Journal of Early Christian History

Routledge
Taylor & Francis Group

ISSN: 2222-582X (Print) 2471-4054 (Online) Journal homepage: http://www.tandfonline.com/loi/rech20

Paul's Journeys in 3D: The Apostle as Ideal Ancient Traveller

Mark Wilson

To cite this article: Mark Wilson (2018): Paul's Journeys in 3D: The Apostle as Ideal Ancient Traveller, Journal of Early Christian History, DOI: 10.1080/2222582X.2017.1411204

To link to this article: https://doi.org/10.1080/2222582X.2017.1411204

Published online: 18 Jun 2018.

ARTICLE

Paul's Journeys in 3D: The Apostle as Ideal Ancient Traveller

Mark Wilson
https://orcid.org/0000-0002-8536-2718
University of South Africa
Department of Biblical and Ancient Studies, South Africa
markwilson@sevenchurches.org

ABSTRACT

Travel in Asia Minor during the Roman period was ubiquitous. The apostle Paul is used as a heuristic model of the ideal ancient traveller. His first journey in provincial Galatia—geographical Pamphylia, Pisidia, and Phrygia—is examined, particularly as it relates to suggested routes and time of travel. It will utilise Bekker-Nielsen's pioneering 3D methodology that applies Naismith's rule to produce more objective outcomes. Practical issues related to ancient travel, such as equipment, load, and weather, will also be explored. This investigation will help to refine travel times and itineraries, and thus hopefully produce more accurate Pauline chronologies.

Keywords: Paul's first journey; ancient travel; Naismith's rule; Via Sebaste

Introduction

"I have been on frequent journeys experiencing dangers from rivers, dangers from robbers, … dangers in the city, dangers in the countryside, dangers at sea, … fatigue and hardship, frequent sleepless nights, hunger and thirst, frequent missed meals, cold and exposure."[1] Paul's descriptive summary could easily sum up the vicissitudes of travellers in Asia Minor during the Roman period. Travel by land was ubiquitous.[2]

1 Gr. ὁδοιπορίαις πολλάκις, κινδύνοις ποταμῶν, κινδύνοις λῃστῶν... κινδύνοις ἐν πόλει, κινδύνοις ἐν ἐρημίᾳ, κινδύνοις ἐν θαλάσσῃ...κόπῳ καὶ μόχθῳ, ἐν ἀγρυπνίαις πολλάκις, ἐν λιμῷ καὶ δίψει, ἐν νηστείαις πολλάκις, ἐν ψύχει καὶ γυμνότητι (2 Cor 11:26–27; author's trans.).

2 For a classic exposition of this, see Caroline A. J. Skeel, *Travel in the First Century after Christ with Special Reference to Asia Minor* (Cambridge: Cambridge University Press, 1901).

UNISA university of south africa PRESS
Routledge Taylor & Francis Group

Journal of Early Christian History
www.tandfonline.com/rech20

https://doi.org/10.1080/2222582X.2017.1411204
ISSN 2471-4054 (Online), ISSN 2222-582X (Print)

Cicero (*Att*. 5.13–21) travelled from Ephesus through Laodicea and Iconium to Tarsus and his province Cilicia. Pliny the Younger (*Ep.* 10.17A) complained about the heat while journeying from Ephesus to Pergamum. Flavius Zeuxis made the trip between Hierapolis and Ephesus at least seventy-two times on his way to Rome (*CIG* 3920). Herod the Great travelled from Sinope through Paphlagonia, Cappadocia, and Phrygia on his way to Ephesus (Josephus *A. J.* 16.12.2). These ancient travellers all used the extensive infrastructure of Roman roads. One of the first acts of Manius Aquillius, the governor of the new province Asia (129 BCE), was to construct a road from the Aegean coast to Pamphylia on the Mediterranean coast. Milestones show Ephesus as one *caput viae*, while another milestone found near Side suggests Pergamum as a second *caput viae*.[3] Over one thousand milestones have been recorded, particularly by the late David French.[4] Many sections of Roman roads along with bridges and viaducts are still preserved in Turkey today. Thus the means of ancient travel has become much better known.

One of the most frequent travellers in the eastern Roman Empire during the imperial period was the apostle Paul. Three major journeys related to Asia Minor are recorded in the book of Acts. This article will use the first Anatolian journey as a heuristic device for viewing Paul as the ideal traveller so as to shed light on the mechanics and challenges of travel in antiquity.

Travel Time in Antiquity

Estimating travel times in antiquity has become as fluid as estimating the demographics of ancient cities. Each scholar seems to arrive at a different estimate.[5] Perhaps the best ancient source that discusses "normal" travel times is Gaius (*Provincial Edict*, book 1) quoted in Justinian (*Dig*. 2.11.1). Here the time allocated for a party to appear in court is based on a travel day of 20,000 paces, or 20 Roman miles. This is the equivalent of 29.6 kilometres (18.3 mi.).[6] Biblical scholars, whether knowing Gaius's suggestion or not, have engaged in calculating travel times for Paul's journey. For example, Reisner estimates "in the case of longer journeys over fairly normal terrain, a day's journey by foot as covering from 15-20 miles, or 20-30 km."[7] Hiking guides likewise suggest that a

3 Christian Marek, *In the Land of a Thousand Gods: A History of Asia Minor in the Ancient World* (Princeton: Princeton University Press, 2016), 255.

4 See French's numerous monographs on the roads of Asia Minor on the British Institute at Ankara website: http://biaa.ac.uk/publications/item/name/electronic-monographs.

5 A popular internet site that estimates travel times is Orbis: http://orbis.stanford.edu/ (accessed September 1, 2017).

6 Under Agrippa the Roman pace (*passus*) was standardised at 5 Roman feet, about 1.48 metres (4 ft. 10 in.). The Roman mile had 1000 paces (*mille passus* or *passuum*). Rainer Reisner, *Paul's Early Period: Chronology, Mission Strategy, Theology* (Grand Rapids: Eerdmans, 1998), 311, cites Gaius's statement in the *Digest* for making his estimate.

7 Reisner, *Paul's Early Period*, 311; cf. Craig S. Keener, *Acts* (Grand Rapids: Baker, 2012), 1:87.

walking speed of 4–5 kilometres (2.5–3.0 mi.) an hour is possible for a fit walker, thus achieving 32-40 kilometres (20–24 mi.) per day.[8] However, what is meant by a "fairly normal terrain" or a "fit walker" remains ambiguous.

Schnabel has used such data to compile a map estimating Paul's travel times between various cities (Fig. 1).[9] His second journey from Antioch on the Orontes to Troas is estimated at forty-five days over a distance of 1448 kilometres (900 mi.) at the most conservative travel rate. However, another recent study of this route estimated the distance at 1600 kilometres (1000 mi.).[10] Using only two-dimensional modelling then, the time difference would be approximately five days longer.

