

Heron's professional link to Rome), thought so ("ostendensque singula, de ratione ac difficultate cuiusque disserens").

In sum, economy of hypothesis suggests that the organ demonstrated in A.D. 68 at Rome was Heron's; this in turn establishes A.D. 68 as a *terminus ante quem* for Heron's invention of the new model and thus suggests a rough date for the publication of his *Pneumatica*. This *terminus ante quem* is consistent with and tends to confirm the two *termini post quem*, A.D. 55 and 62, associated with the publication of Heron's *Mechanica* and *Dioptra*. At the very least, we seem to have another date in the long-disputed chronology of Heron of Alexandria.<sup>14</sup>

PAUL KEYSER  
University of Colorado,  
Boulder

14. This paper has benefited from critical readings by W. M. Calder III, George Huxley, C. F. Konrad, and an anonymous referee of *CP*.

## THE FORTY THOUSAND CITIZENS OF EPHEBUS

In his sweeping critique of most of the methods used to estimate the populations of ancient cities, R. P. Duncan-Jones quotes the half-dozen surviving explicit ancient population figures, which in his view give a firmer base than the various methods of estimation, going back in many cases to Beloch's classic work on ancient demography.<sup>1</sup> Among them is a figure for Ephesus: "Ephesus had at least 40,000 male citizens, and thus a population probably no smaller than that of Pergamum, from the terms of a gift made in the second or early third century A.D."<sup>2</sup> As we shall see, Duncan-Jones' description of the nature of the evidence is not exact, but he follows a long tradition in accepting the figure of 40,000. The source of the figure is the interpretation of an inscription published by Josef Keil in 1930,<sup>3</sup> which was apparently first brought into the service of demography by T. R. S. Broughton in his work on Roman Asia Minor in Tenney Frank's *Economic Survey of Ancient Rome*. Broughton wrote as follows: "At Ephesus Aurelius Barenus entertained (besides the magistrates) 40,000 citizens (*Jahresh.*, XXVI [1930], beibl., 57f., late II), a figure which proves that

1. *The Economy of the Roman Empire: Quantitative Studies* (Cambridge, 1974), pp. 259-62, esp. 260, n. 4. Beloch's *Die Bevölkerung der griechisch-römischen Welt* (Leipzig, 1886), though always cited, is more often a convenient target than a model.

2. "Pergamum in the second century A.D. had a free adult population of about 80,000, and about 40,000 slaves, implying a total population of about 180,000 including children," says Duncan-Jones (*Economy*, p. 261, n. 4), basing himself on Galen *De propriorum animi cuiuslibet affectuum dignotione et curatione* 5.49 Kuhn. What Galen actually says is that Pergamum had 40,000 citizens and equal numbers of women and slaves; he does not indicate that the 40,000 citizens are all adults, but the tenor of the passage suggests it. Galen, it must be noted, gives the numbers while emphasizing how many Pergamenes (all but fewer than thirty) are less wealthy than his addressee and urging him not to wish to be richest of all, and he claims no great precision: εἴπερ οὖν ἡμῖν οἱ πολῖται πρὸς τοὺς τετρακτισμυρίους εἰσὶν ὁμοῦ, ἔαν προσθῇς αὐτοῖς τὰς γυναῖκας καὶ τοὺς δούλους, εὐρήσεις σαυτὸν δάδεκα μυριάδων ἀνθρώπων οὐκ ἄρκουμένον εἶναι πλουσιώτερον.

3. "Vorläufiger Bericht über die Ausgrabungen in Ephesos," *JÖAI* 26 (1930), Beiblatt, p. 57.

Beloch's estimate, based on a comparison of the area of Ephesus and Alexandria, that Ephesus had a population of about 225,000 (*Bevölkerung*, 230f.) is no exaggeration."<sup>4</sup> After Broughton, David Magie adduced the same inscription in his massive work on Roman Asia Minor. Though offering little comment on the inscription, Magie referred to Broughton and the inscription for support of his statement that the cities of Pergamum, Smyrna, and Ephesus each had populations of at least 200,000.<sup>5</sup>

The inscription in question is mechanically republished in *Die Inschriften von Ephesos* (no. 951) with the following comment: "40,000 Bürger; vgl. Broughton bei T. Frank, *An Economic Survey of Ancient Rome* IV 814; Magie 585 und 1446 Anm. 50. Plinius, Ep. X 116–17." Though, as we shall see, their citation of Pliny might have raised some doubts, the editors once more endorse the view that the inscription shows that Ephesus had 40,000 citizens. That is, however, not the case; all these eminent scholars have simply misread the Greek of the inscription. The text in question runs as follows:

ψ(ηφίσματι) β(ουλῆς) δ(ήμου)  
 Αὐρ(ήλιον) Βαρανον φιλοσέβαστον  
 φιλότειμον νεοποιὸν  
 ἀνάψαντα ἡμερῶν ἔνδεκα  
 καὶ ὑποδεξάμενον τήν τε  
 κρατίστην Ἐφεσίων βουλὴν  
 καὶ πάντα τὰ συνέδρια καὶ  
 πολεῖτας χειλίους τεσσαρά-  
 κοντα, μετέχοντα δὲ καὶ τοῦ  
 συνεδρίου τῶν νεοποιῶν  
 καὶ χρυσοφόρων, τὴν τιμὴν  
 ἀναστήσαντος παρ' ἑαυτοῦ  
 Μ. Φλ(αυίου) Δομετιανοῦ φιλοσεβ(άστου)  
 ὑοῦ ἀσιάρχου καὶ ἀσιάρχου  
 ἐκδίκου τῆς κρατίστης  
 Ἐφεσίων βουλῆς

