

2009

PREPRINT 384

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Measurement in Jerusalem**

CHRISTIAN PILGRIMAGE AND RITUAL MEASUREMENT IN JERUSALEM*

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Measurement and quantification have often been linked to the rise of rational and scientific thought in early modern Europe. Historians have described the growing importance of number and measure in multiple aspects of European life, political, commercial, and cultural. Both admirers and critics of this new quantifying and rational outlook have marked it as one of the pillars of an emerging modernity, particularly related to the Renaissance and later to the Enlightenment.¹ While the contours of this narrative may be true, the actual transition into a number- and quantity-oriented culture presents more than one interpretative complexity.² The case of measurement as performed during Christian pilgrimage to Jerusalem, which I present in the following pages, may help to reconsider some of the assumptions regarding the quantification process. I demonstrate that in the religious tradition of Christian pilgrimage, measurement and number were uniquely rich cultural symbols, which informed much of the new kind of measurement – precise, systematic – that defined the sixteenth century onward.

In the historiography of Palestine exploration, too, scholars single out the nineteenth century, especially its later half, as a period of unprecedented systematization and accuracy in measurement.³ This narrative has been to a certain extent the fruit of nineteenth-century rhetoric itself. Palestine explorers have used measurement as an ideology to legitimize and authenticate their findings. Edward Robinson, an influential American Bible scholar, clearly opposed his Protestant measuring tape and meticulous topographical study to the spurious traditions first expounded by some Church Fathers and maintained by Catholics and Eastern Orthodox Christians:

The truth is, that the *Onomasticon* of [Eusebius and Hieronymus] is a record of the traditions and opinions current in their day, as to the biblical topography of the Holy City and Holy Land; but these traditions and opinions must be sifted and proved in the same manner as all others. The testimony of these writers, and through them that

* A forthcoming paper in *Micrologus* as part of the special volume *La Mésure*. I would like to thank Rehav Rubin, Ora Limor, Ronnie Ellenblum, Joseph Ziegler, Yamit Rachman-Schrire, Mitia Frumin, and Tania Munz for their helpful suggestions and corrections

¹ A. W. Crosby, *The Measure of Reality: Quantification and Western Society, 1250-1600*, Cambridge 1997. D. Harvey, *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*, Oxford 1989.

² P. Gautier Dalché, «The Reception of Ptolemy's *Geography* (End of the Fourteenth to Beginning of the Sixteenth Century)», in *The History of Cartography, Vol. 3/1, Cartography in the European Renaissance*, ed. D. Woodward, Chicago 2007, 285-364.

³ J. J. Moscrop, *Measuring Jerusalem: The Palestine Exploration Fund and British Interests in the Holy Land*, London 2000. H. Goren, «Sacred, but Not Surveyed: Nineteenth-Century Surveys of Palestine», *Imago Mundi*, 54 (2002): 87-110.

of the Church, cannot surely stand against “measuring tapes” and topographical impossibilities; and just so is it with the testimony respecting the Holy Sepulchre.⁴

It is not for nothing, then, that Robinson has been titled by William Thomson, one of his contemporary admirers and himself a traveler and an author of a well-known geography of Palestine, “the greatest master of measuring tape in the world”.⁵ As historian and literary scholar Hilton Obenzinger notes, Robinson made symbolic use of measurement as when he refused to measure the Holy Sepulcher, a site he did not recognize as genuine.⁶

The point of this article is indeed to present a spectrum of earlier symbolic uses of measurement in the context of religious pilgrimage to Jerusalem.

The rich literary tradition of the grand voyage, of Christian pilgrimage to Jerusalem, contains a perhaps surprising amount of numerical and quantifying observations. Along the way and in the holy places themselves, pilgrims were busy noting down distances, currency exchange rates, expenses, and indulgence years. The fourth-century Bordeaux pilgrim, in the earliest known Jerusalem voyage narrative, carefully notes distances between stations and towns along the route.⁷ Time too, is often measured or counted, whether the number of days in each location, or prayer hours, as the detailed descriptions of Egeria clearly demonstrate.⁸ In other words, numbers are everywhere in pilgrimage accounts, and, we may presume, in the actual journey as well. This is a highly regimented experience, at least in theory, in which procedure and order are to be carefully followed. Quantification thus plays a significant role in structuring the pilgrim’s world.

Arguably the most common measuring practices by pilgrims surrounded the holy sites themselves. Pilgrims were recording distances between points along a procession, most commonly the *Via Dolorosa*, and describing the size of the monuments and their various architectural elements. Let us look at one illustrative example from Johannes Poloner, a pilgrim of the early fifteenth century, who in one dense paragraph captures this quantifying spirit. Describing the tomb of Mary, Poloner notes:

Lastly, beyond the brook, on the left hand, twenty-eight paces down the valley of Jehoshaphat, down forty-eight steps, there is a fair church, wherein is the sepulchre of the

⁴ E. Robinson, «The Reputed Site of the Holy Sepulchre», in Id., ed., *Bibliotheca sacra*, New York 1843, 154-202, 176.

⁵ W. M. Thomson, *The Land and the Book*, London 1861, 234, n. 1.

⁶ H. Obenzinger, *American Palestine: Melville, Twain, and the Holy Land Mania*, Princeton, N.J. 1999, 53. More on modern Protestant involvement in Palestine see in U. Makdisi, «Reclaiming the Land of the Bible: Missionaries, Secularism, and Evangelical Modernity», *American Historical Review*, 102 (1997), 680-713; E. Bar-Yosef, *The Holy Land in English Culture 1799-1917: Palestine and the Question of Orientalism*, Oxford 2005.

⁷ «Itinerarium Burdigalense», in *Itineraria et alia geographica*. Vol. CLXXV, *Corpus Christianorum, Series Latina*. Turnholt 1965, I. Exchange rates are mentioned by the fifteenth-century pilgrim William Wey, *The Itineraries of William Wey, Fellow of Eton College. To Jerusalem, 1458 and 1462; and to Saint James of Compostella, 1456*, London 1857, 1-3. Indulgences are discussed extensively by the fourteenth-century pilgrim Niccolò da Poggibonsi, mentioned below.