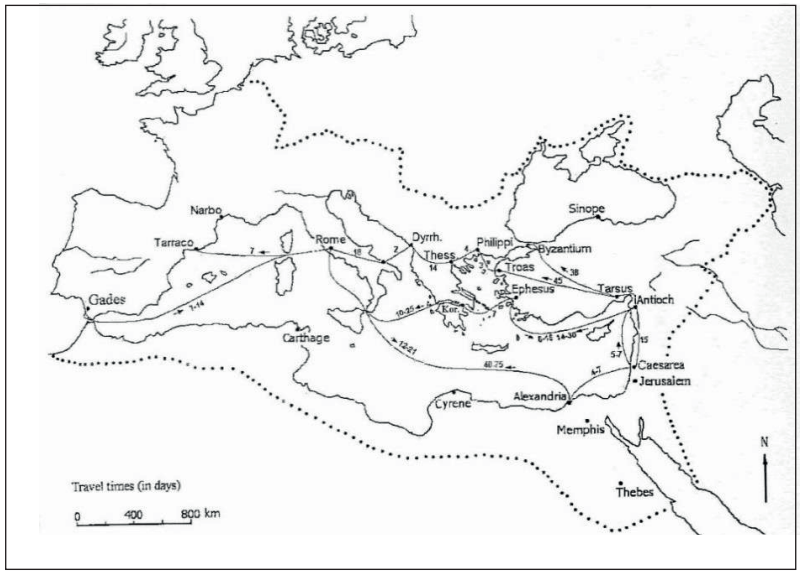

Figure 1: Schnabel's estimated travel times (Used with the permission of InterVarsity Press)

Regarding the first journey, Schnabel has estimated the travel time to Pisidian Antioch along the Via Sebaste as 280 kilometres (176 mi.) taking about eleven days of travel (25.5 km/16 mi. per day).[11] Another estimate for this route using a digital map measurer along the roads depicted in the 2D *Barrington Atlas of the Classical World* is 250 kilometres (155 mi.).[12] The estimated distance up the Cestrus River valley through Pisidia—the

8 See, for example, the discussion at http://bushwalkingnsw.org.au/clubsites/FAQ/FAQ_Navigation.htm (accessed August 2, 2016).

9 Eckhard Schnabel, *Early Christian Mission: Paul & the Early Church* (Downers Grove: IVP, 2004), 2:1627, fig. 41.

10 Glen L. Thompson and Mark Wilson. "The Route of Paul's Second Journey in Asia Minor: In the Steps of Robert Jewett and Beyond," *Tyndale Bulletin* 67, no. 2 (2016): 242.

11 Eckhard Schnabel, *Acts* (Grand Rapids: Zondervan, 2012), 614.

12 Richard Talbert, *Barrington Atlas of the Greek and Roman World* (Princeton: Princeton University Press, 2000), 65.

route depicted in all Bible atlases—is 163 kilometres (101 mi.).[13] The estimated travel time using Gaius's suggestion along the western route of the Via Sebaste would be approximately 8.5 days (250/29.6 = 8.45); for the central route via Adada 5.5 days (163/29.6 = 5.51).

Such two-dimensional calculations, however, fail to account for the mountainous terrain of Pisidia through which Paul had to travel. Recently Bekker-Nielsen has pioneered a fresh approach by adding a three-dimensional perspective. Thus the chronologies related to ancient travel, including Paul's journeys, must be revised to account for topographical realities. In addition to providing more precise calculations for travel times, Bekker-Nielsen's methodology can also help to clarify which routes Paul might have taken, particularly on his first journey.

Ancient Travel in 3D

Bekker-Nielsen notes three reasons why studying roads in two dimensions has been the predominant approach in scholarly circles: 1) success of aerial photography by twentieth-century pioneers like Raymond Chevallier in dealing with the subject; 2) generating an elevation profile from a contour map has been costly and time-consuming, and 3) obtaining reliable elevation data in some countries has been impossible.[14] The emergence of Google Earth and other freeware computer programs such as GPSVisualizer, RConverter, and Geocontext now allows anyone to generate the elevation profile of a road or route quickly and easily. This offers entirely new possibilities for analysing roads as well as creating simulations for comparative or counterfactual approaches.

In 1892 the Scottish mountaineer James Naismith devised a way to calculate the additional time required to walk uphill during a hike. He attempted to quantify the impact that gravity had on hiking and devised a formula today called Naismith's rule. Adding one metre of ascent takes as much time as walking 7.92 metres on level ground. Or stating this in terms of time, one hour must be allowed for 5.0 kilometres (3.1 mi.) forward plus one hour for every 600 metres (2,000 ft.) of ascent. Applying Naismith's rule, Bekker-Nielsen writes,

> For instance, consider a route that is 1000 metres long and crosses five small valleys, each of which is six metres deep. If the route were level, it would take twelve minutes to walk it. But

13 Mark Wilson, "The Route of Paul's First Journey to Pisidian Antioch," *New Testament Studies* 55 (2009): 476, 479.

14 Tønnes Bekker-Nielsen, "Ancient Roads in the Third Dimension" (paper presented at the conference Roads and Routes in Anatolia: Pathways of Communication from Prehistory to Seljuk Times, British Institute in Ankara, Turkey, March 20–22, 2014). I also want to thank him for his assistance in implementing this methodology into the present study. However, I take responsibility for any errors made in its calculations.

> when we include the cumulative elevation gain of thirty metres and multiply by 7.92, we find that the time-distance is 1238 metres: it will take fifteen minutes, not twelve, to walk.[15]

This experience can be simulated by walking on a treadmill if one sets the speed at 5.0 kilometres per hour (3.1 mph) and the incline setting at 1.0. Then as the incline setting is slowly increased, the resistance becomes more noticeable on the treadmill.

Bekker-Nielsen has adapted Naismith's formula to his own research on Roman roads, particularly for predicting which route the Romans might have used to engineer the road into Hadrianopolis in northern Asia Minor. He has concluded that Naismith's rule adds a critical third dimension to our understanding of the engineering and use of roads in antiquity. His study of Roman roads in 3D inspires biblical scholars to go beyond the traditional 2D approach to Paul's journeys and see how 3D modelling might affect travel chronologies. The vertical dimension now allows for the introduction of the factor of gravity. The availability of accurate elevation data coupled with sophisticated computer modelling programs now makes it possible to generate an elevation profile for any of Paul's suggested routes. Because the route of the first journey is the most problematic in terms of travel times and routes, it will be considered next.[16]

Paul's Route from Perga to Pisidian Antioch

Three suggested routes between Perga to Pisidian Antioch were recently reviewed, with the Eastern Route being quickly discounted (Fig. 2).[17] The other two routes—the Western Route following the Via Sebaste and the Central Route following the Cestrus River—are presented next both in 2D and 3D and assessed along with a third proposed route. The results will be summarised in a table after the maps are presented.

