

Shaping the Empire:
***Agrimensores*, Emperors and the Creation
of the Roman Provincial Identities**

VOLUME 1

Thesis submitted for the degree of
Doctor of Philosophy
at the University of Leicester

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July 2016

Abstract

From the time of Augustus, the Roman *agrimensores* or land surveyors provided an important connection between those who administrated the Empire on the one hand, and the territories and peoples they controlled on the other. This work is an investigation into the surveyors' use of the cultural capital of Roman society to fashion their own identity as experts in the organisation and regulation of land, and their influence on the shape of discourse about Empire. The study focuses on four questions:

- 1) What was the nature of the relationship between the *agrimensores* or surveyors and the Roman provincial administration?
- 2) What was the nature of the relationship between the *agrimensores* and the people of the Empire whose lands they surveyed? An emphasis will be placed on the population of Italy and the Roman provinces away from the city of Rome itself.
- 3) How did the surveyors validate their activities as technical specialists, and under what circumstances did the *agrimensores* undertake surveying work? The thesis will focus on practical and theoretical practices implemented by surveyors in the field to structure the discourse between land-holders and administrators. The topics of boundary disputes and the issue of whether or not the *agrimensores* were involved in the collection of cartographic information will also be considered here.
- 4) How and to what extent did the activities of the surveyors influence the provincial populations' understanding of the Empire by shaping their experience of the imperial administration?

Dedication

This thesis is dedicated to the memory of:

HELEN MARIE MAAS (8 May 1926 – 14 May 2016):

Who has lived to see this work completed and defended, but not submitted.

JEAN RAMSEY MORRIS (28 May 1919 – 8 March 2013):

Who continuously supported me in everything I did, taking pride in my academic achievements.

RUSSELL EDWARDS MORRIS, JR. MD (5 December 1923 – 9 April 1979)

and

JEROME HENRY MAAS (20 January 1927 – 14 June 1988):

Who sadly did not live to see the beginning of my academic career.

Acknowledgements

The submission of this thesis represents the end of a very long and difficult journey. In the course of that journey I have accrued many debts to people, who have made such a huge difference in my life. I would like to take this opportunity to acknowledge those debts and thank all those who have supported me over the years. First and foremost, I need to thank Prof. Leon Fitts, Prof. Chris Francese and Prof. Mark Mastrangelo, who taught me all I know about Greek and Latin. More importantly, Leon took me to Italy all those years ago, when I was a freshman at Dickinson College, and convinced me to change my major from History to Classics. It was the start of this journey and the most momentous choice of my life. Chris was my supervisor and incredibly supportive, both at Dickinson and in the years after I graduated. I can only hope that one day I can be half as good a mentor and teacher to students as Leon, Chris and Mark were for me.

Next, I need to thank all those at Victoria University Wellington and the University of Leicester, who have mentored me and seen me through my graduate studies. First, I need to thank Prof. Art Pomeroy and Prof. Matthew Trundle, who not only supported me through my MA, but gave me my first publications and academic position as Research Assistant. At Leicester, I owe a special debt to Prof. Graham Shipley, both for inviting me to study and for mentoring, to Dr. Andy Merrills and Dr. Jeremy Taylor, my supervisors, for all their hard work and guidance, to Dr. Neil Christie for mentoring me on review-writing and so many other things, and to Prof. David Mattingly for letting me have access to his private collection of journals and insights.

I need also to thank Dr. Oriol Olesti Villa (Universitat Autònoma de Barcelona) for access to his Power Point slides of Oxford lecture notes (2014) and Dr. Alessandro Pace (Università degli Studi di Milano) for the use of his photography of the temple of *Aizanoi* (Turkey).

I also owe a special debt of thanks to Dr. Tom Elliott, who was my boss and mentor at the Ancient World Mapping Center where I acquired my interest in the Roman Land surveyors, to Prof. Richard Talbert, who kindly allowed me to sit in on so

many of his graduate courses in Roman History, to Prof. George Houston, who introduced me to the joys of Latin epigraphy and to Prof. Nic Terrenato, who spent much time discussing field surveying theory and methodology with me.

Now I need to thank the two long-suffering people, who have acted as my Specialist Mentors and Sighted Assistants during my PhD (University of Leicester) and MA (Victoria University Wellington): Dr. Antonino ‘Nino’ Crisà and Tania Hayes.

Thanks also goes to: Dr. Crysta Kaczmarek, Dr. Niccolò Mugnai, Gabi Witthaus, George Sfougaras, Julie Mahon, Em Halsey, Marion Sanson and so many other friends.

Last, and most importantly, I need to thank my parents Russell E. Morris and Geraldine M. Morris and my three guide dogs Annie, Vinnie and Ludo, who have all made the journey with me. Thank you so much for making this possible.

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List of abbreviations

AE	<i>L'Année Épigraphique</i> . Paris: Fondation Maison des de l'homme, 1888-.
BE	<i>Bulletin Épigraphique</i> . Paris: Les Belles Lettres, 1938-.
CIG	A. Boeckh, J. Franz, E. Curtius, A Kirchhoff and H. Roehl (eds.), <i>Corpus Inscriptionum Graecarum</i> . Berolini: Ex Officina Academica, vendit G. Reimeri Libraria, 1828-77.
CIL	T. Mommsen (et al.) (eds.), <i>Corpus Inscriptionum Latinarum</i> . Consilio et Auctoritate Academiae Litterarum Regiae Borussicae Editum. Berlin: Georg Reimer, 1863-1974.
EDH	<i>Epigraphic Database Heidelberg</i> ¹ .
FIRA	S. Riccobono and V. Arangio-Ruiz (eds.), <i>Fontes Iuris Romani Anteiusustiniani, in usum scholarum</i> (3 vols.). Florentii: Apud S. a. G. Barbera, 1940-68.
HEp.	<i>Hispania Epigraphica</i> ² .
Iapollonia	P. Cabanes and N. Ceka (eds.), <i>Corpus des inscriptions grecques d'Illyrie méridionale et d'Épire. Vol. 2. Inscriptions d'Apollonia d'Illyrie</i> (Études Épigraphiques, 2). Athens: École Française d'Athènes et Fondation D. et É. Botsaris, 1997.
ICret	M. Guarducci, <i>Inscriptiones Creticae. Opera et consilio Friderici Halbherr collectae</i> (4 vols.). Rome: Libreria dello Stato, 1935-50.
IEph	H. Engelmann, H. Wankel and R. Merkelbach (eds.), <i>Die Inschriften von Ephesos</i> (IGSK 11-17). Bonn: Rudolf Habelt, 1979-84.
IG	G. Kaibel (et al.) (eds.), <i>Inscriptiones Graecae</i> . Consilio et Auctoritate Academiae Litterarum Regiae Borussicae Editum. Berolini: Georg Reimer, 1892-1974.
IGBulg	G. Mihailov (ed.), <i>Inscriptiones Graecae in Bulgaria Repertae</i> (5 vols.). Sofia: In Aedibus Typographicis Academiae Litterarum Bulgaricae, 1958-1970.
IGRR	R. L. Cagnat, J. F. Toutain, V. Henry and G. L. Lafaye (eds.), <i>Inscriptiones Graecae ad Res Romanas Pertinentes</i> (4 vols.). Paris: E. Leroux, 1911-27.

¹ <http://edh-www.adw.uni-heidelberg.de/> (last access: December 2015).

² <http://eda-bea.es/> (last access: December 2015).

