as no schwebelenden Fussboden.)

See Problems, pp. 25-30

FI 16

"magnesian tiles"

See J. J. Coulton, The Architectural Development of the Greek Stoa, Oxford 1976

Review!

JHS 1978,

pp. 207-8

by R. A. Tomlin

Lots of bits. See index and Millett
See p. 11, mention of grain being sold in
stoa, etc., etc. (refs.) - "normal" for stoa -
room, of grain or anything else, was a long deep hall.

p. 24, on draughts vs. light (when you
don't use glass)

text on note 16 - mention by Zenon more understandable
in a stoa w. room behind the colonnade
hall

p. 73 Middle Stoa (see also pp 116-117)

cat. with refs.: p. 221

He says, dated to ca 180 by "pottery, coins, etc."

Indus valley bibliography
for Archaeology 1981, p. 24

~~ASCS Lib.
not in
ext~~

FAIRSERVUS,
W. A. Fairservis, Proto of Ancient India, Chicago, 1975

~~check
of
book~~

J. Jacobson, "Recent Developments in South Asian
Prehistory and Protohistory", in B. Siegel, ed.,
Annual Review of Anthropology (Palo Alto, 1979)

~~check
of
book~~

G. L. Possehl, ed., Ancient Cities of the Indus
(New Delhi 1979).

G. F. Dales, "The Mughal Massacre at
Mohenjodaro," Expedition 6 (1964): 36-43

Be 85.3
small book
keep up!
check
of
the
book

The Indus Civilization, suppl. vol. to
Cambridge History of India (Cambridge, Eng., 1968)
of pp. 129-134 on the massacre (3rd ed)

24.VII.81
ASCS

p. 35 "In the Tigris - Euphrates Valley all the important
cities possessed granaries, apt of considerable size."
These are texts from the network

24

p. 44 in journal at M.-D. "outstanding massive cists,
careful vaulting, and its own provision of leading-facilities

(24. VII. 81)
Wed.

24.15

from outside to citadel is a significant element in the
citadel-plan.

CT 285/10 Mohenjo-Daro and the Indus Civilization
Joe Marshall at. Lond 1931
3 long vols. (B. C. 1931) called
Mohenjo-daro (cf. Bibb, p. 16)

see if ASCS library has anything on this
site in the 2nd millennium B.C., i.e.
architecture, - the municipal granary.

Bibb?

"Brick grouting floors, when ^{MUNICIPAL} municipal
workers poured the grain to the floor - which
payment is generally made

There ought to be something of
document. Publ. later than 1931? How
recent finds?

CS 117/10
00117/10 Melchor

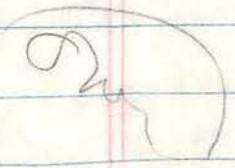
24, IV 81

~~90.2~~ (guide)
Joh. Klein, Die Ruinen
von Melchor
Biele 1968

CS
117/40

Φ.119 No. 11 Des gross. Speicherbau
[speicher = granary, warehouse]

2 arches - pillars - door - MS 117
163.40 long 17.50
13.40 broad
No windows
No door
Walls half-colum on post, 6 ft up
Dome
except tall
few monumental things for
post. us.



Trips - Hall,

Change in level for on dist. & fill
- water well is a low well
partly

Monstrocity

Partly for strong Gutride
[a corn grain]

Notes on Agave XIV [1972]

and SEHAW

p. 29, note 5: "S. J. S. Boonoma, Altin
Bull., Poling of 561/0 to 485/4 p.c.", Geneva
 1970, (But too early)

Looking up
 "grammae"

SEHAW pp 1286-7

"Coin in Egypt was

almost an equivalent of money. Banking was
 extended to dealing in coin. The government's grammae
 (Ayoaupo), scattered all over the country and inherited
 by the Ptolemies, were transformed by them into a
 network of coin banks — managed by a special
 staff (^{οι το δαξοι} or το δαξοι — the subordinates) who had the
 same functions as the bankers; that is to say, they
 received taxes & rents paid in kind and effected
 payments to coin for the government & grammae on behalf
 of the State — like the bankers, they acted as agents
 for private persons."

For ^{Ayoaupo} structures as banks, see p 406, with
 204,

Have looked up "structures" also. Do
 not find any info. or suitable construction of
 grammae or structures.