15 Bekker-Nielsen, "Ancient Roads," 2.

16 Elevation profiles can also aid in determining which of the two possible routes for Paul's third journey from Apamea to Ephesus is most likely. When ascent is factored in, it adds 1.5 days to the Cayster journey as opposed to its 2D estimate. And the Cayster route would take over 2.2 days longer to walk than the Meander route when elevation is considered; see Mark Wilson, "The 'Upper Regions' and the Route of Paul's Third Journey from Apamea to Ephesus," *Scriptura* (forthcoming).

17 Wilson, "The Route of Paul's First Journey," 472–80.

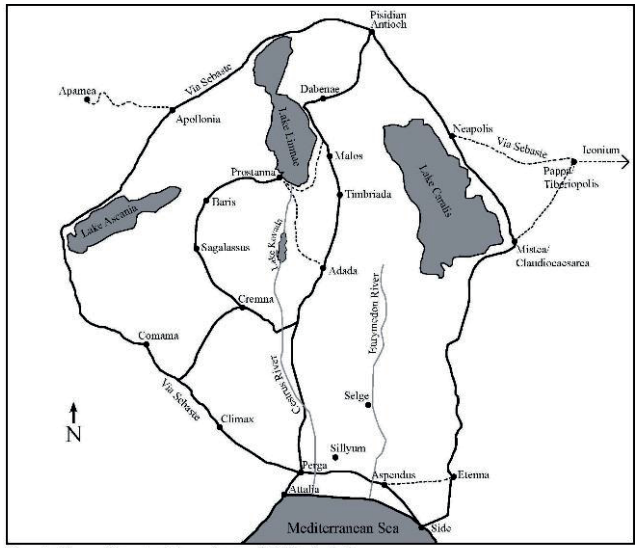

Figure 2: Routes in southern Galatia (Courtesy of the author)

The route of the Via Sebaste projected in 3D using Geocontext appears next (Fig. 3).[18] This route was re-drawn slightly from the 2D map shown above with changes based upon autopsy of the route in June 2016.[19]

18 From among the software programs mentioned earlier in the article, Bekker-Nielsen recommends that Geocontext be used. It has a higher resolution with the distance between measuring points about 45 metres. I wish to thank my research assistant David Johnson for organising this data gathered from the maps that I drew on Google Earth. These maps were saved as a kmz file, then uploaded into Geocontext to produce the three maps included in this article.

19 Thanks go to Bob Wagner for sharing his knowledge of the Via Sebaste during our excursion together. The route depicted goes above Lake Ascanius; cf. the *Barrington Atlas*, map 65, and David H. French, *Roman Roads & Milestones of Asia Minor, Lycia et Pamphylia* (Ankara: BIAA, 2014), 19 map 5.1. For reasons beyond the scope of this article, this author does not accept the revision that places the route southeast of the lake; cf. "Asia Minor in the Second Century C.E.," Ancient World Mapping Center (http://awmc.unc.edu/wordpress/blog/2017/02/22/wall-map-now-available-asia-minor-in-the-second-century-c-e/; accessed July 20, 2017).

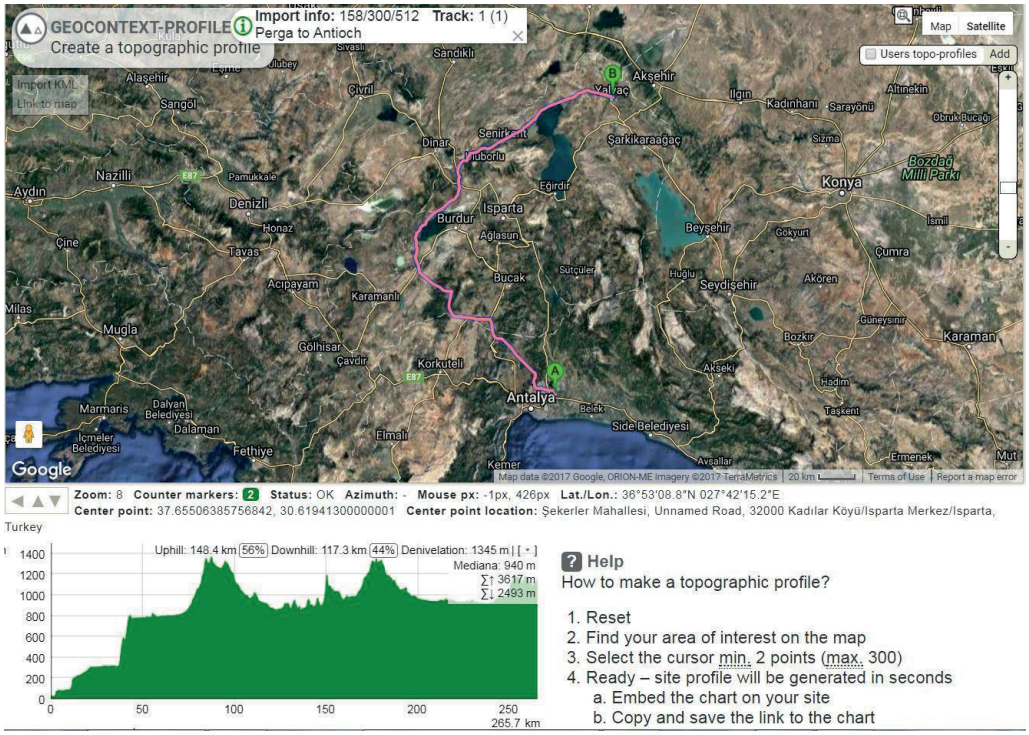

Figure 3: Route of Via Sebaste in 3D (Courtesy Geocontext)

All Bible atlases and maps depict the apostles travelling directly north from Perga along the Cestrus River valley before passing through the Taurus Mountains and returning along the same route. The following map in the *ESV Bible Atlas* depicts this route (Fig. 4).[20]

20 John D. Currid and David P. Barrett, *Crossway ESV Bible Atlas* (Wheaton: Crossway, 2010), 241.

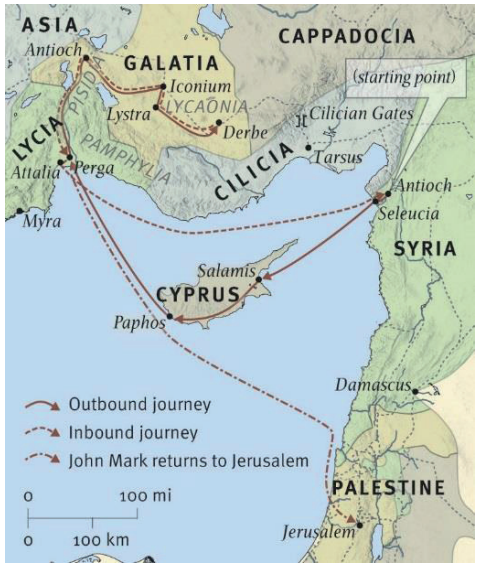

Figure 4: Route of Paul's first journey in *ESV Bible Atlas* (Courtesy Crossway Publishing)