- ILAlg S. Gsell, X. Dupuis and H.-G. Pflaum (eds.), *Inscriptions Latines de l'Algérie*. Paris: H. Cahmpion, 1922-2003.
- ILJug A. Šašel and J. Šašel (eds.), *Inscriptiones Latinae quae in Iugoslavia inter annos MCMII et MCMXL repertae et editae sunt* (Situla, 25). Ljubljana: Narodni Muzej, 1986.
- ILLRP A. Degrassi (ed.), *Inscriptiones Latinae Liberae Rei Publicae* (2 vols.). Florentii: La Nuova Italia, 1957-63.
- ILS H. Dessau (ed.), *Inscriptiones Latinae Selectae* (3 vols.). Berolini: Weidmann, 1892-1916.
- ILT A. Merlin (ed.), *Inscriptions Latines de la Tunisie, par Académie des Inscriptions et Belles-lettres (France), Fondation Dourlans*. Paris: Presses Universitaires de France, 1944.
- IScM D. M. Pippidi (ed.), *Inscriptiones Daciae et Scythiae Minoris Antiquae* (5 vols.). Bucharest: Romanian Academy, 1983-2000.
- MAMA E. Herzfeld, S. Guyer (et alii) (eds.), *Monumenta Asiae Minoris Antiqua*. Manchester: Manchester University Press, 1928-.
- PIR E. Klebs, P. de Rohden and H. Dessau (eds.), *Prosopographia Imperii Romani*. Berolini: Apud Georg Reimer, 1897-98.
- RIB R. G. Collingwood, R. P. Wright and R. S. O. Tomlin (eds.), *The Roman Inscriptions of Britain* (3 vols.). Oxford: Clarendon Press, 1965-2009.
- SEG *Supplementum Epigraphicum Graecum*. Leiden: Brill, 1923-.
- TAM Österreichische Akademie der Wissenschaften, *Tituli Asiae Minoris*. Wien: Hoelder, Pichler, Tempsky, 1901-89.

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Preface

The origin of this project goes back more than a decade to when I was working in the Ancient World Mapping Center at the University of North Carolina at Chapel Hill on what was then called ‘The Blind Audio Atlas and Tactile Mapping System’ (BATS). While I was there, Tom Elliott, who was then the Director of the center, gave me a copy of Oswold Dilke’s book *The Roman Land Surveyors* (1971) to read, knowing that I was interested in doing a PhD in Ancient History at some point. Reading Dilke’s work started me thinking about surveying, geography and cartography in the Roman world. When the BATS Project came to an end in 2004, circumstances did not allow me to undertake a PhD at the time; thus, I went on to do other things. However, the Roman land surveyors stayed with me and my interest increased, after I discovered Brian Campbell’s *Writings of the Roman Land Surveyors*.

In 2007, a friend of mine, who knew that I was doing some work on Roman surveyors and the Roman army in my spare time, suggested that I put an abstract together for the Classical Association of England’s Annual Conference, which was scheduled to be held in Liverpool. I was apprehensive about it, since I did not even have my Master’s Degree at that point. However the abstract was accepted and I went to the conference, where several people were interested in what I had to say. The end result of that trip was that I ended up writing a Master’s thesis at Victoria University of Wellington on the social history and Latin vocabulary for surveyors and surveying in the Later Republic. At the end of that project, I was interested in moving on to look at the surveyors in the Principate with some idea of considering the role of surveyors in the development of ancient geography and cartography. Graham Shipley met me at another Classical Association Conference and invited me to come to Leicester to undertake my PhD.

This thesis is the final product of that offer. It is not the project I envisioned when I applied to Leicester. It is not even the project I intended to write at the end of my three years of research, since nearly a quarter of my material never got beyond the file of notes I took and another quarter ended up on the editor’s floor. Much of this material is reflected in the extensive bibliography at the end of this volume. While I

hope to go on to use this material in a future project, I decided to include it here as a reference tool for other scholars, who are interested in the *agrimensores*, Roman surveying and survey theory or ancient geography and cartography. Whatever projects might lie in the future, this one has been a truly stimulating challenge to research and write.

Introduction

But when aging Saturn held sway over the world,
the Earth hid all her wealth in deep darkness.
She stored bronze and silver, gold and heavy iron
among the shades; there were no ingots then.
Then she gave better things - crops without a curved ploughshare
and fruit and sweet honey found in the hollow oak-tree.
No one split the earth asunder with the strong plow's blade,
the surveyor did not mark out the land with a boundary, no one swept the
churning sea with a dipping oar;
the furthest mortal journey ended at the shore...³

Immediately every kind of wickedness erupted into this age of baser natures: truth, shame and honour vanished; in their place were fraud, deceit, and trickery, violence and pernicious desires. They set sails to the wind, though as yet the seamen had poor knowledge of their use, and the ships' keels that once were trees standing amongst high mountains, now leaped through uncharted waves. The land that was once common to all, as the light of the sun is, and the air, was marked out, to its furthest boundaries, by wary surveyors. Not only did they demand the crops and the food the rich soil owed them, but, they entered the bowels of the earth, and excavating brought up the wealth it had concealed in Stygian shade, wealth that incites men to crime. Now, harmful iron appeared and gold, more harmful than iron. War came, whose struggles employ both, waving clashing arms with bloodstained hands.⁴

0.1 Historical Context

For the poet Ovid, writing in the age of Augustus, surveying was an act that created order out of the violence of human chaos. He associated it with the establishment of *limites* for property, agriculture, and technology, borne of Man's fall from a state of grace in the Golden Age, when there was neither need for technology to overcome the natural world nor for artificial constraints on human conduct.

The Earth and the Gods took care of all mortal needs. Then came the fall and with it the moral depravity that caused all manner of suffering. The only way to stop the

³ Ovid. *Ars Am.* 3.8.35-44 (translation after that of A. S. Kline, <http://ovid.lib.virginia.edu/trans/Ovhome.htm>).

⁴ Ovid. *Met.* 1.128-143 (translation after that of A. S. Kline, <http://ovid.lib.virginia.edu/trans/Ovhome.htm>).

violence was for a single person to gather the reins of power into their hands and establish moral and physical boundaries.⁵ For Ovid and his contemporaries, Augustus was that individual. Yet, the task was not a straightforward one, since Augustus had to forge a new political consensus out of the remnants of the old Republican institutions to provide for the stability Ovid and his contemporaries expected. However, as he had to find a way to settle thousands of veterans discharged after the wars, he stabilised the traditional systems of land tenure, forming the very foundations of the Roman economy and creating a system for resolving interstate and local disputes.⁶ To accomplish this objective, Augustus adopted and drastically altered several of the institutions, which had developed in the period from the Second Punic War through to the Dictatorship of his adoptive father Julius Caesar.

Under the Republic, disputes over boundaries or land between private landholders were resolved either through informal arbitration or before a local court competent to try the matter.⁷ Interstate disputes were resolved using the system of arbitration, worked out in the period following the death of Alexander the Great, under the direction of a Roman consul or proconsul, who was appointed by the Senate for the task.⁸ Until Tiberius Gracchus established his land commission in 133 BC, every colony was established by a *lex* appointing *triumviri* or a board of three magistrates of praetorian or consular rank and individual allotments were assigned over a wider area by *decemviri* or boards of ten.⁹

There is little evidence to show who implemented the instructions of these boards, though Claude Nicolet has shown that each board had a body of *equites*, who served as *finitores* under their direction.¹⁰ The actual work of taking measurements and planting markers was probably left to veteran soldiers, who were used to doing such work while on campaign.¹¹ Beginning with the Gracchan land commissions, however, *deductores* began to be able to establish more than one colonial foundation and seem to

⁵ Ovid. *Met.* 1.128-143; *Fast.* 1.532; *Ep. Ex Pont.* 2.9.33, 4.13.27.

