ORBIS and the Ancient Itineraries: Preliminary Observations

Dan-el Padilla Peralta (Stanford University)

At an early stage in the construction of ORBIS, a short study was undertaken to compare the distance measurements generated through our network with the distances recorded in the major ancient itineraries. Because of the scale of the maps employed to create our model's road network, concern arose that our road paths might be straighter and as a result shorter than actual Roman roads. This study sought to test the hypothesis that our network's routes might be too short by comparing their measured distances to their itinerary counterparts.

After Walter Scheidel drafted a list of the road segments to be employed in the building of our network, itinerary information for as many of these segments as possible was gathered and tabulated. For each road segment, first the Antonine Itinerary (ed. Löhberg 2010; hereafter IA), then the Bordeaux (ed. Cuntz 1965; hereafter IB), and finally the Peutinger Table (ed. Talbert 2011; hereafter PT) were consulted. In the interests of maximizing the number of comparisons with the IA, this itinerary's information was privileged over that of the other two in the event of conflict (though such conflicts were extremely rare; for an illustration of such conflicts see Chevallier 1997: 57 with fig. 13 on the next page). In select cases where no one itinerary provided complete information on a route, an itinerary measurement was patched together from the testimony of individual itineraries for particular slivers of that route. All itinerary measurements in milia passuum (or leugae) were then converted into kilometers. Road segments for which no itinerary information could be obtained were excluded from further study.

Itinerary information for 398 road segments (IA = 354; IB = 9; PT = 35) was submitted to technical lead Elijah Meeks and research contributor Jonathan Weiland. With this data in hand, Meeks generated a chart comparing our system's point-to-point route measurements with those of the itineraries, together with a map representing this comparison in visual form (Figure 1).

The very simplified table below (Table 1) summarizes the magnitude and distribution of the differences between the segment measurements provided by our network and those obtained from the itineraries.

Itinerary route shorter	No. of seg.	Itinerary route longer	No. of seg.
1. By 30% or more	34	By 30% or more	41
2. By 10% to 30 %	48	By 10% to 30%	68
3. Approximately the same (10%>)	80	Approximately the same (10%>)	127

Table 1

The initial hypothesis—that our network's measured distances would be shorter than those recorded for the itineraries—was not supported by the data in Table 1, which point instead to systematic differences between the itinerary information and our measurements (although it should be emphasized that slightly over half of all our measurements do more or less conform to the those of the itineraries: Row 3, Table 1). In an effort to make further sense of the data—and to track down any errors in the initial tabulation of itinerary distances—especially egregious outliers (30% or greater on either side of the distribution tail) were studied more closely. The simple errors that were identified and corrected (itinerary distances for individual stages of the road segments not being summed correctly; discrepancies between the route mapped by our network and that followed by the itineraries, etc.)[1] did very little to affect the overall shape of the distribution documented in Table 1. More fundamental issues appear to be in play.

First, study of the major outliers (30+%) has lent strong support to the suspicion that the evidence of some itineraries is less trustworthy than that of others. To be sure, differences in the quality of the testimony furnished by the itineraries have come to the attention of scholars before (note the overview of the major itineraries in Chevallier 1997: 53-60, with notes). In our study, the PT stood out as especially problematic: of the 35 itinerary distances derived from the PT, just a shade over half (18) differed from the measurement obtained through our network by 30% or more. Put differently: despite providing only 9% (35 of 398) of the itinerary distances utilized in our study, the PT accounted for almost a quarter (18 of 75) of our major outliers (Row 1, Table 1 above). If, as argued by Talbert 2010, the PT was not designed as an aid to travelers but rather as a celebration of the pax ushered in by Diocletian, it is reasonable to speculate that the creators of the map might have placed much less of a premium on accuracy in their listing of distances. This topic merits additional scrutiny.