This same route is now depicted in 3D in Geocontext (Fig. 5):

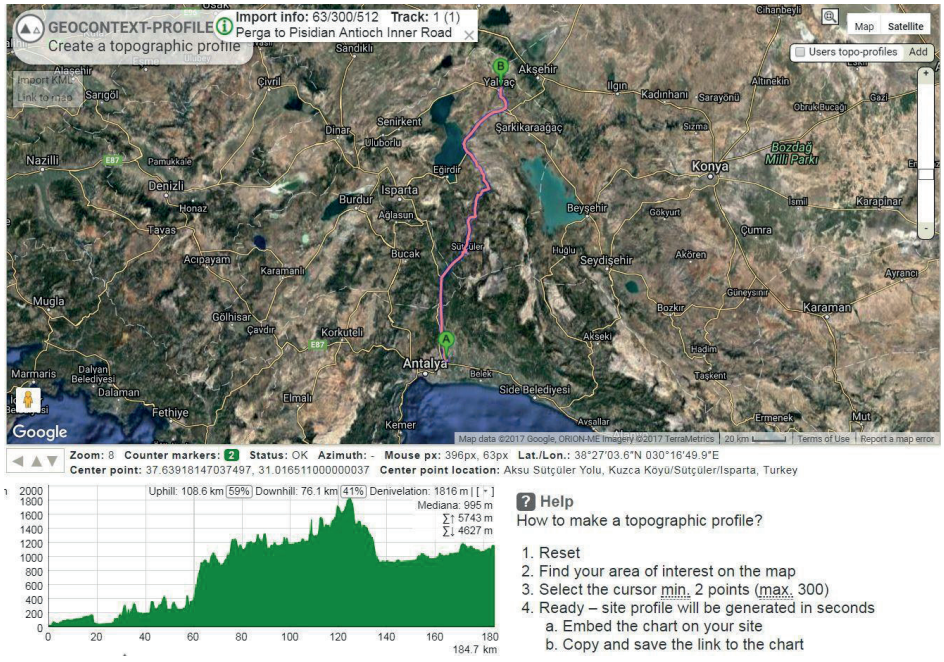

Figure 5: Cestrus valley route in 3D (Courtesy Geocontext)

Fairchild has recently proposed an alternative route that purports to link Paul with Jewish communities in the Pisidian cities of Sia, Melli, and Sagalassos. The route splits the western and central routes and follows a rugged mountain track across the Taurus Mountains before descending to the southern shore of Lake Limnae at Prostanna. It then joins the central route on the eastern side of the lake to reach Pisidian Antioch (Fig. 5).[21]

Figure 6: Fairchild's route through Pisidia (Courtesy of *Biblical Archaeology Review*)

The following map is the 3D modelling of this route (Fig. 7):

21 Mark R. Fairchild, "Why Perga? Paul's Perilous Passage through Pisidia," *Biblical Archaeology Review* 39, no. 6 (November/December 2013): 54, 58–59.

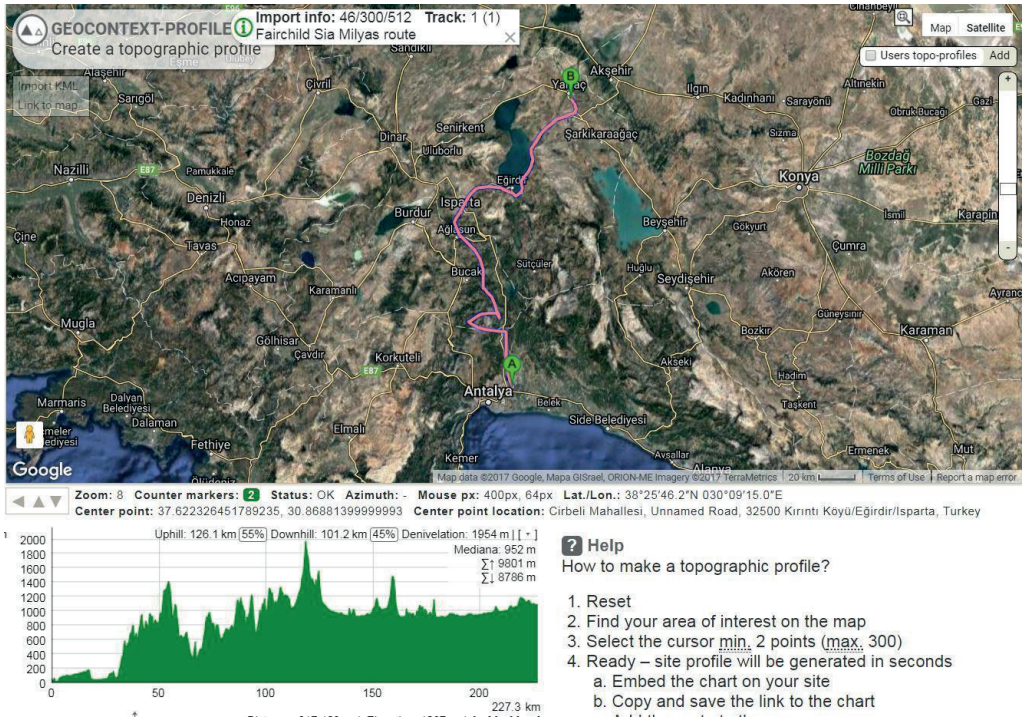

Figure 7: Fairchild's route in 3D (Courtesy Geocontext)

The data from the 2D and 3D modelling of each route is presented next (Fig. 7). The travel days are determined by dividing the figure calculated under Naismith by 29.6 kilometres.[22]

Table 1: Table comparing the three proposed routes

	Distance (km)	Ascent (Σ↑)	Naismith	Travel Days
Via Sebaste	265.7	3617	294.3	9.90
Barrington	251.0			8.48
Central	184.7	5743	230.18	7.78
Barrington	183.5			6.19
Fairchild[1]	227.3	9801	304.91	10.30

1 This route was not calculated on the *Barrington Atlas* because it does not show any routes connecting some of the cities mentioned by Fairchild.

22 The formula used in the chart is: (d + [Σ↑ * 7.92] = T); Wikipedia, s.v. "Naismith's Rule," https://en.wikipedia.org/wiki/Naismith%27s_rule (accessed July 2, 2017).