⁶ Campbell (2005), 321-322; Kehoe (2007), 5-10; Richardson (2008), 133-145; Lobur (2008), 7-12, 29-34; Mattingly (2011), 126-128.

⁷ Cic. *Tul.* 17; Cic. *De Leg. Agr.* 1.55; Cat. *De Agr.* 1.7; 6.3; Crawford (2002), 763-764.

⁸ Cic. *De Off.* 1.33; Sherk (1969), 78-85, no. 14; Chaniotis (2004), 186-192; Campbell (2005), 321-322.

⁹ Gargola (1995), 25-31, 52-63, 73-98, 103-113; Campbell (2000), 472-474; Braudhead (2007), 148-161.

¹⁰ Nicolet (1970), 100-103; Gargola (1995), 59-63; Hölkeskamp (2010), 98-107.

¹¹ Lucil. fr. 100; Polyb. *Hist.* 6.26.10; 6.27.1-3; 6.32.1-2; 6.41.1-2.

have started to employ Greek technical specialists from *Magna Graecia*, called *geometrai* to carry out the work of surveying.¹²

In the years following Sulla's dictatorship and the colonial program he introduced to punish the Italian communities who stood against him, surveying, and those who did it, became increasingly divisive and politicised as social changes began to be felt within Roman society.¹³ Clear signs of this can be seen in the political iconography that appeared on coinage in the period from Pompey's second consulship through to the battle of *Actium*, where Roman politicians used the image of the *groma* or surveyors' cross, and the *decempeda*, or surveyor's measuring rod as symbols to celebrate the foundation of colonies or the reorganisation of territorial land belonging to the Italian *municipia* (Fig. 0.1-02).¹⁴

More importantly, the coinage attests to what Andrew Wallace-Hadrill has termed a 'knowledge revolution'. That is, a social transformation in which the control of specialised knowledge and the power it granted shifted from a privileged group of Rome's elite citizens to a group of "professionals", upon whom political and military leaders could draw for control and the maintenance of Empire.¹⁵ This was a sociological transformation relating to who held power, and how this power was accessed, which enabled members of the Italian and provincial elite, as well as plebeians, freedmen and even slaves, to participate in the formation of *consensus* about who had power and what it meant to have it. Both Caesar and Octavian rose to prominence on this current of change in knowledge discourse, since both depended upon men such as the architect Vitruvius, the military supply-contractor P. Ventidius Bassus and the Spanish-born surveyor of Samnite stock L. Decidius Saxa. All were able to gain political influence at Rome through a literate education and their technical knowledge.¹⁶

Once Octavian secured his position as Augustus, however, he and his top advisers changed the discourse of consensus about the role of technicians in the Roman world to follow traditional Roman social norms. In the future, work undertaken by

¹² App. 4.2; Uguzzoni and Ghinati (1968), 126; Gargola (1995), 148-174; Mouritsen (2008), 471-483; Rich (2008), 543-572.

¹³ Santangelo (2006), 147-157; Bispam (2008), 447-456.

¹⁴ Crawford (1974), 412/1; 425/4c; Schioler (1994), 60, no. 22.

¹⁵ Wallace-Hadrill (2005), 57; (2008), 215, 260.

¹⁶ Cic. *Clu.* 161; Cic. *Phil.* 8.26; 11.12; 13.2; Caes. *BC.* 1.62; Sen. *Suas.* 7.3; Vit. *De Arch.* 1.Pr.2.

architects or surveyors would be overseen by members of the Roman equestrian and senatorial orders, whose ranks would neither include technicians nor would its members practice such crafts beyond a level necessary to achieve control.¹⁷ To help establish this social relationship between surveyors and the Roman political elite, Augustus, his wife Livia and supporters, such as Statilius Taurus, sponsored freeborn surveyors and invested in a number of slaves, who were trained as surveyors.¹⁸ They used these surveyors, along with technicians enlisted in the army to reorganise boundaries across the Empire, to resolve disputes and carry out engineering projects, which simultaneously built up infrastructure and provided information about the Roman world.¹⁹

As the three monumental funerary *cippi* of Titus Statilius Aper (Fig. 0.3), Lucius Aebutius Faustus (Fig. 0.4) and Nicostratus Popidius (Fig. 0.5) show, the surveyors themselves freely entered into this imperial consensus.²⁰ Each monument draws on the conservative language of traditional Roman funerary practice to honour family and patron and employs the same iconography of surveying instruments found on the late Republican coinage mentioned above. Indeed, Nicostratus Popidius depended upon the iconic power of the *groma* (Fig. 4.5) as a symbol of the surveyor's craft. In particular, he did not bother to identify himself as such in the simple inscription adorning the funerary stele he set up for himself and his concubine Popidia Ecdioche at some point in the half century following the battle of *Actium*.

The monument that most fully exemplifies most of the intellectual qualities and characteristics of the surveyors considered in this study, however, is that of Statilius Aper. According to the reports and photographs taken by Henry Stewart Jones, the *cinerarium* depicts Aper as a tunic-clad man in a *toga* holding a scroll. To Aper's left is a locked chest with a cylindrical stand for scrolls on top of it. On the left side in low relief are a foot-roll marked off in *digiti*, a surveyor's *decempeda* or surveying staff, a flat box with a sliding lid and a spool to hold Aper's surveying cord or chain.²¹ On the

¹⁷ Cuomo, (2007) 115-121; König (2007).

¹⁸ App. 1.23, 1.24, 1.25, 2.4.

¹⁹ App. 2.1, 2.2, 2.48.

²⁰ Zimmer (1982), 196-200; D'Ambrosio and De Caro (1983), 17b.

²¹ Dilke (1971), 49, 73; Lewis (2001), 19-22.

right side are a case of styli and an abacus.²² All the features surrounding Aper reflect the power of oratory, writing, mathematics and measurement.

0.2 Aims, Objectives and the Shape of the Work

This work is an investigation into the surveyors' use of the cultural capital of Roman society to fashion their own image and influence the shape of discourse about Empire. To narrow the focus of the investigation to a manageable size, four questions will be explored, as follows:

- 1) First, what was the nature of the relationship between the surveyors or *agrimensores* and the Roman provincial administration?
- 2) Second, what was the nature of the relationship between the *agrimensores* and the people of the Empire, whose lands they surveyed? Particular emphasis will be placed on the population of the Roman provinces and frontier regions, but because of the nature of the available evidence some discussion will also be devoted to the surveyors in Italy.
- 3) Third, how did the surveyors validate their activities as technical specialists, and under what circumstances did the *agrimensores* undertake surveying work? The focus of this discussion will be on practical and theoretical practices, implemented by surveyors in the field, in order to structure the relationships between individual land-holders or between land-holders and either local or imperial administrators. The discussion of this question will touch on topics that include boundary disputes and the problematic issue of whether or not the *agrimensores* were involved in the collection of cartographic information and the production of maps.
- 4) Fourth, how and to what extent did the activities of the surveyors influence the relationship between imperial administrators and the provincial populations by shaping their understanding and experience of Empire?