On the place of the municipal granary
in the center of a city

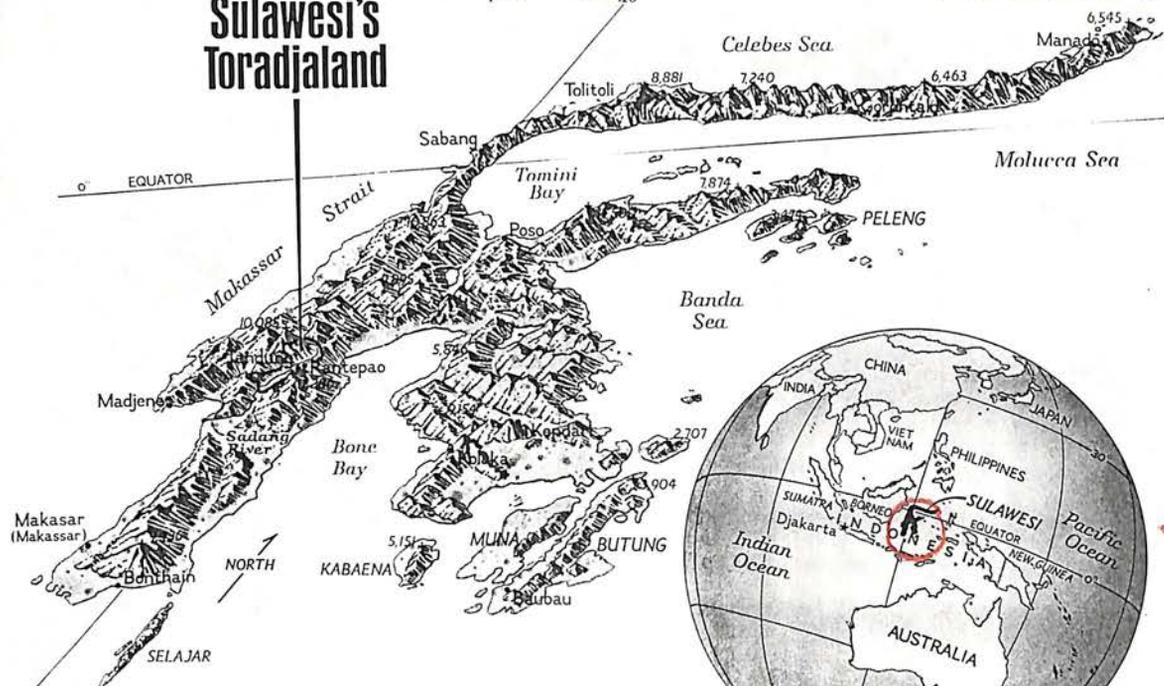
See Geoffrey Bibby, Four Thousand Year Ago,
N.Y., 1961, p. 16: (refers to surveying up on
ropes to the granary floor above - this, of. W.B.P. jr's
objection that there is no level entrance for
grain to the Mill Store) The grain is not
merely a prod. reserve. "It is the universal medium of
payment, and the granary is national bank and
state ^{revenue} ~~income~~ dep't in one, and therefore has its
natural place in the citadel."

GRANARIES

(This number also has Aphrodisias)

IN INDONESIA

**Sulawesi's
Toradjaland**



Elevations in feet
DRAWN BY LEO D. ZIDARTH
COMPILED BY GEORGE W. BEATTY



Water buffaloes loafed while egrets studied them. Everywhere we went, the rumble of rice pounding resounded like thunder, as women hulled grain in wooden mortars shaped like canoes.

One market day we rode on horseback up one of Toradjaland's highest mountains.

"Selamat pagi."

"Selamat pagi," we returned.

The pretty barefoot girl who had bidden us good morning smiled shyly and continued on her way. She carried a five-foot length of bamboo filled with *tuak*, the mildly fermented juice of the sugar palm. Later, at the market, the *tuak* would contribute substantially to the joviality of the Toradja men. Vendors dispense the liquid in thin, short lengths of bamboo, the island's version of disposable paper cups (page 807).