The calculated distances between 2D and 3D modelling are similar. The central route inbound is clearly the shortest, with Fairchild's route second, and the Via Sebaste third, approximately 45 per cent longer than the Central Route.[23] However, when ascent is factored, the Via Sebaste has the smallest elevation gain, 63 per cent less than Fairchild's route. The denivelation (i.e., distance in elevation between the highest and lowest point of a route) is also significantly lower with the Via Sebaste (1345) as opposed to the Central route (1816) or Fairchild's route (1954). It is evident why the Roman engineers chose this route when they constructed the Via Sebaste in 6 BC.[24] When Naismith's rule is applied to the time of travel, 1.6 days must be added to the Central inbound and 1.4 days to the Via Sebaste. Despite Fairchild's route being 38.4 kilometres shorter, the time of travel is almost one-half day longer than that on the Via Sebaste because of its greater elevation gain.

Trade and religion might have factored into Paul's choice of roads to Pisidian Antioch. Transportation routes usually developed for largely economic reasons along optimal paths that ensured the least cost for moving goods.[25] As Willet and Poblome write about the distribution of the important Sagalassos Red Slip Ware:

> The *Via Sebaste* was the most important connection both to the Mediterranean and central Anatolia and it probably formed the default route for longer distance land based movement of SRSW, in Pisidia and beyond, supplemented with local byways.[26]

So the primary connection for a central Pisidian city like Sagalassos to move its products to the coast was along neither the Central route nor Fairchild's but the Via Sebaste.

Regarding religion as a factor, Fairchild argues that Jews "probably also migrated to other sites farther north up the Kestros River." Paul did visit cities with Jewish communities on his first journey (Acts 13:5, 14, 42; 14:1), so Fairchild attempts to find Jewish *realia* along his proposed route. At Sia, he identified an object in an indistinct relief as a menorah and suggested that the relief may represent someone in a synagogue (Fig. 8).

23 Schnabel, *Acts*, 573, calls the Via Sebaste "the most direct route into the interior." As our data indicates, it is actually the longest of the three routes examined.

24 The route partially utilised the second-century BCE road of Manius Aquillius from Perga to a junction east of Takina. For a brief summary of Roman road building, see Philip Verhagen and Karen Jeneson, "A Roman Puzzle: Trying to Find the Via Belgica Using GIS," in *Thinking Beyond the Tool: Archaeological Computing and the Interpretive Process*, edited by Angeliki Chrysanthi, Patricia Murrieta Flores, and Constantinos Papadopoulos (Oxford: BAR, 2012), 124–25.

25 Irmela Herzog, "The Potential and Limits of Optimal Path Analysis," in *Computational Approaches to Archaeological Spaces*, edited by Andrew Bevan and Mark Lake (London: Left Coast Press, 2012), 179–80.

26 Rinse Willet and Jerome Poblome, "The Scale of Sagalassos Red Slip Ware Production: Reconstructions of Local Need and Production," *Adalya* 18 (2015): 147.

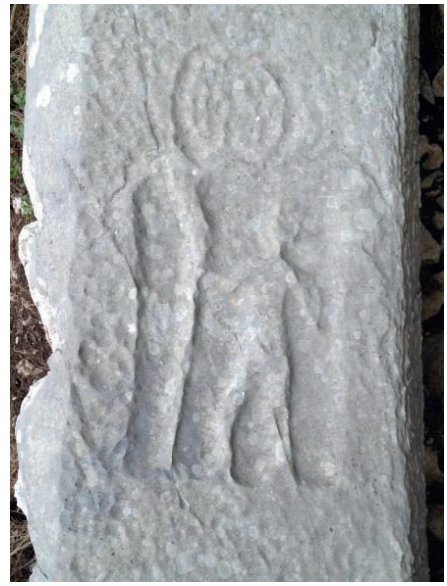

Figure 8: Sia relief (Courtesy of Mark Wilson)

So based on this identification, there was a Jewish presence in the city.[27] However, according to Horsley and Mitchell, Sia's so-called "menorah" situated in the Roman agora is "a relief of a male figure and a tree (Apollo and Daphne?)."[28] At Melli, Fairchild, citing Mitchell, suggests that an apsed chapel "may have been a synagogue or a church."[29] However, Mitchell never suggests that this structure was a synagogue but concludes that this apsed sanctuary was probably designed for monotheistic worship of *theos hypsistos* in a form of "soft monotheism."[30] The only known Jewish inscriptions from Pisidia listed in Ameling's corpus were found at Sidibunda and Termessos.[31] If little evidence of Jewish communities exists along Fairchild's route, there is no compelling reason for Paul to travel on this most difficult of the Taurus crossings.[32]

27 Fairchild, "Why Perga?" 59.

28 G. H. R. Horsley and Stephen Mitchell, *The Inscriptions of Central Pisidia* (Bonn: Rudolf Habelt, 2000), 144; drawing of Roman agora, p. 145 fig. 54. The object above the man standing right is clearly not a menorah in this picture.

29 Fairchild, "Why Perga?" 59.

30 Stephen Mitchell, "Inscriptions from Melli (Kocaaliler) in Pisidia," *Anatolian Studies* 53 (2003): 155.

31 Walter Ameling, *Inscriptiones Judaicae Orientis: Kleinasien*, vol. 2 (Tübingen, Mohr Siebeck, 2004), 449–55.

32 At Sagalassos an oil lamp with a menorah on top was found. Still unpublished, it interestingly has a cross on the bottom. Pieter van der Horst, *Saxa judaica loquuntur: Lessons from Early Jewish Inscriptions* (Leiden: Brill, 2014), 12 n. 50, https://doi.org/10.1163/9789004283237, notes that the excavator Marc Waelkens thinks it is a Christian object, while he concludes "that is in fact quite uncertain."

A final and more convincing reason for Paul's choice of the Via Sebaste is that proposed by Mitchell: "the move from Paphos to Pisidian Antioch was determined in large measure by the fact that Antioch was Sergius Paullus' *patria*."[33] He continues: "It is an elementary inference that he advised or encouraged Paul to make the trip up-country into Asia Minor, following the *via Sebaste*."[34] Milestones discovered along the route indicate that Pisidian Antioch was the *caput viae* of the Via Sebaste. This then was the normal route from the Pamphylian coast to Phrygian Galatia.