²² Jones (1912), pl. 15; Zimmer (1982), 198-200.

The study is structured around four thematic chapters that reflect main categories of inquiry, with each chapter broken down into a number of subsections, which have been set out in the table of contents. The first chapter explores the socio-cultural relationship that existed between the surveyor and the Roman provincial administrators, who were so frequently their immediate superiors and employers. It considers the circumstances under which a proconsul, legate or procurator might choose to employ a surveyor, and the reasons for that choice. It also investigates exactly where a proconsul, legate or procurator could locate a competent surveyor.

The Chapter Two looks at what a surveyor had to do in order to establish his identity and how he went about proving his qualities on the job. The emphasis here is on the practical and theoretical aspects of knowledge which an informed member of the public might expect a surveyor to demonstrate during the course of a survey, and the impact of those skills and procedures on the documentation of a survey to both the local and imperial level. It also considers how the surveyor could apply his knowledge base to influence human conduct and perceptions of the wider world over the long-term.

Chapter Three explores how surveyors were introduced to the provincial populations of the Empire and the impact that they had on the development of culture and civilisation in the provinces. The chapter focuses first on the nature of Roman boundaries and land ownership in order to establish exactly what it was that the Roman administration expected the surveyors to achieve in establishing boundaries. Then, it investigates points of contact between the Roman administration and provincial populations, in which the actions of the *agrimensores* would provide a positive incentive for the subject populations to adopt Roman surveying and surveyors for themselves. Finally, the chapter looks at how the provincial population both resisted the activities of Roman surveyors and used surveyors to resist the Roman administration.

Chapter Four reconsiders the role that surveyors played in the exploration and conquest of territory outside the direct control of Rome and their place within the Roman army. It pays particular attention to the tasks which the surveyors carried out while the Roman army was on campaign, and the impact of their activities on the imperial administration's own conception of the Empire. Some attention is also given to

the impact of the surveyors' activities on the non-Roman communities, which the legions encountered while on campaign, when the available evidence will allow it.

All four of these chapters are supported by five appendices, which are located in a separate volume. These appendices, whose organisation is set out in the introduction to that volume, contain the two hundred inscriptions and sixty-two images that form roughly half of the evidence considered in the discussion. For convenience, the footnotes refer to the inscriptions by their entry numbers in the second volume with notations, as follows: 'App. 1.10' refers to the tenth entry in Appendix One. The figures in Appendix Five will be referenced within the body of the text by the abbreviation '(Fig.)', followed by a chapter and item number used to organise the images. For example, '(Fig. 0.4)' cited above, refers to the fourth image associated with the introduction set out in Appendix Five, while '(Fig. 4.5)' refers to the fifth figure associated with Chapter Four in that appendix.

0.3 The Evidence and Scholarly Context for the *Corpus Agrimensorum*

The evidence for any study on the Roman surveyors is diverse and fragmentary. This is one of the main reasons that they have not featured in the mainstream of scholarship, particularly amongst Anglophone scholars. The collection of literary documents, known as the *Corpus Agrimensorum*, was first edited and published by Karl Lachmann in 1848.²³ However, Mommsen considered his monumental text to be very unsatisfactory and published a full account of the problems he had identified in 1895.²⁴ In the same year Max Weber published his influential and ground-breaking study of the Roman agrarian economy, drawing on the texts of the *Corpus Agrimensorum* for some of his most fundamental arguments.²⁵

To cope with many of the problems that Mommsen identified in the text of Lachmann, a fresh editorial venture was partially published by Carl Thulin at the start of the twentieth century.²⁶ This edition, which carried the text of just four of the authors listed in the *Corpus Agrimensorum*, namely Julius Frontinus, Siculus Flaccus, Agennius

²³ Lachmann (1848).

²⁴ Mommsen (1895).

²⁵ Weber (2008).

²⁶ Thulin (1913).

Urbicus and the various works attributed to Hyginus, remained the standard scholarly text for the works of the Roman land surveyors until very recently. In response to pressure from a number of French and German scholars, the European Commission began publishing fresh copies of individual authors from the *Corpus* with refined critical apparatus in the early 1990s. The most important of these publications for this study is that of the surveyor Balbus, edited by Jean-Yves Guillaumin.²⁷

Guillaumin, along with J. Brian Campbell, has also gone on to re-edit, translate and produce commentaries for the works of Frontinus, the anonymous work known as the *De Commentaria*, Siculus Flaccus and the works of Hyginus, which both editors have divided into Hyginus I and Hyginus II to distinguish between a number of stylistic and textual differences in the works under that author's name.²⁸ Campbell has also produced texts of works from the *Corpus* by Balbus, Agennius Urbicus and of a work known as the *Liber Coloniarum*. The text of Frontinus, Flaccus and the works attributed to Hyginus will be used for this study, as the textual tradition has been established on a fairly stable foundation by Campbell and Guillaumin. Balbus and Urbicus will also feature prominently in the discussion, particularly in Chapters Two and Four.

However, it needs to be admitted that the texts of these two authors are far from fully edited. Eric Bholin has recently suggested a number of emendations to the text of Balbus work on geometric surveying, based on his work on the writings of Euclid.²⁹ Likewise, Klaus Geus has suggested seven amendments to an important section of the text written by Urbicus.³⁰ Most of the suggestions seem to be worthy of adoption, but scholarly consensus about these suggestions has yet to be reached. I have attempted to take the suggestions of both Bholin and Geus into consideration when interpreting or translating both of these authors but there have been points where a clear choice did not seem possible. In such moments, I have deferred to the text of Campbell as the most recent and canonical edition of the *Corpus Agrimensorum* in the Anglophone community.

²⁷ Guillaumin (1996).

²⁸ Campbell (2000); Guillaumin (2005); (2010); (2014).

²⁹ Bholin (2013).

³⁰ Geus (2014a).

Only one other text from the *Corpus Agrimensorum* needs to be mentioned here, and that is the work on practical surveying techniques written by Junius Nipsus, which has recently been edited and translated by Jella Bouma.³¹ While Bouma's edition of this badly fragmented work is a great improvement on that of Lachmann, it is far from stable and could stand further study. However, extensive philological investigation of the sort which the text of Nipsus deserves is outside the scope of the research questions, set for this doctoral project and will not be undertaken here. The work is primarily used in this study because it, along with the writings of Balbus, constitute the only descriptions of surveying procedures carried out in the field that were described by practicing surveyors to survive from antiquity. This makes them invaluable for any discussion on practical surveying, regardless of the state of the text.

Beyond the core authors listed here, there are a number of other fragmentary works reported by Lachmann or Campbell. These texts, however, have not received the same level of scholarly attention and their editorial state makes it problematic to use them for analysis in the context of this project. A further complication in using any parts of the *Corpus Agrimensorum*, other than those discussed here, is the recent discovery of several new fragments of the *Corpus*. In 2011, Mario Petoletti discovered a small fragment of the *Corpus* in the Biblioteca di Petrarca, and in 2014, at a lecture given at Oxford University, Oriol Olesti-Vila announced the discovery of a new ninth-century manuscript, containing fragments of the *Corpus Agrimensorum* describing the geography of Roman Spain.³²

These new fragments will certainly change our understanding of the *Corpus Agrimensorum*, once their authorship has been determined and the text fitted into the present canon of writings. Within the context of the present study, however, only a select range of authors will be used. They include the writings of Frontinus, Balbus, Junius Nipsus, Siculus Flaccus, Agennius Urbicus and the writings attributed to Hyginus. These works have been chosen because, in addition to having some aspect of consensus about the text of each author, there is growing agreement that all of the works in this assemblage, with the possible exception of Agennius Urbicus, were produced in the period between 80 and 284 AD, with the majority written before the death of

³¹ Bouma (1994).