Farther up the trail, in a shady oasis of sugar-palm trees and bamboo, we passed a newly painted Toradja house, handsomely decorated in black, orange, white, and yellow. Facing it stood several rice granaries, smaller versions of the house, and like it, elevated on stout wooden pilings

We paused to study the house's ornate facade. The carved wooden head of a water buffalo—symbol of Toradja wealth—was attached to it. Below the painted white head ranged a set of panels depicting entire buffaloes, some black, some spotted. The Toradja rank buffaloes rigidly, basing their evaluation on color. *Bonga*, piebald buffaloes, are the most valuable, worth ten to twenty times the price of an ordinary black animal.

Bamboo Roofs Shed Monsoon Torrents

From a distance the roof of the traditional Toradja dwelling resembles an ark floating in a sea of tropical foliage. The eaves curve upward, like the prow and stern of a ship, projecting dramatically beyond the ends of the house. Interlocking layers of split bamboo covered with flat strips of pounded bamboo form the roof and act like a thousand sloping gutters to keep the house snug and dry through torrential rains.

Rain! We had blithely ignored the graying clouds hugging the peaks, though we knew that the annual rains were overdue. Even the three soldiers who rode with us—"a safety

canopied four-poster bed, carefully made up with embroidered linen.

The next morning, in a world fresh washed and glistening, we learned the history of the bed on which we had slept so luxuriously. A year before, a Czech geologist had stayed with this family for several months while prospecting for copper in the mountains. Wedded to his comforts, he had brought the bed with him. When he departed, he left it as a gift for his host, never considering that the farmer and his family preferred their reed mat and hard floor as strongly as he preferred his European bed.

A Lesson in Village Economics

"*Kurre sumanga*," we said to the farmer. "Thank you." We bade him good-bye and walked with his wife toward a rice granary.

With a basket on one arm she started to climb the short ladder leading to the granary door. In a flash all the chickens and ducks in the vicinity converged below her. Here was a nice lesson in economy, for as she opened the granary door and began to fill her basket with bundles of rice, many grains unavoidably spilled and were picked up by the ravenous poultry. Chickens and ducks, the lesson goes, are an efficient way to convert spilled rice into eggs and chickens and ducks.

The following day we found ourselves in front of another lovely Toradja house, also freshly painted. The *tongkonan*, or family home, had just been refurbished as a memorial to departed ancestors, but a living one, since the family would continue to occupy it. We had been invited to a feast to celebrate the joyous occasion.

We joined the family and their guests in the rectangular plaza before the house. It was a large crowd—the people of nearby compounds, local government officials, foreign diplomats, journalists.

Brightly colored bunting hung from the granaries and temporary guesthouses that surrounded the plaza. We took our places on a second-story gallery, acutely conscious of the curious and delicious odors that wafted up to us. Below, waves of sedate young women were passing through the company offering tuak and assorted Toradja foods, and pouring tea from kettles.

Then, in the center of the plaza, women covered with dazzling gold and silver jewelry and silk scarves began to perform traditional

Toradja dances. Moving delicately and with restraint, they harkened only to an internal rhythm, disregarding the more frantic tempo of the drums. The songs they sang were quiet, almost private. As guests, we were expected to approach the dancers, choose the one we most appreciated, and tuck a gift of rupiah, Indonesian currency, into her silken sash even as she continued her dance.

After the dances, deep-throated, frenetic chanting filled the plaza. Groups of men lurched in, bearing on their shoulders decorated bamboo cages in which prized pigs shrieked and squealed. Each offering of pigs was presented, acknowledged, then shunted aside to make room for the next. Pigs, some gargantuan, some lean, were brought singly and in groups of up to six. Soon the plaza became a maelstrom of men and pigs.

As the procession moved out of the plaza to a sacrificial area, gaiety filtered back. Fires sprang up, and pig carcasses were placed over them, as well as green bamboo containers filled with pork, red peppers, and blood, a Toradja delicacy. Much of the meat was consumed on the spot, although many villagers walked happily home that afternoon carrying chunks of pork for a future meal.

Feast Enhances Family Standing

It had been a rousing housewarming. The family members had fulfilled their obligations, both to the memory of their forebears and to their neighbors. They had reinforced their family's reputation, strengthened ties, and displayed their own wealth and largesse by distributing vast quantities of meat. The next day the head of a water buffalo would be presented to the household by the villagers, its horns later to be affixed to the facade of the refurbished house, where they would serve as a reminder of this generous feast.