⁸ «Itinerarium Egeriae», in *Itineraria et alia geographica*, II, passim.

glorious Virgin Mary, which measures the length of two outstretched arms, and three joints of the middle finger, and has eight lamps continually burning.⁹

We see that Poloner was measuring paces from one monument to another, counting steps and lamps, and actively using his body to measure an individual monument.

This amassing of numbers during pilgrimage and in the holy sites, as we shall see, is typical of pilgrim behavior, and it calls for interpretation. Scholars of the Grand Voyage have indeed paid serious attention to these numbers as a source of quantitative data, usually in an attempt to reconstruct the physical conditions of the journey, the realities of travel, the historical geography of Jerusalem, and the architecture of the sacred monuments. They have emphasized less, however, the acts of enumeration and measurement in themselves. In what follows, I will describe these pilgrim measuring performances and try to understand their significance, both in practice and as a literary element in pilgrim narratives.¹⁰ I will focus mainly, but not exclusively, on the measurement of sacred monuments, and on the narratives of late-medieval and Renaissance pilgrims.

Pious measurement

In this section I discuss the measurement of the holy places in Jerusalem as a pious pilgrim performative act, characterized by multiple layers of meaning and religious connotations. In looking at the measurement of a sacred site, I am less concerned with the actual obtained figures than with the act in itself. It would seem that many pilgrims adopted a similar approach, in which measurement is one among a series of meaningful pious performances related to the sacred sites.¹¹ Indeed, number symbolism – attaching significance to particular numbers – seems to play a very minimal role in pilgrimage.

The religious symbolic value of measuring a shrine appears already in Revelation:

And there was given me a reed like unto a rod: and the angel stood, saying, Rise, and measure the temple of God, and the altar, and them that worship therein. But the court which is without the temple leave out, and measure it not; for it is given unto the Gentiles ... “ (11:1-2, KJV)

Saint John's task here is not to accomplish an exact survey of the Temple, but rather to perform measurement, and thus, as the glossators say, to constitute the true Church. The profane and unholy remain unmeasured, outside the core of the Temple and thus outside

⁹ „Item ultimo (ultra) torrentem a sinistris 28 passus in valle Josaphat deorsum 48 gradus est grata ecclesia, in qua est sepulchrum gloriosae virginis Mariae, habens duo extensa brachia et tres articulos medii digiti, octo lampades assidue lucntes.“ Latin text in T. Tobler, ed., *Descriptiones Terrae Sanctae, ex saeculo VIII. IX. XII. et XV*, Leipzig 1874 (repr. Hildesheim 1974), 225-81, 232-3. I use the translation by A. Stewart in *Library of the Palestine Pilgrims' text Society*; 6, London 1887-97 (repr. New York 1971), 7.

¹⁰ Yvonne Friedman has made a few insightful remarks on the question in her «Sacred and profane in the conception of the Holy Land in the fourteenth century», in Y. Drori, ed., *Eretz Israel in the Mamluk Period*, Jerusalem 1993, 128-141 [Hebrew].

¹¹ On performance as a category for analyzing pilgrimage see J. Feldman, «Constructing a Shared Bible Land: Jewish Israeli Guiding Performances for Protestant Pilgrims», *American Ethnologist*, 34 (2007): 351-74.

the bounds of true religion. In his *Postillae* Nicholas of Lyra interpreted the literal meaning of John's verses in the light of church dedication ceremonies, wherein the bishop rounds the exterior and interior of the church and thereby consecrates it.¹² John's encounter with the angel alludes to similar Old Testament encounters told by prophets Zechariah and Ezekiel.¹³ Christian pilgrims to Jerusalem, as far as I know, did not refer directly to John's measurement of the Temple as prefiguring their own. We may assume, however, that ritual measurement of holy places during pilgrimage was at least indirectly informed by such canonical precedents.¹⁴

However, many pilgrim accounts testify to the devotional aspect of the act of measurement. One of the earliest examples of pious measurement comes from the sixth-century anonymous pilgrim of Piacenza, also called Antoninus. His fairly detailed account pays strikingly close attention to popular pilgrim practices. Hence, describing the column of the flagellation the pilgrim notes that

This column is marked thus: when He [Christ] hugged it, His chest clung to the marble, and His two hands, fingers and palms could be seen in this stone, so that for each illness measures are taken accordingly, which are placed around the neck and bring cure.¹⁵

Similarly, The Piacenza pilgrim tells us that Jesus left a mark on the stone on top of which he stood during his trial.

Many miracles are effected by this stone. People take the measures of this mark and they tie them for each illness, and get well. (23:6).¹⁶

One plausible interpretation of these passages describing the interaction between pilgrim and monument would suggest that the believers placed strings on the imprints of Christ's body. Imbued with healing power, the measured strings were now tied to the body of the pilgrim. We may reasonably presume, although the pilgrim does not state so explicitly, that different measures were taken for different illnesses. The Piacenza pilgrim's words may also lend themselves to other explanations, involving other methods of copying and transmission – wax, paper, or stone. However, the guiding principle of these actions remains one: the stone records an exact imprint of Christ's body, which the pilgrims touch,

¹² *Bibliorum sacrorum cum glossa ordinaria*, Venice 1603, v. 6.

¹³ Zecharia 2:1-2: „I lifted up mine eyes again, and looked, and behold a man with a measuring line in his hand. Then said I, Whither goest thou? And he said unto me, To measure Jerusalem, to see what is the breadth thereof, and what is the length thereof.“ Ezekiel 40:3 : „...there was a man, whose appearance was like the appearance of brass, with a line of flax in his hand, and a measuring reed...“.

¹⁴ Edward Robinson, in avoiding measurement of the Holy Sepulcher did follow, in a way, the angel's command.