Second, differences between our measurements and the itinerary data are very likely to reflect well-known problems with the itineraries. Scribal errors, accumulating over many centuries of textual transmission, have long been believed to lie behind the most aberrant readings in the itineraries. In the case of the IA in particular, attention has been lavished on emending measurements deemed obviously incorrect and/or corrupt. (It should be added that errors are not confined to individual itinerary stages: the cumulative distances listed on the IA are equally liable to corruption, as Rivet and Jackson's 1970 study of the testimony for Britain underlined.) But textual corruption—or simplification, such as the tendency of the IA to give rounded-down distances (for examples of this see González 2011)—is not the only likely culprit for distorted distance measurements. We also have to contend with a core conceptual feature of the IA: how its routes are constructed. Building on decades of scholarship, Chevallier was able to demonstrate that the paths of the IA "sont constitués de tronçons de routes différentes"—and that the itinerary route-designers made mistakes as they toggled back and forth between major roads (Chevallier 1997: 58). This is not to say that the IA is uniformly wrong or wholly unreliable: several local studies have demonstrated that the IA can be reliable over short stretches (Goodchild 1949 on Roman Palestine; González 2011 on Hispania's Meseta Central; but cf. Rivet and Jackson 1970). The presence of local variations in reliability, however, underscores another feature of the IA that is the subject of an ongoing

study (Padilla Peralta in progress; see below).

Third, in instances where close examination of particular outliers revealed that the route mapped and measured by our network differed from the one traced by the itineraries, our route did tend to be the straighter of the two; but this has less to do with the properties of our model's conceptualization of Roman roads (of concern when we formulated our initial hypothesis) and much more to do with the IA's design. For purely illustrative purposes, let us take the road segment Aternum-Larinum in peninsular Italy. Our model calculates the direct road distance between the two as 102 km; IA lists a set of stages that total 130 km. When the individual IA stages were studied more closely, however, it became apparent that the IA route dips inland to Anxanum before returning to the coast on a road roughly parallel to the Sagrus River; our model, on the other hand, takes the most geographically direct route by staying on the coast until the inland bend towards Larinum. More study is needed of non-direct movement in the itineraries, which seems to speak to a kind of terrestrial cabotage.[2] In any event, this and other examples can be marshaled in support of the proposition that, as far as modeling direct point-to-point movement across the Roman road network, ORBIS is more reliable than the itineraries.

Finally, there is the question of local and regional variation in the IA data. This particular issue is the focus of an ongoing study (Padilla Peralta in progress). For the purposes of this new study, it was decided to concentrate on the 248 road segments for which the difference between the recorded itinerary distance and the measurements generated by our model is 15% or less (higher or lower). These road segments were next sorted and grouped according to region: Africa, Italy, Gaul, Alps, Balkans, Hispania, Britain, Asia Minor/Mesopotamia, and Palestine/Syria.[3] Study of regional trends in the frequency of higher versus lower measurements relative to the itinerary data brought to light an interesting pattern (Table 2).

Region	% of measurements higher than IA	% of measurements lower than IA
Africa	41%	59%
Italy	31%	69%
Gaul	40%	60%
Alps	48%	52%
Balkans	48%	52%
Iberia	44%	56%
Britain	75%	25%
AM/Mes.	17%	83%
Pales/Syr.	21%	79%