Such feasts are part of a religion the Toradja have developed over many centuries. Fundamentally ancestor worship, its ritual falls into two types: one dealing with death and symbolized by darkness, descending smoke, and the setting sun; the other a celebration of life, with its symbols of light, rising smoke, and the morning sun. It had been an unexpected pleasure to attend a feast that fell under the rubric of the rising sun. Now, at the funeral we had come so far to see, we would witness the pageantry and solemnity of the ceremonies of the setting sun.

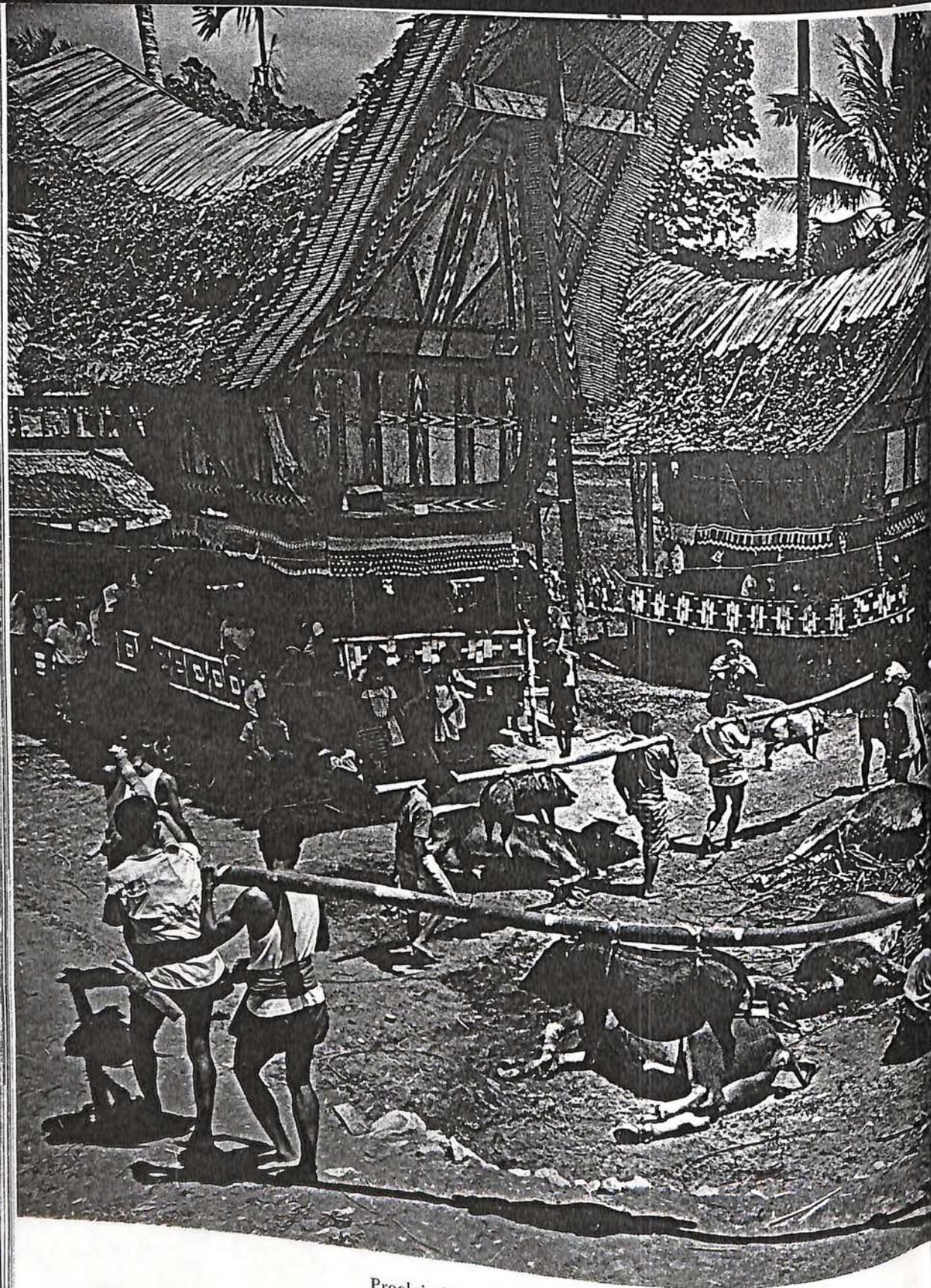


Feet, not fists, mark impromptu Toradja contests as kicking teams try to bruise opponents into disgraceful retreat. Spectators' enthusiasm soon turned into a free-for-all that strained the peace-keeping efforts of the helmeted Indonesian police.