¹⁵ „In qua columna tale est signum: dum eam amplexasset, pectus eius inhesit in ipsa marmore et manus ambas apparent et digiti et palme in ipsa petra, ita ut pro singulis languoribus mensura tollatur exinde; et circa collum habent et sanantur“. C. Milani, ed., *Itinerarium Antonini Placentini: Un Viaggio in Terra Santa del 560-570 d.C.*, Milano 1977, 21:5 (early recension).

¹⁶ „Nam de ipsa petra [on which Jesus stood during his trial] multae fiunt virtutes; tollentes mensuram de ipso vestigio et ligant per singulos languores et sanantur“. Milani, *Itinerarium*, 23:6 (early recension).

often imitating Christ's original position in relation to the monument. The pilgrims then record as precisely as possible the monument and carry this record in a physical or numerical form.¹⁷

The narrative of the early-twelfth-century Russian pilgrim, the monk (or abbot) Daniel contains other clear instances both of Christ's body as a measuring standard and of the ritual dimension of measurement. In his description of the Holy Sepulcher, Daniel plainly records architectural configurations and dimensions:

And the Church of the Resurrection is circular and in length and breadth it is 30 fathoms. In it there are spacious rooms in the upper part and here lives the Patriarch. And from the doors of the cave to the wall of the great altar it is 12 fathoms.

Daniel notes however another telling detail:

Beyond the wall behind the altar is the navel of the earth and a vault has been built above it and high up is depicted Christ in mosaic and a scroll which reads: 'Behold I have measured heaven and earth with my hand.'¹⁸

The pilgrim's own measures and very act of measurement acquire a new meaning in light of Christ's role as measurer and architect of heaven and earth. The inscription (directly alluding to Isaiah 40:12, and echoing Wisdom 11:21) utilizes the proximity of the tomb and the navel of the earth, and thus Christ's body and the cosmos collapse into one another, which is a common feature in *mappaemundi* as well.¹⁹ In this particular context, the pilgrim not only records measures related to the Christ's tomb, but also replicates Christ's cosmic measuring action on a microcosmic level.²⁰

Another passage in Daniel's text recounts his privileged access to the tomb, following the ceremony of the Holy Fire. The Russian monk arrived to collect the lamp which he had left on the tomb during the ceremony, by special permission of Prince Baldwin. He was allowed by the keeper to enter the place alone, where he saw his lamp burning with the miraculous light.

[A]nd bowing down before the holy tomb and kissing with love and tears the holy place where the most pure body of Our Lord Jesus Christ lay, I then measured the tomb in length and breadth and height, for when people are present it is quite impossible to measure it. And having honored the tomb of the Lord as best I could, I

¹⁷ See also E. Kitzinger, «The Cult of Images in the Age before Iconoclasm», *Dumbarton Oaks Papers*, 8 (1954): 83-150, 105-6. On the importance of sight and touch see G. Frank, *The Memory of the Eyes: Pilgrims to Living Saints in Christian Late Antiquity*, Berkeley, CA 2000, 118-133.

¹⁸ «The Life and Journey of Daniel, Abbot of the Russian Land», in J. Wilkinson et al., eds., *Jerusalem Pilgrimage, 1099-1185*, London 1988, ch. 10, 128.

¹⁹ „Who hath measured the waters in the hollow of his hand, and meted out heaven with the span, and comprehended the dust of the earth in a measure, and weighed the mountains in scales, and the hills in a balance?“ (Isaiah 40:12); „but thou hast ordered all things in measure and number and weight“ (Wisdom 11:20[21 Vulgate]). On *mappaemundi* see, among others, E. Edson, *Mapping Time and Space: How Medieval Mapmakers View Their World*, London, 1997.

²⁰ See more in C. Morris, *The Sepulchre of Christ and the Medieval West: From the Beginning to 1600*, Oxford 2005, 26-27.

gave the keeper of the key a small present and my poor blessing. And he, seeing my love for the Lord's tomb, pushed back for me the slab which is at the head of the holy tomb of the Lord and broke off a small piece of the blessed rock as a relic and forbade me under oath to say anything of this in Jerusalem.²¹

Measurement for Daniel is, on the one hand, a practical task that requires unhindered access to the monument. It can only be performed when the tomb is empty of other believers. On the other hand, this very solitude in the presence of the monument allows a special kind of devotion, of which measurement is part. The Holy Fire narrative is structured around Daniel's privileged access, being allowed first to leave his lamp, then to enter the tomb alone, measure and honor it, and finally, to receive a broken chip of the monument itself. Measurement is part of a process of engagement with the monument, honoring it, appropriating it, making it one's own by recording and preserving its materiality. It is again measuring rather than the actual measurements that is at stake.

The uniquely rich description of Felix Fabri, a Dominican Friar of Ulm who traveled twice to the Holy Land in the late fifteenth century, provides us with ample evidence for the continuation of measurement as religious performance within pilgrimage. As a pilgrim of the learned kind, Fabri gathered as much information about his voyage, from books and fellow pilgrims alike. For the description of the Holy Sepulcher, Fabri wrote, he made use of an account by Johannes Tucher of Nuremberg, who had visited the place in 1479, one year before Fabri's first voyage. Tucher, according to Fabri,

[E]xamined the Lord's sepulchre with the most minute care, and took its measurements with his hands, feet, and outstretched arms. I had his account of it with me at Jerusalem, and found all that he had written concerning the Holy Sepulchre to be true; wherefore I have translated it from the German tongue into Latin, and have inserted it into my Book of Wanderings, as being a really true description, and written by a respectable and truthful man.²²

Fabri is fully committed to a true description of the monument. And yet, Tucher's authority in Fabri's eyes does not arise from his special instrumentation or meticulous technique,

²¹ «The Life and Journey of Daniel», ch. 97, 170-171.