Other Factors Related to Time of Travel

This final section will introduce, albeit briefly, several other factors often missing in discussions of ancient travel.[35] Walking was the predominant method of travel during Paul's land journeys, although it is possible that he used a pack animal occasionally. A mule or donkey required the regular provision of fodder and water,[36] as well as protection from predators such as lions and cougars that still roamed the mountains. If pack animals were not used, how would personal items such as clothing, food, and water be carried? Paul's trade (τέχνη) was tentmaker (σκηνοποιός) (Acts 18:3), so he undoubtedly carried a goat-hair tent of his own making. Such a tent provided shelter not only for sleeping, but especially for inclement weather. Beck describes this: "Goat hair woven to form a tent sheet would swell when it became wet, making the shelter water resistant; and it would shrink when it dried."[37] Since Paul's practice was to work in the cities where he preached (cf. 1 Thess 2:9; 2 Thess 3:8; 2 Cor 6:5; 11:23, 27), he would need to carry the basic tools related to his trade. Although *mansios* and *mutationes* could be found along major routes like the Via Sebaste, it is likely that travellers would carry some food supplies with them. Josephus (*B. J.* 3.95) states that Roman soldiers carried provisions for three days with them.

How would such items be transported? Vegetius (*Epit.* 1.19) noted that a Roman soldier was required to carry 60 Roman pounds (20 kg/44 lbs.) besides his weapons in a pack called a *sarcina* (or *fascis*). This equipment comprised four categories: 1) clothing and weapons (*arma*), 2) personal equipment including cooking gear (*vas*), 3)

33 Stephen Mitchell, *Anatolia: Land, Men, and Gods in Asia Minor*, 2 vols. (Oxford: Oxford University Press, 1993), 2:7.

34 Stephen Mitchell and Marc Waelkens, *Pisidian Antioch: The Site and its Monuments* (London: Duckworth/Classical Press of Wales, 1998), 12.

35 For example, F. F. Bruce, "Travel and Communication (NT World)," in *The Anchor Bible Dictionary*, edited by David Noel Freeman (New York, Doubleday, 1992), 6:649–52. The article "Roads and Highways (Roman)" in *Anchor Bible Dictionary*, 5:782–787, is unhelpful for Asia Minor because it discusses only roads in Judea, the Negev, and Arabia.

36 For the fodder needs of such livestock see Jonathan P. Roth, *The Logistics of the Roman Army at War: 264 B.C. to A.D. 235* (Leiden: Brill, 1999), 65–67.

37 John A. Beck, gen. ed., *Zondervan Dictionary of Biblical Imagery* (Grand Rapids: Zondervan, 2011), s.v. "Goat."

tools (*instrumenta*), and 4) rations (*cibus*). Only categories 2 through 4 are included in Vegetius's load of 60 pounds. Clothing and weapons were extra. A food bag was contained in a leather satchel, and a string bag held a skin for holding water.[38] According to a web site on Roman equipment, "[b]ackpacks as we know them were not used by Roman soldiers. On Trajan's Column in Rome, soldiers are depicted (from around AD 100) carrying supplies and either waterskins, or packs, on poles slung over their shoulder. We know they called these poles 'furca' probably after the torture frame of the same name."[39]

Roth, however, disagrees with this assessment, stating that "the Romans developed a standardized method for bearing equipment which functioned in the same way as the modern back pack."[40] Frontinus (*Strat.* 4.1.7) described how this works:

> For the purpose of limiting the number of pack animals, by which the march of the army was especially hampered, Gaius Marius had his soldiers fasten their utensils and food up in bundles and hang these on forked poles, to make the burden easy and to facilitate rest; hence the expression "Marius's mules."[41]

This load was laid on a small board (*tabella*) between the forks. A scene on Trajan's column (Fig. 9) depicts this in one panel. In the rear line soldiers are carrying their gear attached to a pole. On its top a pack (*sarcina*) is shown in great detail with its contents depicted above it. The cross bar mentioned in the literary sources is lacking; however, the position of the sack and satchel show that one must have been present. And as Roth further notes:

> One detail, however, appears to be incorrect: the Roman soldier could not possibly have carried his gear suspended high over shoulder in the manner shown on the column.[42]

It appears that the artist took licence with his depiction because he eliminated the shield to show the *sarcina* more clearly. Each soldier would carry a shield but not on his arm, slung over his back. The *sarcina* would not be held high over the head but balanced on the shield. This would have distributed its weight like a backpack today. Whether travellers like Paul would have carried their personal items in a similar fashion is unknown, but given the similar need, it is likely.

38 Roth, *Logistics of the Roman Army at War*, 73–74. The following sentences summarise Roth's discussion of various military historians who have tried to project what Roman soldiers actually carried.

39 http://romanrecruit.weebly.com/the-marching-pack.html (accessed August 15, 2017).

40 Roth, *Logistics of the Roman Army*, 76.

41 Loeb translation; see N. Fuentes, "The Mule of a Soldier," *Journal of Roman Military Equipment Studies* 2 (1991): 86–89.

42 This discussion summarises that in Roth, *Logistics of the Roman Army*, 76.

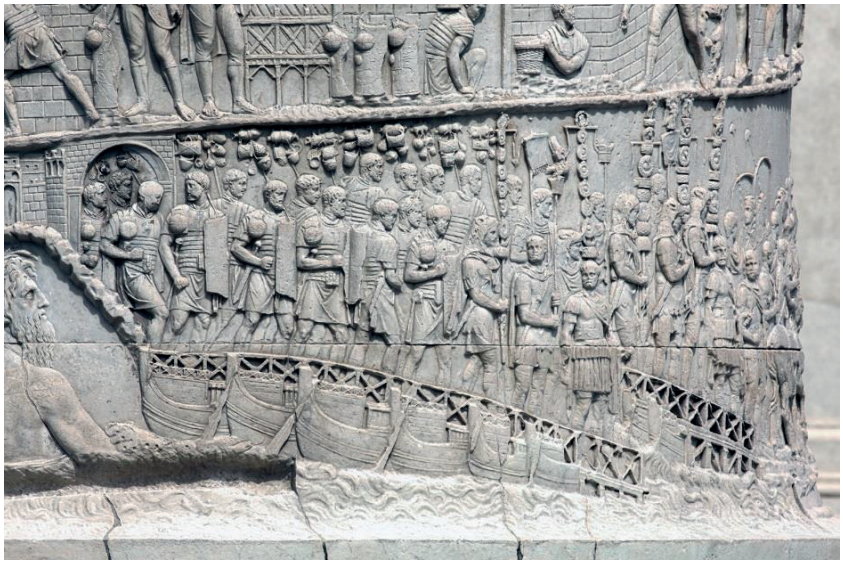

Figure 9: Roman soldiers carrying their gear (Courtesy of Trajan's Column in Rome[43])

Informal and formal studies, particularly from a military perspective, have been done regarding the effect of adding a load above one's normal body weight. Ascribing a small to medium frame to Paul (see below), his estimated weight would be approximately 62 kilograms (136 lbs.).[44] Research findings suggest that a maximum of 15 per cent body weight should be carried in a pack,[45] which in Paul's case would be around 9.3 kilograms (20.5 lbs.).[46] A U.S. military rule of thumb suggests that adding 1 per cent body weight adds 6 seconds per 1.61 kilometres (1 mi.).[47] Adding a pack weighing 15 per cent of body weight would add 90 seconds per 1.61 kilometres. If the average walking distance is 29.6 kilometres per day, 27.59 minutes (29.6 km/1.61 km = 18.39 km x 90 seconds) should be added to each day's travel. Since it is likely that Paul carried such a pack, estimates of travel times should add approximately one-half hour to each day regardless of terrain.