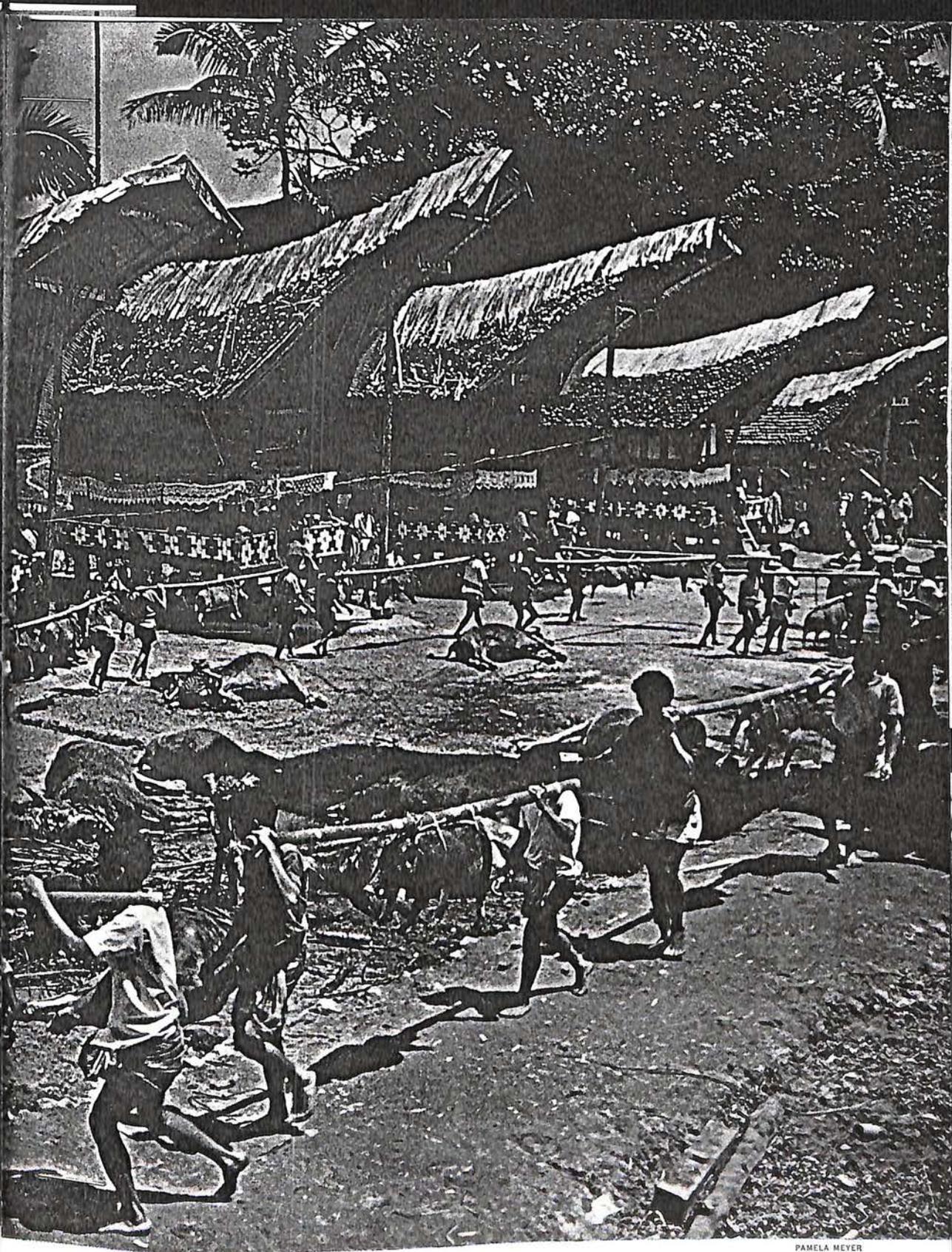
Strength, not skill, wins in water-buffalo bouts staged at funerals. Though the bulls battle fiercely, with great clashing of horns, the first animal to fall usually quits the fight.