³² Petoletti (2011); http://oxrep.classics.ox.ac.uk/news/two_special_oxrep_seminars_on_roman_spain/.

Alexander Severus in 235 AD.³³ This is crucial since the works predominantly reflect the historiographical tradition of the High Empire, which is the main focus of this study.

0.4 Forms of Evidence outside the *Corpus Agrimensorum*

Other than the texts of the *Agrimensores* themselves, there are seven other sources of evidence that will be employed in the study: diagrammatic figures from the Medieval manuscripts of the *Corpus Agrimensorum*, Classical literature, inscriptions, papyri, coins, the bronze or marble cadastral maps, aerial photographs and the material evidence provided by archaeological field surveys or excavations.

The first of these types, the illustrations from the *Codex Arcerianus* produced in the sixth or seventh century AD, represent a particularly complex problem. Until very recently, they have been treated as an art-historical problem. In 1967, however, Oswald Dilke made an initial study of the illustrations, which demonstrated that many of the diagrams were integrated directly into the text in such a way as to generate a sustained discourse between written text and pictorial image.³⁴ Beginning with Reviel Netz's study of mathematical diagrams, scholars have taken an increased interest in the embedded dialectic relationship between texts and the illustrations or artistic monuments, which were created to accompany them.³⁵

In particular, Michael Squire has developed a detailed methodology for looking at the interplay between inscriptions and paintings from the Roman world.³⁶ But, as Steffen Bogen has observed, interpreting the technical illustrations in Medieval Greek and Latin manuscripts of ancient technical literature faces the double difficulty that one needs first to establish whether or not the illustration was originally intended to accompany the text and then establish the probability that the image was properly copied by the scribe.³⁷ A cautious analysis of any diagram should assume that it reflects not corruption but rather the reception of the text. This means that the illustration in the

³³ Bouma (1994), 15-18; Campbell (2000), Introduction XXIV-XLII; Guillaumin (2005), 65-68; (2010), VII-VIII; Roby (2014), 18-20.

³⁴ Campbell (2000), Introduction, XVII; Bogen (2013), 283.

³⁵ Dilke (1967), 9-29; Netz (1999), 19-65.

³⁶ Squire (2009), 189-196, 221-228, 241-298.

³⁷ Bogen (2013), 285-287.

manuscript reflects the scribes' understanding of the work, as much as or more than any attempt to copy something from antiquity. Some effort has been made to grapple with this problem in Chapter Two, where the illustrations found in the manuscripts of Balbus and Frontinus play an important role in the interpretation of the surveyors' production of *formae* or maps. Much of my interpretation has been anticipated by the work of Delphine Acolat and Courtney Roby.³⁸ I have also attempted to incorporate their ideas into my own interpretation of the documents as far as possible, though this is not an easy class of evidence with which to grapple.

Another source of evidence, which is far easier to interpret, even though it is still fraught with difficulties, is the vast body of Greek and Latin literature. These sources were largely written by the Roman political elite and reflected this group's understanding of the world. Many of these texts, however, particularly scientific works, such as those written by Aristotle, Euclid, Archimedes, Hero of Alexandria, Ptolemy and Galen, provide important context for the surveyors' world view. Above all, it was these authors, as much as works such as the writings of Ovid or Virgil, that formed the core of their education and preparation for work in the field.³⁹ In addition, several members of the Roman political elite, like Frontinus, Cicero, Varro and perhaps Apuleius were first-hand witnesses of Roman field surveys, thus as Serafina Cuomo has observed, they can provide a wealth of detail from the non-specialist's point of view.⁴⁰

Another body of evidence, which has already been mentioned and which will be at the core of this study, are inscriptions. These documents are what Greg Woolf, John Bodel and Werner Eck have discussed as the monumental writing specific to the Roman epigraphic culture.⁴¹ Within this sociological practice, people sought to enshrine their identity by monumentalising a text, which was bound to their personal identity through nomenclature. As will be seen later in this study, an inscribed name established identity and bounded an individual perpetually to a place or event, since any given event in the Roman annalistic historical tradition was bound to a moment in time and to the place where it happened.

³⁸ Acolat (2005); Roby (2014).

³⁹ Dilke (1971), 61-63; Guillaumin (1994), 286-294; Campbell (2000), 392; Roby (2014), 21, 38-39.

⁴⁰ Cuomo (2007), 105-106.

⁴¹ Woolf (1996), 25-28; Bodel (2001), 6-8; (2010), 111-112; Eck (2009), 78-79, 90-91.

Thus, each inscription was a monument which immortalised either the individual who created the text or the subject named in the text (and in many cases both). As monuments, inscriptions also mediated power relationships between groups and individuals, since, as Susan Alcock has observed, the creation of a monumental text tends to shape the collective memory about both events and objects.⁴² This is particularly true when the object is embedded in the landscape as a monument in its own right, as boundary-markers frequently were. This means that not only the identity of the author of an inscription, but also its location or presentation are crucial for interpretation and understanding.

Since many texts, particularly monumental archive walls containing inscribed letters from Roman officials, were frequently dismantled and carted off to other locations, clear interpretations about authorship and function can be hard to reconstruct. Even so, attention to location, authorship and structure will be observed whenever possible. Likewise, since the texts, which have survived in stone, metal and wood, tend to be badly damaged and amended by modern editors, an attempt has been made here to supply not only transcriptions of the key texts, but photographs or drawings wherever practical. While it has not been possible to totally avoid using reconstructions of the texts, an attempt has been made to minimise problems by using the best texts available, cross-referencing and noting damage to monuments. Inscriptions are the second richest source of information on the Roman land surveyors and surveying after the writings in the *Corpus Agrimensorum*. Tom Elliott and I have, between our respective works, assembled roughly two hundred and fifty inscriptions, illustrating the life and work of the Roman surveyors.⁴³

If inscriptions loom large in this study, papyrological documents and coins do not. Apart from the two coins cited above in this introduction, the only coins which contribute anything to the understanding of the Roman surveyors are a few issues of Trajan, depicting bridges discussed in Chapter Four. It would seem that after *Actium*, Augustus discouraged the celebration of colonial foundations or land allocations on imperial coinage and the trend took root as part of the social consensus forged at the start of the Principate.

⁴² Alcock (2001), 333-335; Kokkinia (2009), 192-193.

⁴³ Elliott (2004).