Keil did not translate the inscription, but he characterized it as "ein schönes neues Zeugnis für die Munifizienz, mit der reiche Bürger in ehrenamtlichen Stellung Feste und Festmahle für eine riesige Teilnehmerzahl ausrichteten."<sup>6</sup> It may be that Keil's "riesige" led Broughton to understand χιλίους τεσσαράκοντα as "40,000," but perhaps Keil may simply have thought that entertaining 1,040 citizens meant dealing with a gigantic number. For that, of course, is what the phrase must mean. The passage of Pliny cited by the editors of *Die Inschriften von Ephesos* is worth quoting in this regard (*Epist.* 10. 116):

qui virilem togam sumunt vel nuptias faciunt vel ineunt magistratum vel opus publicum dedicant, solent totam bulen atque etiam e plebe non exiguum numerum vocare

4. *An Economic Survey of Ancient Rome*, ed. T. Frank, vol. 4 (Baltimore, 1938), p. 813.

5. *Roman Rule in Asia Minor to the End of the Third Century after Christ*, 2 vols. (Princeton, 1950), 1:585, 2:1446, n. 50.

6. "Vorläufiger Bericht," p. 57.

binosque denarios vel singulos dare. quod an celebrandum et quatenus putes, rogo scribas. ipse enim, sicut arbitror, praesertim ex sollemnibus causis, concedendum ius istud invitationis, ita vereor ne ii qui mille homines, interdum etiam plures vocant, modum excedere et in speciem διανομῆς incidere videantur.

Trajan's reply (10. 117) praises Pliny's interest in moderation. The parallel to the Ephesian inscription is very close: in both cases the entire βουλή (plus all the συνέδρια in Baranus' case) and over a thousand citizens have been invited. Even after one has taken proper account of the fact that Pliny is dealing with cities of more modest means and dimensions than Ephesus, his judgment about moderation is applicable to the latter: for Baranus to invite 1,040 citizens in addition to the council and συνέδρια was a great deal, on the edge of propriety (even over eleven days, or perhaps nights, as ἀνάψαντα suggests). For him to have entertained 40,000 is surely out of the question.

In any event, χιλίους τεσσαράκοντα cannot mean 40,000. For one thing, χιλίους is an adjective modifying πολεΐτας, not a substantive that could be modified by τεσσαράκοντα. For another, Greek has standard and well-attested ways of expressing the idea of 40,000. The normal one is τετρακισμύριοι, formed as is normal for numerals of 2,000 and greater by a numerical adverb modifying the adjective. It is overwhelmingly common; a search of the *Thesaurus Linguae Graecae*<sup>7</sup> shows nineteen occurrences of forms of τετρακισμύριοι in Diodorus alone, another seven in Josephus, five in Dionysius of Halicarnassus, seven in Appian, and so on. A second, less common method uses the substantive μυριάς modified by a numerical adjective. Diodorus, it seems, uses this form mostly when needing to express numbers greater than 90,000 (ten myriads, e.g., in 2. 17. 2), but it can (and occasionally does) occur with smaller figures (e.g., five myriads in 5. 25. 1).<sup>8</sup> A third means is comparatively rare, the use of χιλιάδες with numbers greater than nine; there is one example in Diodorus (21. 6. 2 ἑκατὸν χιλιάδες). It is a usage relatively popular in the Septuagint (τεσσαράκοντα χιλιάδες in Num. 1:21; over 240 examples of χιλιάδ- in the Septuagint), but unknown to documentary usage until it appears in papyri of the Arab period.

In a phrase ordered like χιλίους τεσσαράκοντα, on the other hand, the elements are uniformly to be taken as a descending series: first are given the thousands, then the hundreds, then the tens, then the ones (the ascending series also occurs—e.g., Hdt. 1. 32. 3 ἡμέρας διηκοσίας καὶ πεντακισχίλιας καὶ διςμυρίας—in which case the καὶ is mandatory, as it is not in the descending series). It is unnecessary to give numerous examples of this phenomenon, but one illuminating case from 2 Esdras (i.e., Ezra and Nehemiah) seems worth quoting. In the middle of the list of those who returned from the Babylonian captivity, along with numbers written in the manner described above (e.g., 2:35 τρισχίλιοι ἑξακόσιοι τριάκοντα, 2:38 χίλιοι διακόσιοι τεσσαράκοντα ἑπτά) we find (2:37, 17:40) χίλιοι πενήτηκοντα δύο. So far as we know, no one has ever suggested that the sons of Immer were 52,000 in number, particularly since the total given for the entire people is 42,360 plus slaves (2:64).

7. Using the invaluable experimental CD-ROM on an Ibycus computer.

8. Cf. the passage of Galen quoted in n. 2 above for his use of τετρακισμύριους side by side with δώδεκα μυριάδων.

How many citizens Ephesus had in the late second century, or at any other period, we do not know; but Baranus' inscription is no evidence for a figure of 40,000.<sup>9</sup>

PRESTON DUANE WARDEN  
*Ohio Valley College*

ROGER S. BAGNALL  
*Columbia University*

9. This paper was prepared during a Summer Seminar for College Teachers, on the Greek city, sponsored by the National Endowment for the Humanities and held at Columbia University in the summer of 1987. We express our appreciation to the Endowment for making the seminar possible.