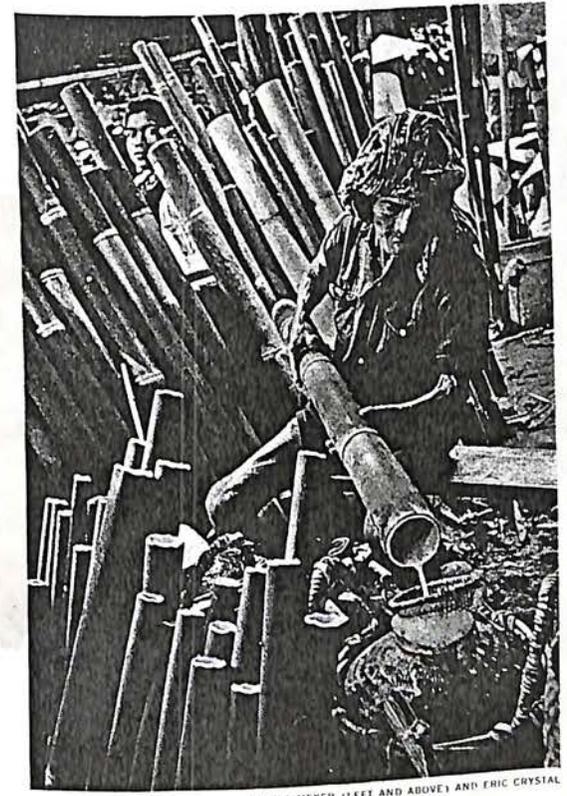
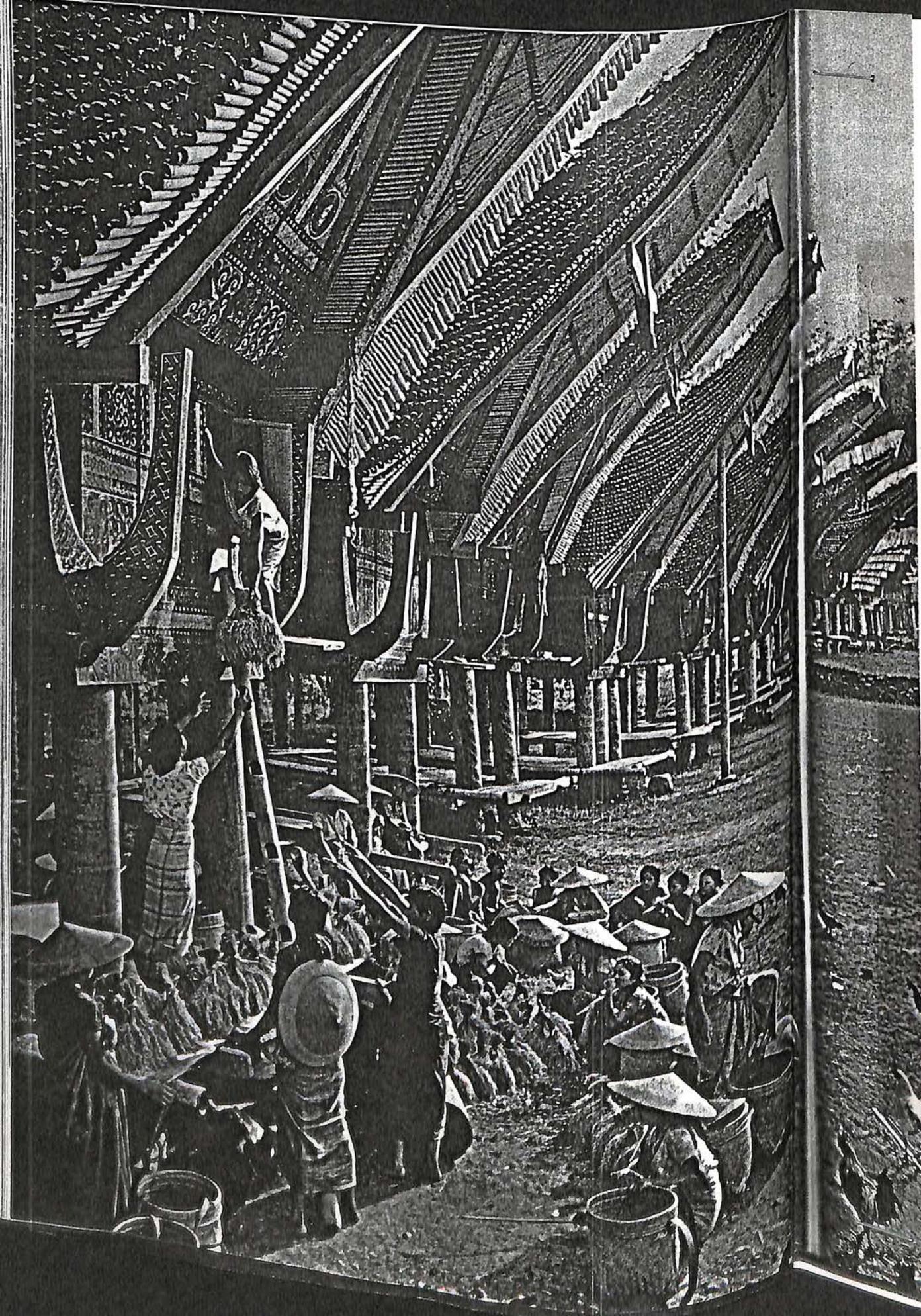
WINFIELD PARKS (TOP) AND PAMELA MEYER