Papyrological documents also play a limited role here for two reasons. First, most of the documents come from Egypt, which historically has been treated as a separate and rather specialised province of the Roman Empire. Secondly, while many of the papyrological documents provide a great deal of detail on land-ownership in Egypt, almost none of them provide any information on Roman surveyors or surveying procedure. The few papyri used in this study come almost exclusively from Syria and illustrate either the role of surveyors in the Roman legions or else they are administrative documents, showing the relationship between the Roman administration and local land-owners involved in property disputes.⁴⁴

One class of evidence, which bridges the categories between the illustrations in the *Corpus Agrimensorum*, inscriptions and archaeology, is formed by the bronze and marble fragments of Roman survey plans. Two sets of bronze fragments, one from Arausio (Orange) and the other from Lacimurga (Extremadura, Navalvillar de Pela) have been found and fully published thus far by archaeologists.⁴⁵ Three further marble fragments are known from Italy, with one coming from Verona and the other two from Rome.⁴⁶ The bronze fragments date to the Flavian period, while the Verona tablet dates to the late Republic, and the fragments from Rome date to the Augustan period. The Verona, Arausio and Lacimurga tablets all show sections of land divided by lines into regular grid squares or centuries. In the case of the fragments from Verona and Arausio, the grid units are numbered and each has been assigned an owner, whose name and in some cases the status of their land has been inscribed on the tablet. The Lacimurga fragment has no names, but in spite of the reservations of Gerard Chouquer, it would seem to be a perfectly genuine example of a Roman cadastre.⁴⁷ The examples from Rome on the other hand represent a problem. They depict sections of aqueduct with depth measurements and in at least one case the marks of a grid with the names of owners abbreviated in each. The physical remains of these fragments, however, have been lost and the only surviving text is in the *Corpus Inscriptionum Latinarum* edited by Mommsen.⁴⁸ This makes it difficult to establish their authenticity.

⁴⁴ Fink (1971), 192-197; Feissel and Gasco (1995), 71-72; Ando (2000), 73-74.

⁴⁵ Piganiol (1962); Sáez Fernández (1990), 205-227; (1991), 437; Gorges (1993), 11-18; Chouquer and Favory (2001), 47-58; Arnaud (2003), 22-23; Leveau (2010), 59-62.

⁴⁶ Cavalieri Manasse (2000), 5-6; Rodriguez-Almeida (2002), 22-39.

⁴⁷ Chouquer and Favory (2001), 58.

⁴⁸ Gorges (1993); Guillaumin (2002); Christol (2006); Leveau (2010); Dubouloz (2012).

In what follows, discussion will focus primarily on the Arausio, Lacimurga and to a lesser extent the Verona tablets, because they are the best existing evidence and because studying landscape-formation and human settlement around the city of Rome introduces a number of very special problems, which cannot be addressed in this work. The fragments from Rome will only be referenced when they seem to illustrate a general point about land-holding or survey practice, which was applicable to both Rome and the provinces.

For most scholars, working with these documents involves either studying the abbreviated names and numbers on each document to place it into its proper sociological and historical context, or else trying to fit the fragments back into the landscape, in order to understand how the Romans organised space at a given location.⁴⁹ Both approaches have their merits, though the second approach rests upon the assumption that the Romans created their monumental *aes* or bronze cadastres with the idea of reproducing the landscape in a document, as modern cartographers might do in an inscribed map. However, while a relationship between elements of the landscape and features in the documents has been identified, other philosophical or sociological conventions seem to have been at work to influence the presentation of what should be a familiar landscape in unfamiliar ways.⁵⁰ To better interpret the documents as reflections of the ancient landscape and the Romans' understanding of it, scholars have turned to aerial photographs and the principles of landscape archaeology.

The existence of the bronze fragments from Arausio and the discovery of fences, stone walls and road systems, forming regular grids around Carthage and in northern Italy between 1833 and 1848, prompted scholars to identify and study what have become known as cadastral grids or the physical remains of Roman centuries or *pertica*.⁵¹ The search for these structures, which dominated studies of Roman surveying until recently, was greatly facilitated by the development of aerial photography between the two World Wars. These images allowed scholars to identify what seemed to be large sections of the landscape, subdivided into squares or rectangles by the remains of

⁴⁹ Chouquer and Favory (2001), 58.

⁵⁰ Dilke (1974b), 567-570; Guillaumin (1994), 289-292; (2002), 133-134.

⁵¹ Dilke (1971), 91-93; Bonnie (2009), 3-5.

ancient roads or walls that formed what the *Corpus Agrimensorum* termed *limites*, a word which can be translated as ‘roads’ or ‘boundaries’.⁵²

However, while the use of aerial photography can identify roads, ditches associated with Roman boundaries and military fortifications, it does not establish dating or the source of construction for such features.⁵³ In addition, aerial photography cannot identify features that have been eroded by modern building projects, industrialisation or agriculture, problems which have boosted scholars’ interest in the Arausio and Lacimurga tablets, since almost none of the *limites* they depict have survived in the landscape.⁵⁴ More importantly, aerial photography cannot show the complex interaction between *fines* or boundaries of any shape, which were not always marked by ditches or roads, and the *limites*, particularly when they were not marked by a road or ditch either, but only existed as points listed in a Roman survey document. The distinction between these two types of boundaries will become clearer in the course of the subsequent discussion.

To overcome the limits of aerial photography, archaeologists first turned to maps drawn up in the eighteenth and nineteenth centuries in the hopes of finding features, which have long since vanished. As Rick Bonnie, Helena Abreu de Carvalho and Florin Fodorean have all recently demonstrated, such maps can be very informative when combined with historical records of land-holding.⁵⁵ All three archaeologists have used evidence of this sort to explore the transformation of landscapes in the European provinces from the Roman period through to the sixteenth century. However, if a scholar in examining such maps and records attempts to establish boundaries and the structural identity of the ancient landscape without autopsy, there is the very real danger that a modern bias can be introduced into the results of any study.

The evidence of maps, records and aerial photographs can only be established through the rigorous autopsy of selected sites using field-walking, excavation and laboratory analysis of soil for botanical and chemical residues, taken from controlled core samples. A number of recent field projects, undertaken in France, Spain and

⁵² Dilke (1971), 134.

⁵³ Welfare and Swan (1995), 5-12; Bonnie (2009), 6, 33-36; Jones (2011).

⁵⁴ Bonnie (2009); Leveau (2010).

⁵⁵ Bonnie (2009), 44-45; Carvalho and Azevedo Mendes (2010), 157-160; Fodorean (2013), 62-68.

Northern Italy, illustrate both the value and importance of combining these various procedures through careful documentation of findings.⁵⁶ Two particularly strong examples of this practice are the project published by Philippe Leveau in 2012, who used wetland archaeology to reconstruct the course of the aqueduct and field systems outside of Arles, and the Wadi Faynan landscape survey recently synthesised by David Mattingly.⁵⁷ In both projects careful recording of features found in the field, maps, Global Positioning System data and environmental evidence, obtained through laboratory testing of strategically collected soil samples, allowed the archaeologists to reconstruct the development of a regional landscape. In what follows some of this data will be used along with aerial photographs of sites, where fieldwork has been done to illuminate the activities of the Roman surveyors out in the field.

A further source of archaeological data, which needs to be considered, is the evidence on the surveyors themselves. Excavations at both Pompeii (Italy) and Mainz (Germany) have unearthed what scholars have interpreted as a series of surveying instruments, which include the parts of a *groma* or surveyor's cross, foot rules, the ends of *decempeda* or surveying rods, writing implements and perhaps a portable sundial.⁵⁸ The standard reconstruction of these implements was presented by Matteo Della Corte in 1922 and it went unchallenged until Thorkild Schioler discovered that there were gaps and contradictions in the records documenting the finds Della Corte used for his presentation.⁵⁹

Drawing on the evidence of images on the coins and in the relief sculptures, discussed above as a guide to the tools, practices and identities of the surveyors, much as John R. Clarke did in his book on art in the daily lives of the Romans, Schioler suggested an alternative reconstruction for the *groma*.⁶⁰ This shattered the consensus about both the instruments and procedures that surveyors used in the field; both Michael Lewis and John Poulter have spent the last twenty years unravelling the literary,

⁵⁶ Carvalho and Azevedo Mendes (2010); Franceschelli and Trément (2010); Palet Martínez, Orengo Romeu and Riera Mora (2011); Ortega, Orengo and Palet Martínez (2012).