Table 2

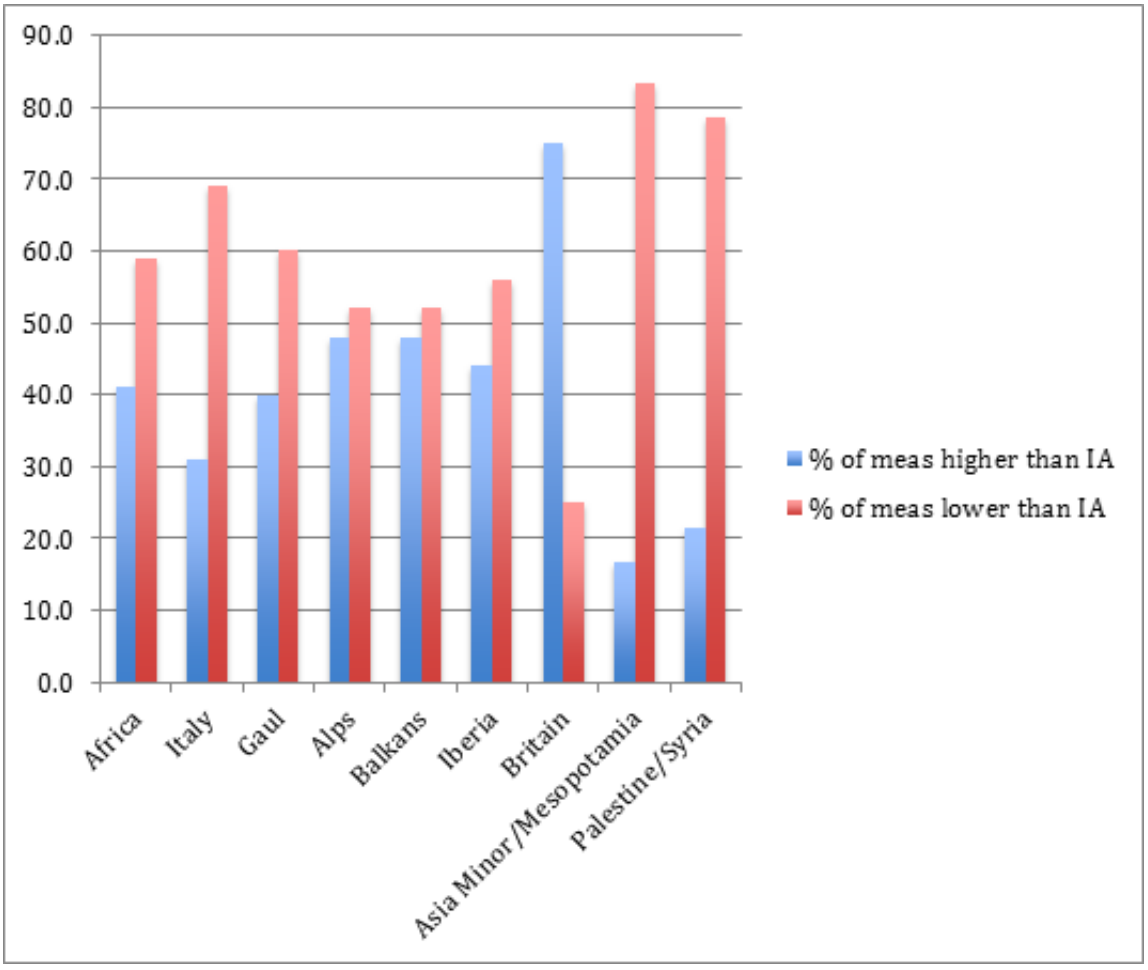

Figure 2

Pending more granular statistical analysis, these figures should be taken as merely suggestive—but the suggestion is striking. There is something qualitatively different about the IA information for distances in Britain (at one end of the spectrum) and Asia (on the other); what might account for this? Inspired by ORBIS, the ongoing study seeks to outline some provisional answers to this and related questions. For future researchers, ORBIS will be useful not only as a means for gaining purchase on the realities of mobility in the Roman Mediterranean, but as a tool for evaluating gradations in the nature and quality of the information furnished by the IA and other itineraries for road travel in the Empire's various regions.

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1. Apart from the sources of error discussed in more detail above, there is also the possibility that the BA maps upon which our network was constructed might locate one or several sites incorrectly (in which case all measurements involving such sites would be flawed). Thus, for example, while the BA does give a location for Perdices in North Africa, its precise geographic placement is uncertain (and the BA acknowledges this by placing a question mark next to the site). But this is not a problem capable of systematically biasing our results. In the special case of Upper Egypt, differences between our model's measurements and those of the itineraries were due to a feature of our model; see note 3 below. As for elevation and its distortionary effects on our measurements and/or those recorded in the itineraries, Weiland and Padilla Peralta are in the process of studying this more closely; but see Table 2 on the measurement profile of the Alps relative to that of other regions covered by the IA. ↑
2. Schmidt's provocative analysis of the Vicarello goblets (2011) gestures indirectly at the motivations for this kind of travel—and the representation of such travel. ↑
3. Segments from Egypt are not included. As discussed in "Building ORBIS: Road transport," our model assumes a single road along the Nile for Upper Egypt. In its present form our one road does not correspond to the path traced by the IA (which runs on the opposite bank). The decision on how to allocate road segments that could be assigned to several regional sub-units (e.g., the Alps or Gaul) was made on a case-by-case basis; shuttling around contestable segments from one region to another does not significantly impact the pattern outlined in Table 2. ↑