Proclaiming cancellation of old debts, funeral guests display live pigs they have brought to repay Sa'pang's past generosity. Newly sacrificed water buffaloes, to be eaten at the funeral feast,



lie strewn on the central plaza. More than a dozen were offered, attesting to the wealth and high rank of the dead man. Platforms beneath the high-roofed granaries house relatives and close friends.

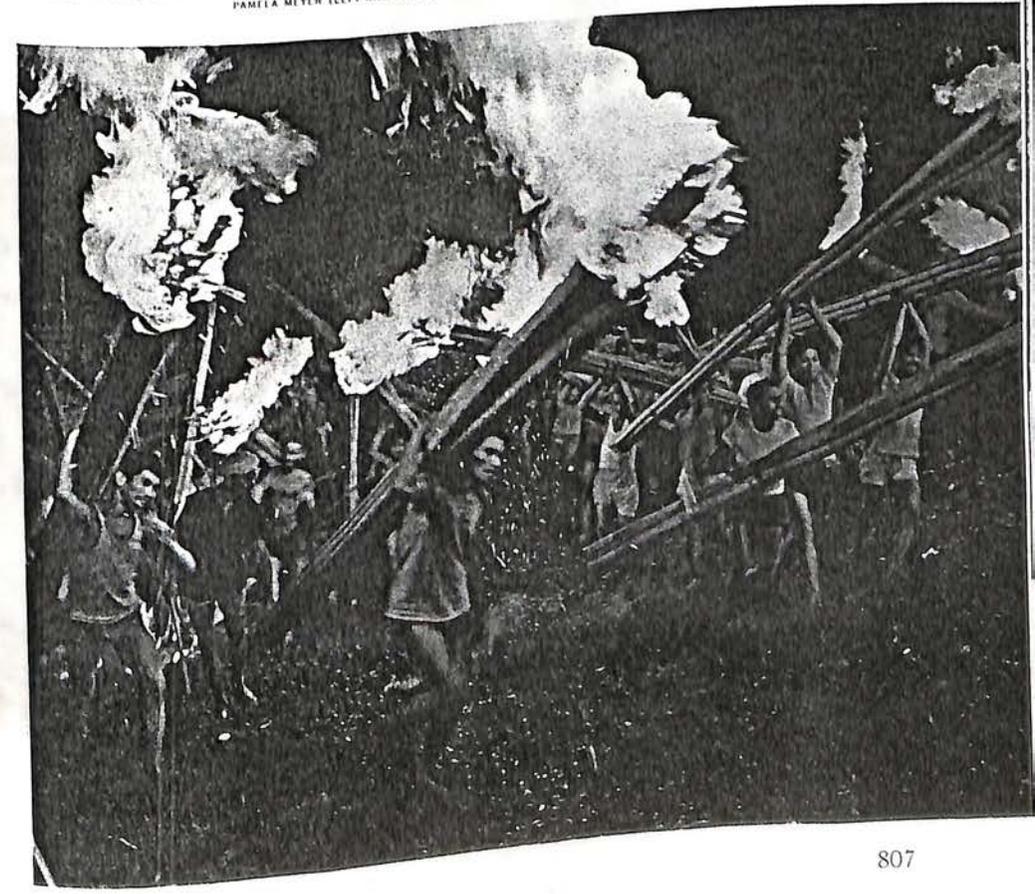


PAMELA MEYER (LEFT AND ABOVE) AND ERIC CRYSTAL

Everyday life in Toradja remains tied to a basically vegetarian diet, except during funerals and festivals. Women (far left) buy unhusked rice, stored in a rich man's armada of ark-shaped granaries. Their resemblance to ships suggests to some anthropologists a seafaring past for these mountain people.

Frothy tuak, a mildly intoxicating liquor made from sugar-palm juice, flows into a jug (left). Bamboo stems behind the vendor serve as collecting pails; smaller ones are for passersby, who select tubes sized to their thirst.

Fiery appeal for a bountiful harvest climaxes the rice festival, a nightlong procession of song and dance (below). The ceremony includes animal sacrifices and reenactment of the planting-to-harvest cycle.



Decree concerning grain tax on the islands
(text from Ross' school)

στοιχ 31
372/3

21

τοὺς πυροὺς ἄ[πο].

στήσει ὁ πριάμενος ἔλκοντας πάντε ε[κ]ῆ-
τέκας τὸ τάλαρον, τὰς δὲ κρι(θ)ὰς ἔλκο[υσ].

24 <α>ς τὸν μέδικνον τάλαρον ξηρὰς ἀποσ[τ].
ήσει καθαρὰς, αἴρων τὸ σκήκωμα ἐπὶ τῆ[ι] χ].
ἀν(η)ι> σηκώσας, καθάπερ οἱ ἄλλοι ἐμ[π]ορ[ο].
ι.

40 [Aboaidof ten is chosen each year when the summer is
οὗτοι δὲ ἀποστησάμενοι τὸν σῖτον κ[ε].
τὰ τὴ γεγραμμένα πωλόντων ἐν τῆ, ἄ[πο].
αι

30/vi/91

(Notes from a talk with Ron Stroud. ?? indicates uncertain memory)

The new grain-tax law

(Agon fund, 2 or 3 years ago)