²² „Pro quo notificando accipio descriptionem, quam honestus vir Johannes Tucher, civis Norimbergensis, confecit in lingua theutonica de dominico sepulchro, qui anno 1479, uno videlicet anno ante meum primum introitum, fuit multis diebus in Jerusalem, et dominicum tumulum curiosissime inspexit, et manibus, pedibus, digitis, et extentis brachiis mensuram ejus accepit. Cujus quidem descriptionem mecum in Jerusalem habui, et per omnia, sicut scripsit de sancto sepulchro, sic inveni. Ideo eum de theutonica scripsit de sancto sepulchro, sic inveni, et evagatorio meo inserui, uti veram et a viro maturo et veraci confectam.“ K. D. Hassler, ed., *Fratri Felicis Fabri Evagatorium in Terrae Sanctae, Arabiae et Egypti peregrinationem*, Stuttgartiae 1843, 1:327-328. I use the translation in *The Book of Wanderings of Brother Felix Fabri*, 5v., trans. A. Stewart, London 1896. Fabri then explains how he translates Tucher's German measurement units into Latin (Klaftern=Cubit, etc.). On similar measuring practices by Gabriel Pécsvárad, a Hungarian Franciscan traveling in the early sixteenth century see Y. Porat, «A Hungarian Pilgrim in the Holy Land», MA thesis, Hebrew University, Jerusalem, 2007 (Hebrew). For the fullest treatment of Fabri's pilgrimage within the context of his wider literary work see K. Beebe, «Reading Mental Pilgrimage in Context: The Imaginary Pilgrims and Real Travels of Felix Fabri's 'Die Sionpilger'», *Essays in Medieval Studies*, 25 (2008): 39-70.

but rather from his respectability and devoutness. Tucher, we read in Fabri, performed just what the pilgrim of Piacenza and Daniel the Russian monk had before him – an unmediated approach to the sacred stone and its measurement with one own's body. Fabri's use of Tucher's measurements thus point to the communal character of pilgrimage and its ceremonial practices. Tucher's respectability and truthfulness have more to do with his devoutness than with the accuracy of his figures.

Fabri's engagement with other sacred sites is in accordance with this pattern. In Sinai Fabri and a few companions reached the summit of Mount Catherine (the highest in the peninsula at 2642m), where the saint's body lay, until, according to tradition, it was transferred to the nearby monastery:

We bowed ourselves to the earth before the place in which the virgin lay, and placed ourselves therein, not out of presumption or curiosity, but out of piety. We measured our bodies against the form of the hollow, and inferred that she must have been of tall stature.²³

Fabri relates a very similar encounter on the Mount of Olives, where a stone wall was believed to bear the imprint of Christ's body.

So we bowed ourselves down round about this rocky wall, and, after we had said our prayers, rose up, and one after another went up to the place and laid our bodies, as far as we could, in the holy imprint, putting our arms, hands, face, and breast into the hollow, and measuring it by our own figures.²⁴

The pattern is clear. A miraculous imprint in the stone, recording a sacred event or person, calls for adoration, which includes prostration and also measurement by physical imitation of the position recorded. As Yamit Rachman-Schrire notes, here is a case of "not merely copying but rather enacting Christ's figure."²⁵ *Commetior*, the verb Fabri uses in these two paragraphs signifies not a simple measurement but the creation of a common measure, of symmetry and proportion. The pilgrim's body becomes commensurate with the sacred stone. That units of weights and measures at the period were predominantly anthropomorphic is significant, in preserving a permanent cultural affinity between the human body and the world.

Being too accurate and attached to figures could make a pilgrim suspect of "presumption or curiosity" – the words used by Fabri in Sinai. But there is evidence that some pilgrims made a pronounced effort to provide as accurate figures as they could. A well-known

²³ „Ad loculum ergo virginis nos prostravimus et in ipsum non ex praesumptione vel ex curiositate, sed ex pietate nos posuimus et corpora nostra commensuravimus cavaturae et ipsam longae staturae fuisse deprehendimus. Demum dum locum illum sanctum debito vel nobis possibili honore venerati fuissimus, convertimus nos ad alia.“ Fabri, *Evagatorium*, 3:467.

²⁴ „Est autem petra illa adeo dura, quod incisioni videtur inepta, et nullis ferramentis quidquid deponi potest. Circa hunc igitur parietem prostravimus nos, et orationibus dictis surreximus, et singuli unus post alium accessimus, et sacrae impressioni corpora nostra, prout potuimus, induximus, brachia, manus, vultum, et pectus concavitati imponentes, nos ipsos ipsi figurae commensurantes.“ Fabri, *Evagatorium*, 1:382.

²⁵ Y. Rachman-Schrire, «*Evagatorium in Terrae Sanctae: Stones telling the Story of Jerusalem*», in A. Hoffmann and G. Wolf, eds., *Jerusalem as Narrative Space*, forthcoming.

example is that of Niccolò da Poggibonsi, who made the voyage in the mid-fourteenth century. His account, giving the most detailed calculations of indulgences attached to the sacred sites of Palestine, was printed many times under another's name in later centuries. Niccolò was as careful about the quality of his information and measurements as he was about indulgence years:

And what I saw with my eyes and touched with my hands and asked of others, and when I was well certified of the things, that I wrote on two small tables, which I carried by me. Later, when I was in Jerusalem, I procured a measure of one braccio, with one of one foot, and going my rounds, I measured everything in order, as herein you will hear: the area, the length, and the breadth, and I at once wrote them down.²⁶

It is significant that the pilgrim obtained his measuring standards, a braccio and a foot, in Jerusalem itself. Were these items in regular demand, catered for by the local pilgrimage industry (like tattoos, holy water and other objects)?²⁷ We may only speculate here. Other authors, in later centuries, printed a 1:1 measure unit, according to the standard they had used. In the late sixteenth century Christian van Adrichem produced very influential textual and cartographic studies on the sacred topography of Jerusalem, despite never having visited Palestine. In *Urbis Hierosolymae descriptio* (1588) he provided a detailed and measured description of the *Via Dolorosa*, based on pilgrim reports, and took care to print a quarter foot according to the measure that he used.²⁸ The noble Bolognese Vincenzo Favi, whose "Relatione del Viaggio di Gerusalemme" [1615], remains in manuscript, provided at the end of his account a half foot divided into six inches.²⁹ These graphic length standards were practical tools for the informed reader who may have been interested in constructing an accurate image of the sites. At the same time, these authors use these standards as symbols of spiritual authenticity and as a means to building a communal link with their readers, as in the case of Fabri and Tucher.