43 This is scene 4 on the column and depicts the Danube crossing: http://www.trajans-column.org/?attachment_id=319 (accessed September 1, 2017).

44 http://www.healthdiscovery.net/links/calculators/ideal_bw_men.htm (accessed June 4, 2017).

45 Angel G. Lucas-Cuevas et al., "Effects of Different Backpack Loads in Acceleration Transmission during Recreational Distance Walking," *Journal of Human Kinetics* 37 (2013): 88–89; https://doi.org/10.2478/hukin-2013-0028.

46 This is less than half of that mentioned by Vegetius and well below the estimates by military historians as discussed in Roth, *Logistics of the Roman Army*, 73–77.

47 http://mtntactical.com/military-athlete-articles/external-loads-walking-speeds-0-70-body-weight/ (accessed August 23, 2017).

Given the modern exercise phenomenon wherein fitness seekers count their steps each day using a device such as a Fitbit, it might be informative to cast Paul's journey in terms of steps. The recommended daily goal is to reach around 10,000 steps, approximately 8 kilometres (5 mi.). A popular walking web site recommends: "An average person has a stride length of approximately 2.1 to 2.5 feet. That means that it takes over 2,000 steps to walk one mile; and 10,000 steps would be almost 5 miles."[48] In antiquity, Jewish men were shorter, averaging around 166 centimetres (65.4 in.). If the description of Paul given in the *Acts of Paul and Thecla* 3 is proximate, he is there described as being "small in size." Paul's estimated height should then be at the lower end of the range, around 160 centimetres (63 in).[49] His step length (x 0.415 cm) would be around 66.4 centimetres (26.1 in.). So for a journey of 265.7 kilometres (26,570,000 cm), he would take 400,151 steps. In contrast, my height is 185 centimetres (73 in.) making my step length 76.77 centimetres.[50] So the number of steps for me to travel the same distance would be 347,099 steps, over 13 per cent fewer steps.

The type of road or track surface also is a factor in travel time. Modern researchers have quantified this as Travel Time Cost Surface Model (TTCSM).[51] Runners are especially concerned how different surfaces influence speed.[52] Walking along preserved sections of Roman roads today makes apparent their uneven road surface and the challenge faced by Paul. Where possible, soft fill material would have been used to smoothen the surface by filling the cracks. Even a properly prepared roadbed, however, would experience upward heaving due to earthquakes and frost, as roads still do today. Ancient travellers had to compensate for various road surfaces including wet and icy ones. However, it is difficult to quantify this in relation to additional travel time.

Two additional climatological factors to consider are rain and wind. I became acutely aware of these during a replication of Paul's walk from Troas to Assos in May 2017. It took place around the same time of year that Paul made his walk around 55 CE. On

48 http://www.thewalkingsite.com/10000steps.html (accessed May 12, 2017). This helps to fulfil the 150 minutes of moderate aerobic activity a week recommended by the Center for Disease Control and Prevention (https://www.cdc.gov/physicalactivity/basics/adults/).

49 This measurement is derived from skeletal remains found in ancient Palestine with a range of 157–171 centimetres; cf. B. Arensburg, M. S. Goldstein, H. Nathan, Y. Rak, "Skeletal remains of Jews from Hellenistic, Roman and Byzantine periods in Israel I: Metric Analysis," *Bulletins et Memoires de la Societe d'anthropologie de Paris* 13th ser., 7, no. 2 (1980): 178, https://doi.org/10.3406/bmsap.1980.3787, and C. S. Spigel, *Ancient Synagogue Seating Capacities: Methodology, Analysis and Limits* (Tübingen: Mohr Siebeck, 2012), 56n29. The average height of American and Israeli males today is 177 centimetres (69.7 in.), hence my height is taller than average. The average height of South African males is 169 centimetres (66.5 in.), so closer to Paul's.

50 https://www.walkingwithattitude.com/articles/features/how-to-measure-stride-or-step-length-for-your-pedometer (accessed August 23, 2017).

51 file:///C:/Users/Public/Downloads/TTCSM.pdf (accessed August 23, 2017); https://www.arcgis.com/home/item.html?id=9c9ca3291b3842efa6775b61c0a5d9d5 (accessed August 23, 2017).

52 http://healthyliving.azcentral.com/surface-affect-fast-person-run-3116.html (accessed August 23, 2017).

two of the three days of the walk our group encountered thunderstorms and strong winds, which delayed or stopped our progress.[53] Unlike Paul, we had a tour bus nearby in which we could seek shelter from the wind and rain. Modern backpackers have developed strategies for hiking in rainy conditions;[54] however, Paul did not have Gore-Tex to waterproof his clothing and equipment.

A related factor is wind, which could especially be encountered in mountain defiles or barren ridges of the Taurus Mountains. The difference between walking with the wind as opposed to walking against it is a familiar experience. As McIlveen writes:

> People find it difficult to maintain their balance in strong gusty conditions, where drag may be flickering widely around 10% of body weight. And it is hard work walking against such winds even when they are steady, as shown by the effective hill slope angle which needs the same muscular effort to progress per unit path length ($\sin^{\pm 1} D/W$).[55]

Elliott summarises: "Heavy rain can swell previously passable streams into uncrossable torrents; low cloud and mist makes route finding difficult and hinders progress. Strong winds slow walkers down, sometimes literally to a crawl."[56] The "cold and exposure" mentioned by Paul (2 Cor 11:27) certainly would result from walking in such inclement conditions. Again, it would be difficult to quantify weather delays in calculating travel times. Yet such delays undoubtedly occurred, despite attempts to travel between spring and fall when weather conditions were more optimal.

Conclusion

This study has presented Paul as an ideal ancient traveller and sought to quantify some of the challenges that such a traveller would face. Attempts to determine travel times and distances have previously relied on 2D modelling. Utilising the methodology of Bekker-Nielsen's 3D modelling, the preferable route for Paul's journey to Pisidian Antioch from Perga has been suggested: the Via Sebaste. Using Naismith's rule, a more accurate way of determining travel times, which incorporates elevation gain, has also been suggested. Other factors, typically not considered in discussions of Paul's travels, have been presented. While the influence of road surface, wind, and rain are difficult to quantify regarding rate of travel, load weight is quantifiable. Since it is likely that Paul carried personal and trade-related equipment on his person, the weight of his "backpack"

53 The effect of rain for walkers in city conditions is the opposite; both male and female pedestrians speed up (http://www.e-penerbitan.org/BTT/2015/217-222.pdf, accessed August 23, 2017).