The stele is relatively tall and narrow, with a slight taper. It is smooth down to a raised band, unscribed and without a relief (possibly some of this area had been painted). The top is an irregular curve instead of a pedimental V; this is thought to be original and surprising. On the band is THEOI (+?? AGATHH TYXH). The text follows in 61 lines (stoichedon 31), almost all legible, though there is water damage at the extreme right from the reuse of the stele as a drain cover. The mason sometimes omitted a part of a letter (e.g., the crossbar of an alpha or an eta, the dot in a theta) but the letters read e.g. <a> as a result are secure. There is some unscribed space at the bottom.

(TITLE)

First comes LAW ABOUT SITOS, then the archon date, 374/3.

So that the demos shall have sitos in common, the twelfth, and the fiftieth of grain, shall be farmed. One portion shall be 500 medimnoi, 100 of wheat and 400 of barley. The person who has bought the contract shall bring the grain from Lemnos, Imbros, and Skyros to the Peiraeus and up to the Asty and put it in the Aiakeion. The demos shall make this available roofed and doored and no rent shall be payable. Ten men shall be appointed in the same meeting as the assembly in which the generals are chosen to be in charge of the grain. The "contractor" (ho priamenos) shall pay 20 drachmas for ??sales tax and auctioneers' fees per 500 medimnoi. A group (symmory) may be formed of six persons, who may contract for 3,000 medimnoi; they shall be jointly and severally liable.

Lines 21--27 ... The contractor shall hand over the wheat weighing five hekteis the talent, the barley the medimnos a talent, dry, and clean he shall hand over, RAISING THE MEASURE, AT THE FUNNEL HAVING MEASURED, just as the other merchants do.

The grain shall arrive by Maimakterion and not be sold before Anthesterion. The demos shall determine on the sale and fix the price. The ten having received the grain according to the (above) provisions shall sell it in the agora.

(Complex provisions for allocating money from certain taxes to certain purposes, this year and on a more regular basis thereafter.)

FOR MSBF - GRAIN GRANARIES MILLS - FLOUR