So far I have discussed the various meanings of measurement and quantification during pilgrimage as it relates to the individual pilgrim on site. However, number and measure were also important for individual prayer cycles in the context of vicarious pilgrimage. The notion of mental pilgrimage, of spiritually rather than physically visiting the shrines, is almost as old as Christian pilgrimage itself.³⁰ Monks and especially nuns were encouraged to make this kind of pilgrimage and evade the mortal and moral dangers along the way. Laymen, too, especially in late medieval Europe, \ engaged in vicarious pilgrimage using

²⁶ Niccolò da Poggibonsi, *A Voyage beyond the Seas, 1346-1350*, trans. T. Bellorini and E. Hoade, Jerusalem 1945, 11.

²⁷ M. Lewy, «Towards a History of Jerusalem Tattoo Marks among Western Pilgrims», *Cathedra* 95(2000): 37-66 (Hebrew). (also in *Zeitschrift für Religions- und Geistesgeschichte*, 55(2003): 1-39).

²⁸ See text and translation in J. Van Heerwarden, *Between Saint James and Erasmus: Studies in Late Medieval Religious Life: Devotion and Pilgrimage in the Netherlands*. Trans. W. Shaffer and D. Gardner, Leiden 2003, ch. 3, 84.

²⁹ British Library, MS Add. 33566, f. 158a.

³⁰ B. Bitton-Ashkelony, *Encountering the Sacred: The Debate on Christian Pilgrimage in Late Antiquity*, Berkeley, CA 2005. G. Constable, «Opposition to Pilgrimage in the Middle Ages», *Studia Gratiana*, 19 (1976): 125-46.

guides, maps, and full-scale reconstructions, which I discuss below. The influential *Spiritual Pilgrimage of Hierusalem* (Dutch, 1563), by the Flemish Carmelite Jan Pascha (d. 1539) – a work modeled on and informed by contemporary pilgrim narratives – offered a year-long devotional plan with detailed and precise daily instructions for prayer and meditation. Like pilgrim narratives, Pascha’s meditations are often informed by number. For example, the praying reader is asked to imagine his embarkation in Venice on a ship bound to the Holy Land:

The lord of this shippe must be Saint Peter, to whom comende thyselfe. Thou must agree to give the Patrone of the Galy, fiftie Ducats of gould for thy passage, which are 50 Paters, and 50 Aves. or some other.³¹

In Pascha’s text, the hardships of the voyage, which pilgrims often liked to elaborate on, turn into a number-oriented prayer. Thus the notorious tough bargaining with the Venetian ship captain over sleeping conditions and food rationing turns into an element of devotion. On the 207th day of the cycle Pascha informs the reader that

the Crosse was. 15. foote longe and 8. foote over thwart. and it weighed, 150. pounce waight. [...] and from the place where the Crosse was laied on him [Christ] to the place where he first fel, are 40. strides, and every stride conteineth two comon paces, or six foote. [...] There went with our Lord to Mount Calvaries 15000 parsons.³²

This number-rich paragraph suggests that in Pascha’s mind, recitation and contemplation of measures, especially measures related to sacred sites and histories, was an effective aid for devotional regulation and focus. The *Stations de Jérusalem*, another widely-circulated work in this tradition, was published by the Jesuit missionary Adrien Parvilliers in the mid seventeenth century and was remarkably successful well into the nineteenth century.³³ The *Stations* is a short devotional text designed as a practical guide for meditation on the passion of Christ by evoking the sacred sites in Jerusalem.³⁴ Parvilliers leads the reader along the *Via Dolorosa*, counting steps between the stations, and suggesting themes for contemplation and prayers at each one. While the Christian reader, according to Parvilliers, could practice his devotion almost anywhere (even the garden or the open fields would be appropriate), Parvilliers himself, as the subtitle of his work suggests, “verified everything on location.” However, this mode of quantitative piety, despite “verification” on site, had only little to do with historical veracity. In Pascha’s and Parvillier’s devotionals,

³¹ Jan van Paeschen, *The spiritual pilgrimage of Hierusalem, contayninge three hundred sixtie five dayes iorney wherin the deuoute person may meditate on sondrie pointes of his redemption. With particular declaration of diuers Saints bodies and holy places which are to be seene in the said-voyage: As also sundrie deuout praiers and meditations verie healpful to the pilgrimes ...*[Douai] 1605, 40th day, 21-22.

³² Paeschen, *The spiritual pilgrimage*, 104. Pascha then indicated (127) that “6666 (or as some maintain, 5475) was the number of wounds Christ received”.

³³ I have used *Les Stations de Jérusalem, pour servir d’entretien sur la Passion de Notre Seigneur Jésus Christ, par le R. P. Parvilliers de la Compagnie de Jésus, qui a vérifié le tout sur les lieux*, Paris 1874.

³⁴ Loyola, who made the pilgrimage to Jerusalem in 1523, had plans to remain in the Holy Land, but was ordered to leave by the Franciscans.

quantification provided mnemonic signposts as well as structure and discipline to the vicarious pilgrim following Christ.

Quantified celebrations of the sacred topography of Jerusalem were not only individual but often public and well integrated into the liturgical year in Europe, especially during Easter. Niccolò da Poggibonsi explained why he had troubled himself about recording and measuring so faithfully and accurately:

[F]irstly, many who have a great desire to visit the holy places, poverty impedes; and others abandon it, for the too great fatigue; and others again for want a permission, which must be had from the Pope.