⁵⁷ Mattingly (2011), 176-187; Leveau (2012), 81-103.

⁵⁸ Dilke (1971), 75-76; Bonnie (2009), 6.

⁵⁹ Della Corte (1922), 28, 57; Adams (1984), 10-22; Schioler (1994), 45-52.

⁶⁰ Schioler (1994), 52; Clarke (2003), 118-129.

archaeological and epigraphic evidence for ancient surveying instruments and their use in the field.⁶¹

0.5 Chronological Limitations and Theoretical Considerations

There is an abundance of material for the study of Roman land surveyors from a variety of sources. Because of this diversity in source material, this project will employ a synthetic approach, which will integrate literary, epigraphic and archaeological evidence into a fuller picture of the surveyors' activities.⁶²

The chronological limits will be firmly set in the period from the rise of Augustus to the death of Alexander Severus. The starting point is justified in two ways. First, while the Romans did use surveying to define space under the Republic, and even seem to have thought about the control of territory in terms of 'inside' and 'outside' space, they did not associate the terms *imperium* or *provincia* with a territorial empire.⁶³ As a consequence, even when individual Roman officials, such as Lucius Roscius Fabatus (Fig. 0.2) or Julius Caesar, employed surveyors to structure the landscape of individual communities, they did so as individual patrons or at most as representatives of the Roman senate, operating on a limited scale. Prior to Augustus' principate, there was no centralised notion of Empire as an institution. The concept that Tim Whitmarsh and Clifford Ando have termed the universalising tendency, where all peoples of the Roman world were conceptualised as equals under the authority of an all-powerful *princeps*, only came to be through the social consensus, forged by Augustus during his long reign as emperor.⁶⁴ Thus, while surveyors undoubtedly had an impact upon those whose land they measured, they could not have played a role in the formation of a relationship between the provincial populations and a centralised imperial administration.

The end point for this study can be justified by the fact that, after the death of Alexander Severus, some rather dramatic social changes in Roman society began to take

⁶¹ Lewis (2001); (2012); Poulter (2009); (2014).

⁶² Compare similar approaches by Dilke (1971); Lewis (2001); Campbell (2005); Chouquer (2010).

⁶³ Riggsby (2006), 21-24; Richardson (2008), 144-145.

⁶⁴ Whitmarsh (2010), 5; Ando (2011a), 31-33, 40-45; Humfress (2013), 75, 78-79; Lavan (2013), 216-218, 221, 224-225.

place, as the Roman world worked its way through the violence of the third century crisis.⁶⁵ While there was doubtless continuity between the world of Severans and that of Constantine, there can be no doubt that substantial changes also took place. The investigation of the impact that those changes indisputably had upon the surveyors and their role in Roman society, would represent a study in its own right, just as considering the differences in the impact surveyors had on society under the Hellenistic kingdoms of Alexander's successors and the Roman Empire would.

The concept of the universalising tendency, whereby the imperial administration promulgated the image of a world order where all peoples were part of a hierarchy of graded equals under an emperor, raises the question of Romanisation, since the concept lends itself to a paradigm where the Romans exported their concept of culture out to the provinces.⁶⁶ To see the universalising tendency in this light, however, is to both misunderstand that tendency and to reintroduce a modern concept, which, as Greg Woolf, Simon James and David Mattingly have all argued, is unhelpful and overly simplistic.⁶⁷ The notion, much like the concept of the Romans' Burden introduced by Andrew Fear in 2011, places the emphasis of choice on the Romans, reflecting a state-oriented responsibility to change a less advanced civilisation, where most of the population is the same and all that differs is the degree to which individuals are willing to accept the benefactions of their imperial superiors.⁶⁸ While some members of the Roman elite may have felt that they had a mission to civilise the peoples of the world as Fear has remarked, it is doubtful that all saw things in this way or that there was any over-riding objective for the Empire's administrators to actively pursue any such course, since the hallmark of Roman administration was the process of petition and response.⁶⁹

As will be seen in Chapter One of the thesis, Roman administrators, who certainly considered themselves as superior to the provincial population, tended to wait for the provincial population to petition the Roman administrators for assistance before acting. When they did not, it was either because they saw an opportunity to gain the

⁶⁵ Elton (2006), 193-195, 204-205.

⁶⁶ Mattingly (2011), 23-24; Revell (2014), 381-382.

⁶⁷ Woolf (1998); James (2001); Mattingly (2011), 38-39; Revell (2014), 381-382.

⁶⁸ Mattingly (2011), 39-40; Fear (2011).

⁶⁹ Fear (2011), 24; Eich (2012), 89-92.

good will of a selective group or else because a given group initiated a challenge to the authority of the emperor and his representatives. The universalising tendency was a Roman means of placing people into identifiable social or legal categories to facilitate an unequal discourse of power, especially amongst those who were competing for the favour of the central administration.⁷⁰ This competition was constructed through and regulated by interaction between the peoples of the provinces, all of whom occupied various grades of inequality under the emperor and the imperial administrators. Each group within the Empire responded to the administration both in terms of their individual perception of the Romans and based on their own sense of cultural identity.

Recently, Andrew Wallace-Hadrill put forward the concept of code switching as a base for the formation of social identity.⁷¹ Within this system, an individual or group chooses cultural characteristics to project a specific identity, depending on the social context within which they find themselves and the message they wish to convey to others. As cognitive linguists and biological anthropologists have shown, the components comprising individual and collective choices in presentation, interaction and performance involved: language, dress, bearing and the encoded understanding of one's relationship to the environment.⁷²

Language, which includes mathematics, was a mechanism for encoding human experiences, like a computer code, where each language has its own expressions and requirements. The language one chooses and the way one chooses to use it determine social relationships, as does the way in which one moves. Specific occupations, as well as upbringing in peculiar locations, engender distinctive ways of movement. As will be seen, the surveyors used specific styles of movement and particular ways of speaking to engage with people from a variety of different social backgrounds and cultures about the organisation of land, using mathematics and a preconceived set of encoded categories.

The choices others made about how they interacted with those encoded categories, as well as their interaction with the landscape, shaped individual and

⁷⁰ Whitmarsh (2010), 5, 10-15; Ando (2011a), 33, 40-41; Eich (2012), 89-92.

⁷¹ Wallace-Hadrill (2008), 40-46.

⁷² Clarke (2009); Tilley (2012); Thiering (2014).

collective understandings of a place within the world and the manipulation of the identity of a place helped to shape social identity and relationships to the wider world. At the core of this discussion is the principle put forward by Gerard Chouquer in 2010, whereby land or indeed any physical body, is defined by the agency of human occupation and the establishment of identity for and control of use and the recognition of that use or ownership by others.⁷³ The Roman land surveyors were individuals who had an identity as experts of the regulation and organisation of such relationships through the deployment of specific skills. This work is a study of those skills and the discourse they shaped.

⁷³ Chouquer (2010), 89-92.