54 For example, https://www.outdoorresearch.com/blog/article/10-tips-for-making-rainy-backpacking-way-better (accessed August 23, 2017).

55 J. F. R. McIlveen, "The Everyday Effects of Wind Drag on People," *Weather* 57, no. 11 (2002): 411, https://doi.org/10.1256/wea.29.02.

56 Mark S. Elliot, *The Greatest Guide to Walking & Mountain Hiking* (Warwick: Greatest Guides, 2012), 78.

would also influence his travel speed. Though the adjustment to Pauline chronologies might be negligible, nevertheless, incorporating these factors into discussions of ancient travel helps to achieve a more realistic picture of its realities.

References

Ameling, Walter. *Inscriptiones Judaicae Orientis*. Vol. 2, *Kleinasien*. Tübingen: Mohr Siebeck, 2004.

Arensburg, B., M. S. Goldstein, H. Nathan, and Y. Rak. "Skeletal Remains of Jews from Hellenistic, Roman and Byzantine Periods in Israel I: Metric Analysis." *Bulletins et Memoires de la Societe d'anthropologie de Paris* 13th ser., 7, no. 2. (1980): 175–86. https://doi.org/10.3406/bmsap.1980.3787.

Beck, John A., gen. ed. *Zondervan Dictionary of Biblical Imagery*. Grand Rapids: Zondervan, 2011.

Bekker-Nielsen, Tønnes. "Ancient Roads in the Third Dimension." Paper presented at the conference Roads and Routes in Anatolia: Pathways of Communication from Prehistory to Seljuk Times, British Institute in Ankara, Turkey, March 20–22, 2014.

Bruce, F. F. "Travel and Communication (NT World)." In *Anchor Bible Dictionary*, edited by David Noel Freeman, 6: 648–53. New York, Doubleday, 1992.

Currid, John D., and David P. Barrett. *Crossway ESV Bible Atlas*. Wheaton: Crossway, 2010.

Elliot, Mark S. *The Greatest Guide to Walking & Mountain Hiking*. Warwick: Greatest Guides, 2012.

Fairchild, Mark R. "Why Perga? Paul's Perilous Passage through Pisidia." *Biblical Archaeology Review* 39, no. 6 (November/December 2013): 52–59, 84.

French, David H. *Roman Roads & Milestones of Asia Minor.* Vol. 3, *Milestones, Fasc. 3.6 Lycia et Pamphylia*. Ankara: BIAA, 2014.

Fuentes, N. "The Mule of a Soldier." *Journal of Roman Military Equipment Studies* 2 (1991): 65–99.

Herzog, Irmela. "The Potential and Limits of Optimal Path Analysis." In *Computational Approaches to Archaeological Spaces*, edited by Andrew Bevan and Mark Lake, 179–211. London: Left Coast Press, 2012.

Horsley, G. H. R., and Stephen Mitchell. *The Inscriptions of Central Pisidia*. Bonn: Rudolf Habelt, 2000.

Keener, Craig S. *Acts*, 4 vols. Grand Rapids: Baker, 2012–2015.

Lucas-Cuevas, Angel G., Pedro Pérez-Soriano, Michael Bush, Aaron Crossman, Salvador Llana, Juan M. Cortell-Tormo, and José A. Pérez-Turpin. "Effects of Different Backpack Loads in Acceleration Transmission during Recreational Distance Walking." *Journal of Human Kinetics* 37 (2013): 81–89. https://doi.org/10.2478/hukin-2013-0028.

Marek, Christian. *In the Land of a Thousand Gods: A History of Asia Minor in the Ancient World*. Princeton: Princeton University Press, 2016.

McIlveen, J. F. R. "The Everyday Effects of Wind Drag on People." *Weather* 57, no. 11 (2002): 410–13. https://doi.org/10.1256/wea.29.02.

Mitchell, Stephen. *Anatolia: Land, Men, and Gods in Asia Minor*, 2 vols. Oxford: Oxford University Press, 1993.

Mitchell, Stephen. "Inscriptions from Melli (Kocaaliler) in Pisidia." *Anatolian Studies* 53 (2003): 139–61. https://doi.org/10.2307/3643092.

Mitchell, Stephen, and Marc Waelkens. *Pisidian Antioch: The Site and its Monument*. London: Duckworth/ Classical Press of Wales, 1998.

Reisner, Rainer. *Paul's Early Period: Chronology, Mission Strategy, Theology*. Grand Rapids: Eerdmans, 1998.

Roth, Jonathan P. *The Logistics of the Roman Army at War: 264 B.C. to A.D. 235*. Leiden: Brill, 1999.

Schnabel, Eckhard. *Acts*. Grand Rapids: Zondervan, 2012.

Schnabel, Eckhard. *Early Christian Mission: Paul & the Early Church*, 2 vols. Downers Grove: IVP Academic, 2004.

Skeel, Caroline A. J. *Travel in the First Century after Christ with Special Reference to Asia Minor*. Cambridge: Cambridge University Press, 1901.

Spigel, C. S. *Ancient Synagogue Seating Capacities: Methodology, Analysis and Limits*. Tübingen: Mohr Siebeck, 2012.

Talbert, Richard. *Barrington Atlas of the Greek and Roman World*. Princeton: Princeton University Press, 2000.

Thompson, Glen L., and Mark Wilson. "The Route of Paul's Second Journey in Asia Minor: In the Steps of Robert Jewett and Beyond." *Tyndale Bulletin* 67, no. 2 (2016): 217–46.

Van der Horst, Pieter. *Saxa judaica loquuntur: Lessons from Early Jewish Inscriptions*. Leiden: Brill, 2014. https://doi.org/10.1163/9789004283237.

Verhagen, Philip, and Karen Jeneson. "A Roman Puzzle: Trying to Find the Via Belgica Using GIS." In *Thinking beyond the Tool: Archaeological Computing and the Interpretive Process*, edited by Angeliki Chrysanthi, Patricia Murrieta Flores, and Constantinos Papadopoulos, 123–30. Oxford: BAR, 2012.

Willett, Rinse, and Jerome Poblome. "The Scale of Sagalassos Red Slip Ware Production: Reconstructions of Local Need and Production." *Adalya* 18 (2015): 133–47.

Wilson, Mark. "The Route of Paul's First Journey to Pisidian Antioch." *New Testament Studies* 55 (2009): 1–13. https://doi.org/10.1017/S002868850999004X.

Wilson, Mark. "The 'Upper Regions' and the Route of Paul's Third Journey from Apamea to Ephesus." *Scriptura* (forthcoming).