Thus one of the main motives for taking exact measures during pilgrimage was the desire to physically replicate Jerusalem in Europe for the sake of those who could not make the Grand Voyage.³⁵ Since late antiquity, bringing back home sacred mementoes such as water, chips broken off monuments, relics, and images was a universal pilgrim habit. The recording and depiction of the holy places was part of that devotional practice, aimed at the community back home. Bishop Arculf, whose account of the holy places was written by Adamnan (c. 670), supplied plans of the Holy Sepulcher with measures in feet and palms.³⁶ Saint Petronius, the fifth-century bishop of Bologna, According to his twelfth-century *Vita*, measured the Holy Sepulcher with a rod and then designed the monastery and church of San Stefano accordingly.³⁷ In the fifteenth and early sixteenth centuries there was a real surge of replicating Jerusalem in images, sculptures, and architecture and integrating these material elements into the local liturgies of churches and brotherhoods. In Florence, Leon Battista Alberti designed for Giovanni Rucellai a miniature marble Holy Sepulcher in the church of San Pancrazio, based on pilgrim reports.³⁸ In 1487 began the building of the *Sacro Monte* of Varallo, which in the following decades inspired other such shrines recreating the Passion in a fabricated Jerusalem, such as San Vivaldo in Tuscany.³⁹

³⁵ R. G. Ousterhout, «Loca Sancta and the Architectural Response to Pilgrimage», in Id. ed., *The Blessings of Pilgrimage*, Urbana 1990, 108-24. Id. «Architecture as Relic and the Construction of Sanctity: The Stones of the Holy Sepulchre», *Journal of the Society of Architectural Historians* 62 (2003): 4-23.

³⁶ *Patrologia Latina*, 88: cols. 779-814.

³⁷ H. Thurston, S.J., *The Stations of the Cross: An Account of their History and Devotional Purpose*, London 1906, 8. C. Morris, «Bringing the Holy Sepulchre to the West: S. Stefano, Bologna, from the Fifth to the Twentieth Century», in R. N. Swanson, ed., *The Church Retrospective*, Studies in Church History; 33 Woodbridge 1997, 31-60, demonstrates that the *Vita* of St. Petronius reflects contemporary Crusader ideals and is not a reliable source for the early history of San Stefano.

³⁸ A. Grafton, *Leon Battista Alberti: Master Builder of the Italian Renaissance*, Cambridge, MA 2000), 322.

³⁹ C. Morris, «Pilgrimage to Jerusalem in the Late Middle Ages», In Id. and P. Roberts, eds., *Pilgrimage: The English Experience from Becket to Bunyan*, Cambridge 2002, 141-63, 154, with further examples of churches and Jerusalem brotherhoods. See also K. Rudy, «Northern European Visual Responses to Holy Land Pilgrimage, 1453-1550», Ph.D., Columbia University 2000, 124. B. Dansette, «Les pèlerinages occidentaux en Terre Sainte: une pratique de la Dévotion Moderne à la fin du Moyen Age? Relation inédite d'un pèlerinage effectué en 1486», *Archivum Franciscanum Historicum*, 72 (1979): 106-33, 330-428.

The fresh technology of print offered new possibilities for replicating a sacred object as an image.

The role of measurement and numerical repetition in image and ritual became more pronounced in the late fifteenth century, as the *Via Crucis* – the route from Pilate’s House to Calvary – began to assume a special status. Measuring the distance between the stations was an act of piety in itself, and a service to fellow believers back home, who could not travel to Jerusalem. An early measurement of the route appears in Poloner’s account of 1422.

And it should be noted that from the place of Calvary to the aforesaid judgment-hall is four hundred and fifty paces, which I counted with the greatest care that I could.⁴⁰

Aranda, the guardian of the Franciscan friary at Alcalà, stayed for a long period as a guest on Mount Sion, and reported 1,862 ‘passos’. Martin Ketzler, who sponsored the famous stations erected at Nuremberg, had lost his measurements from a first journey (c. 1468) and undertook a second a few years later to recover the data. In Seville, Don Fadrique Enríquez de Ribera (1476-1539) built the “Casa de Pilatos” based on measurements from a pilgrimage he undertook in 1520.⁴¹

Published pilgrim narratives during the sixteenth century multiplied and developed into a characteristically early modern genre, enriched by both the technology of print and the humanistic and antiquarian styles that dominated erudite Europe. Devout pilgrims were eager to describe their Mediterranean journey and, in the manner of secular *Isolarii*, to pay close attention to classical antiquities and myths. Jean Zuallart’s popular account is a good example, containing references to Vergil, Ovid, and descriptions of Greek and Roman antiquities.⁴² The accurate tabulation of monuments in text and image was also a marked characteristic of the antiquarian movement. Indeed, Zuallart became equally famous for his detailed and precise images – maps, views, architectural plans – that were immediately copied by many others.⁴³ Thus the exact measurement and documentation of the sites in the Holy Land developed significantly in this period as part of these general trends. If a measuring Fabri had to clear himself of the charge of curiosity, the new antiquarian-pilgrims saw their number-oriented curiosity as a sign of devotion in itself.

I would like to discuss now the foremost representative of this trend, the Franciscan Bernardino Amico of Gallipoli, the author of the richly illustrated *Trattato delle piante &*

⁴⁰ “Et est notandum, quod a loco Calvariae usque ad idem praetorium sunt cccl passus, quos omni diligentia, qua potui, numeravi.” Tobler, *Descriptiones Terrae Sanctae*, 229.

⁴¹ Thurston, *The Stations of the Cross*, 56-57. See A. Wunder, “Classical, Christian, and Muslim Remains in the Construction of Imperial Seville (1520-1635),” *Journal of the History of Ideas*, 64 (2003): 195-212, on the “Casa de Pilatos” in Seville. Bernardino Amico (discussed below) counted 940 paces, 34 (30). Parvilliers measured 700 steps. *Les Stations de Jérusalem*, 99-100.

⁴² J. Zuallart, *Il Devotissimo viaggio di Gerusvsalemme*, Rome 1587. Second expanded edition in French: *Le tresdeuot voyage de Ierusalem*, Antwerp 1608.

⁴³ In the preface to the French edition Zuallart told the reader that it was an angel rather than his talent who guided him in the process, for he had only three or four months to take drawing lessons in Rome prior to leaving („guidée plustost d’un bon Ange, que de ma science, comme n’ayant par occasion mis que trois ou quatre mois, avant partir de Rome, pour apprendre un petit à craionner“). Zuallart, *Le tresdeuot voyage*, sig. *3v.

imagini de sacri edificii di Terra Santa. Not much is known about Fr. Amico beyond the information in his treatise.⁴⁴ In 1593 Amico arrived in the Holy Land and moved between various posts in the Franciscan hierarchy. He served a six-month term as the Guardian in Bethlehem and in 1596 was appointed President of the Holy Sepulcher. A year later Amico was sent to Egypt, where he was chaplain to the merchant community in Cairo. He left the Holy Land for Italy in 1598. In between official duties Amico engaged in systematic architectural surveys of the main holy sites in Jerusalem and Bethlehem, which were printed as the *Trattato* Raimondi's *Typographia Linguarum Externarum* in 1609 and illustrated by the artist and Antonio Tempesta.⁴⁵ In 1620 a second, expanded and more elegant edition came out from Pietro Ceconcelli's press in Florence.⁴⁶ The new edition was illustrated by the French engraver Jacques Callot (c.1592-1635) and dedicated to Cosimo II (Florence, 20 November, 1619), who may have been the instigator of reprinting the *Trattato*.⁴⁷

Amico's *Trattato* consists of systematic and accurate documentation of Christian traditions and monuments. It is uniquely and without precedent a commented architectural survey of the Christian Holy Land, guided by a visual rationale and lacking a narrative or chronological backbone. It emerged from Raimondi's learned press in Rome, in collaboration with Tempesta, a leading artist-antiquarian, and was thus a product of the same milieu that produced at this exact period major works of sacred scholarship. In that capacity, the *Trattato* is a learned treatise on the Holy Land, more akin to Boniface of Ragusa's study of the rite of the Holy Land (1573), than it is to the personal pilgrim narrative.⁴⁸ Finally, as a Franciscan publication surveying Franciscan-controlled

⁴⁴ The following information is based on Bellarmino Bagatti's useful preface and notes to the 1953 English translation, B. Amico, *Plans of the Sacred Edifices of the Holy Land*, trans. T. Bellorini and E. Hoade, Jerusalem 1953, henceforth 'Amico 1953'. For a few complementary details see the commentary by Robin Halwas to the electronic facsimile of Amico, trans. D. Sullivan, Oakland, CA: 1999, which reproduces the Bridwell Library copy of the second edition (1620). References will be made to the translation of the Octavo edition (and to page numbers of the original).

⁴⁵ Among numerous other prints, Tempesta produced a map of ancient Jerusalem (1601) based on Adrichem. He is better known for his 12-sheet map of Rome (1593 and further editions).

⁴⁶ The full title of the second edition: "Treatise on the Plans and Images of the Sacred Edifices of the Holy Land. Drawn in Jerusalem according to the Rules of Perspective and the True Measure of their Size. By R.P.F. Bernardino Amico of Gallipoli, of the Order of St. Francis of the Observant Minor Friars. Printed in Rome and newly reprinted by the same author in a smaller format with the addition of the *Via Dolorosa* and other sketches."

⁴⁷ After Raimondi's death in 1614 the Press ceased its operation and Raimondi's material was kept by the Medici family. For the new edition the rights were transferred to the newly established press of Ceconcelli. Callot entered Medici patronage in 1614 after being hired by Tempesta in 1611 to etch paintings and decorations. In 1620 Callot produced another pilgrimage-related piece, "The Fair at Impruneta," showing pilgrims to the Madonna of Impruneta, near Florence. D. Freedberg, *The Power of Images: Studies in the History and Theory of Response*, Chicago 1989, 107.

⁴⁸ Bonifacius Stephanus, *Liber de perenni cultu Terrae sanctae et de fructuosa ejus peregrinatione*, Venice 1573. Bonifacius was a powerful Guardian of the Holy Land during the 1550s and undertook a major reconstruction of the tomb of Christ.

monuments (and memories), Amico's text could also be seen as an early example of promotional monastic mapping and documentation. In the person of Bernardino Amico the pilgrim and the scholar coalesced into one. Amico explicitly appealed to the "devout and curious" reader – a reader, we may assume, who would have appreciated a pious presentation of an in-depth study with carefully executed images.⁴⁹

We do not hear much about Amico's working methods, the kinds of instruments he used, or how he recorded his data. Obtaining measurements in the most important locations – Bethlehem and the Church of the Holy Sepulcher, where Amico served as the Franciscan supervisor – should have been fairly easy. In other locations, such as the first station of the *Via Dolorosa* ("Pilate's Palace"), which was inside the Ottoman governor's residence, Amico could only gather sketchy information.⁵⁰ A Corsican convert to Islam helped Amico with measurements of the Dome of the Rock, which were later confirmed by other Muslims.⁵¹

Amico's detailed images and commentaries, full of concrete quantitative information, were designed to enable the reader to reproduce the holy places, either mentally or physically. For example, the dramatically foreshortened perspective of the Nativity complex in Bethlehem came with special viewing instructions for making the image "appear in relief, just as though it were made of solid matter." Strolling with one eye closed along the various sections of the Nativity complex, the reader would have experienced the desired effect, as if one were holding a model of the site and examining its different inner passages.⁵²

The Church of the Holy Sepulcher with the internal Edicule above the tomb of Christ – renovated in 1555 – received Amico's most careful attention. Having presented the special plan and then the elevation of the Edicule, Amico provides an image which juxtaposes the two. The image is prefaced by a paragraph which captures the essence of Amico's project as a whole.⁵³ The aim of this detailed account – in some cases down to half

⁴⁹ Amico, 57 (55).

⁵⁰ The Guardian Francesco de la Salandra sent Amico to see the governor on several occasions. Amico used the opportunity to observe the hall in which Jesus was said to have been tried and where "justice is administered [...] to this day." Amico, 28 (24).

⁵¹ "But since the common report is true, that any Christian found entering this temple or even its square must necessarily become a Turk or die, having been unable to take its measurements myself, I had them taken by an apostate Corsican. Moreover, several Turks with whom I compared them confirmed them to me: they were taken with the most exquisite care." 51 (47).

⁵² Amico, 12 (7).

⁵³ I quote it here at length: "Reason and duty would have demanded that each part of these venerable and holy places should have received their profile drawn in perspective according to the rules of architecture. But I have omitted this in order not to swell my book; nonetheless, experienced architects will be able in each instance to reconstruct the whole from the plans and what I have written. But I have not wanted to make any omissions in this plan of the Most Holy Sepulchre, for the benefit of simple artisans so that, if one of them wishes to build anything with the authority of one seeing it, he may be able to do so with every ease, using the scale, from which they will find every detail." Amico, 49 (45). The legend on the plate reads: "Plan and elevation of the Most Holy Sepulchre in cross section, so that anyone may use its scale and build it of whatever material desired without too much labor."

minutes (~2mm) – was to provide a working scheme for anyone, including “simple artisans,” who wished to build a model of the Sepulcher. The less detailed plans could still serve “experienced architects [...] to reconstruct the whole from the plans and what I have written.” Amico certainly had careful readers in mind, whether artisans or architects, “who delight in the use of the compass,” and who would measure his plan according to the scale he provided.⁵⁴

Amico’s plans and numbers were indeed put to use. As Bagatti conjectures, it was probably Amico himself who initiated in Bethlehem a local industry that produced complex models of the Holy Sepulcher and the Church of the Nativity, made of olive wood set in mother of pearl. Amico’s measurements may well have been taken initially for that purpose.⁵⁵ We know, moreover, that the building of at least one real church made direct use of Amico’s plans – Patriarch Nikon, the controversial Russian reformer, consulted Amico’s book for the reconstruction of the Holy Sepulcher and other holy places at his New Jerusalem monastery near Moscow, founded in 1656.⁵⁶

On the one hand, Amico is the innovative antiquarian (a perfectly sensible term in the sixteenth century), who used complex textual and visual documentary techniques and applied them to sites that until his time had been measured by amateurs. Amico performed in Jerusalem what countless local erudites and learned travelers had been doing since the early fifteenth century in Rome (e.g. obelisks), Constantinople (Hagia Sophia), or Cairo (the Pyramids).⁵⁷

On the other hand, Amico is engaged not only in precise architectural documentation, but also in the tradition of pious counting as discussed above. Amico, for example, repeats Pascha’s numbers with the same kind of meditative number-oriented oration:

Scholars say that he [Christ] received six thousand six hundred sixty-six blows. And after a cross of fifteen palms in length and eight in width, a good palm in thickness, was placed on his flayed and bloody shoulders, consider the wolfish charity by which they were moved to take the cross from him, fearing that he might die in the street, whereby they would lose the full satisfaction of seeing him die on the cross between two thieves, like a criminal.⁵⁸

Thus Amico’s obsession with measures and numbers emerged from entrenched pilgrim practices, using measurement, commensuration, and meditative numeric repetition as devotional aids, both on-site and back home. In Amico’s treatise the application of new representational techniques and familiarity with the professional language of Renaissance architecture is used in a very traditional manner. Amico’s impulse to replicate Jerusalem relates to long-running pilgrim rituals, intended to bring the sacred back home. His

⁵⁴ Amico, 48 (34).

⁵⁵ Amico 1953, 1, 13. I would like to thank Dr. Wendy Pullan for generously sharing with me her work in progress on Amico, the models, and their place in the western representational tradition. Several late sixteenth-century models are extant.

⁵⁶ Daniel B. Rowland, “Moscow - The Third Rome or the New Israel?” *Russian Review* 55, no. 4 (1996): 591-614 at 609-12.

⁵⁷ See for example J. Greaves, *Pyramidographia: Or a Description of the Pyramids in Ægypt*, London 1646.

⁵⁸ Amico, 31 (27).

meticulous attention to numbers and proportion is generated by the well-established tradition of performative, mystical measurement. The new tools, then, reaffirm a live liturgical tradition. In this amalgam, the term “devout curiosity”, once thought of as an oxymoron, acquires a special meaning. Being curious is no longer a danger threatening the pious pilgrim. It is rather a pious ideal in itself. This is a reformulation of the mix of measurement and adoration that defined the tradition of pilgrimage since late antiquity.

Looked at from the perspective of Christian pilgrimage, the story of the quantification of European culture becomes a bit more twisted and complex than linear.⁵⁹ When we study the history of measurement as a set of practices to which many layers of meanings are attached, we can no longer accept that precise measurement and realistic representation suffice in themselves to explain the cultural shifts that define the transition to modernity.

The exciting and growing new scholarship on the subject in the history of science presents the act of measurement as part of a repertoire of scientific rituals. Measurement is studied as a performance, or gesture, as a discourse of validation, often in the context of travel and instrumentation.⁶⁰ What this paper suggests is that there is a prehistory of gestural, quantitative knowledge, which may be pre-instrumental, and yet crucial for a fuller understanding of number in science and society. The case of Christian pilgrimage surely provides only one path into this lesser known earlier history.

⁵⁹ On qualitative attitudes to number see more in K. Thomas, «Numeracy in Early Modern England. The Prothero Lecture», *Transactions of the Royal Historical Society (Fifth Series)*, 37 (1987): 103-32.

⁶⁰ For example, the essays in M.-N. Bourguet, C. Licoppe, and H. O. Sibum, eds., *Instruments, Travel and Science: Itineraries of Precision from the Seventeenth to the Twentieth Century*, London 2002.

N. M. Wise, ed., *The Values of Precision*, Princeton, N.J. 1995.

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