Chapter One: All the Proconsul's Men: The *Agrimensores* and Roman Provincial Administration

“Consider, Lord, whether or not you believe it necessary to send a surveyor here. For, it seems that quite a bit of money could be recovered from the superintendents of the public works, if only those works could be reliably surveyed. At any rate I am looking through the accounts of *Prusinum*, a matter that I am managing with the upmost diligence”.⁷⁴

1.1 Introduction

This letter, written by Pliny the Younger to the emperor Trajan, is perhaps one of the best-known documents connecting surveyors to the administration of the Roman provinces. It shows that Roman administrators linked knowledge based on quantifiable data to good government, and that surveyors were in many cases the key to obtaining that data.⁷⁵ More importantly still, it reveals that surveying was not simply important for the regulation of boundaries and the resolution of disputes, as many modern scholars have pointed out, but was crucial for assessing building projects and regulating public works.⁷⁶ But, even when scholars take the evidence of surveying in contexts other than boundary disputes into consideration, they rarely bother to consider the socio-cultural relationship that doubtless existed between the surveyor and his senatorial or equestrian superior.⁷⁷ This chapter will focus directly on that relationship. It will consider the circumstances under which a proconsul, legate or procurator might choose to employ a surveyor, and the reasons for that choice. It will also investigate exactly where a proconsul, legate or procurator could locate a competent surveyor. In doing so, the chapter will tackle head on the question of just how typical Pliny's letter to Trajan might have been. As a final point, the chapter will consider some of the tasks the surveyors carried out for the Roman civil administration in the provinces.

⁷⁴ Plin. *Ep.* 10.17b.2.

⁷⁵ Compare: Plin. *Ep.* 10.17.2-3, 37.2-3, 41.1-3, 10.61.3-4 with Front. *De Aqu. Urb.* 2, 9, 31, 65, 91.

⁷⁶ Dilke (1971); Campbell (1996); (2005); (2006); Chouquer (2007); Maganzani (2007); Dubouloz (2012).

⁷⁷ Cuomo (2007), 113-122; Grewe (2008), 329-333.

1.2 A Question of Knowledge: The Problem of Evidence

Understanding and assessing the relationship between the various senior administrators of the Roman provinces and the surveyors is complicated by two factors. First, the surveyors writing in the *Corpus Agrimensorum* rarely mention any source of imperial authority other than the emperor.⁷⁸ For the surveyors, it would seem that the Roman Empire comprised various communities of differing legal status and the figure of the emperor, under whom all communities were more or less equal. This worldview, termed “the universalising tendency” by some scholars, formed part of a larger dialogue about social identity in the Roman world and was not unique to the surveyors.⁷⁹ However, the surveyors’ use of the “universalising tendency” reflects direct engagement with imperial policy as it was made manifest through inscribed pronouncements and edicts.⁸⁰ This engagement, along with the surveyors’ activities in creating roads and boundaries, placed them at the centre of the conversation about the nature of the Roman Empire.⁸¹ This is something that will receive more attention elsewhere in this study.

The second part of the problem is that most of the epigraphic monuments recording surveying operations involving proconsuls, imperial legates or procurators do not bother to mention the surveyors or their role. This is because the vast majority of surveying monuments were set up by notable members of a community to celebrate and immortalise local achievements brought about by surveyors.⁸² Monuments not set up by local magistrates were usually commissioned by imperial magistrates or the emperor himself.⁸³ Neither the local elites nor members of the imperial administration, when commissioning such monuments, showed much interest in the lives, personalities and technical activities of the surveyors who made their success possible. Even when a monument does mention a surveyor for one reason or another, it is often difficult to properly interpret the relationships because the terminology used by the Romans

⁷⁸ Agen. Urb. *De Contr. Agr.* 2000.40.27-32; 2000.44.18-23.

⁷⁹ Ael. Arist. *Or.* 26.29-33; Tert. *Apo.* 30.3; Tert. *De Pall.* 2.7; Whitmarsh (2010), 5; Ando (2011a), 31-33; Humfress (2013), 75, 78-79.

⁸⁰ Lavan (2013), 216-218, 221, 224-225.

⁸¹ Ando (2011a), 40-45.

⁸² Cuomo (2007), 114-121; Eilers (2009), 303-305; Kokkinia (2009), 192-193.

⁸³ Elliott (2004), 11-22; Eck (2004), 6-11; (2009), 78-79, 81-83, 90-91.

themselves for surveyors and surveying operations was frequently inexact and changed over.⁸⁴

Fortunately, three sets of epigraphic documents have survived. They mention surveyors in a context where their identity can be partially established and their relationship to the Roman magistrates studied in context with the civic cultures of the Empire: a set of four letters in Greek and Latin inscribed into the wall of the *cella* of the Temple of Zeus at *Aizanoi* in *Asia Minor*; the record of a boundary dispute between the Thessalian communities of *Lamia* and *Hypata*; and a funerary *cippus* set up by the surveyor Nonius Datus in *Lambaesis* in Numidia to celebrate the completion of an aqueduct at the neighbouring city of *Saldae*.⁸⁵

The first and last of these documents are well published and have been studied several times over the last forty years. However, they have never been studied together and only rarely have they been examined for what they can tell us about the surveyors involved. Here we will consider all three monuments against a backdrop of evidence from a range of literary sources to explore the relationship between these technicians and the Roman emperor's most senior representatives.

1.3 A Question of History: Quietus and the Problem of Temple-Land at *Aezanoi*

In the year 126 AD, Avidius Quietus, the Roman proconsul of *Asia Minor*, intervened in a long-running property dispute involving several factions within the Hellenistic city of *Aizanoi*, modern Çavdarhisar (Fig. 1.1).⁸⁶ The record of his intervention, consisting of a series of letters in both Latin and Greek, was inscribed in an elaborate frame on one wall of the *cella* of the Temple of Zeus (Fig. 1.2).⁸⁷ These documents reveal how Quietus chose to deploy surveyors to resolve the conflict and preserve order in *Aizanoi*, as well as showing many of the complications faced by Roman administrators when

⁸⁴ Elliott (2004), 14-18; Conso (2006), 12-22; Hermon (2006), 183-190; Campbell (2006), 172-174; Lewis (2012), 131.

⁸⁵ App. 2.8, 3.34, 3.1; Mitchell and Levick (1988), XXX-XLIII; Kokkinia (2004), 50-56; Cuomo (2007), 116-120; (2011b), 145-152; Grewe (2008), 329-334.

⁸⁶ Mitchell and Levick (1988), XXXVI.

⁸⁷ App. 2.8; Laffi (1971), 10A; Mitchell and Levick (1988), XXXVI.A; Dignas (2002), 178-179.

trying to resolve property or boundary disputes within a community. Little is known about how the dispute at *Aizanoi* started. From the inscribed documents and a series of Roman boundary markers found around the temple, it would seem that a Hellenistic monarch named Attalus donated a large tract of land to the Temple of Zeus at some point in the mid to late third century BC.⁸⁸ At some later date, another Hellenistic monarch named Prusias took the land and divided it into allotments called *cleroi* for military veterans.⁸⁹

Since Zeus technically owned the land, it is likely that Prusias, in order to avoid a charge of impiety, had the veterans pay rent to the temple.⁹⁰ In the period from the end of the third century BC to the start of the second century AD, the practice of paying rent seems to have fallen into abeyance.⁹¹ Someone, perhaps the chief priest of the temple, either attempted to reinstate the rents at the start of Hadrian's reign, or else invented this story in order to levy rents from those living on the land around the temple.

The Latin letter from Hadrian to Quietus (Fig. 1.3) suggests that a delegation from *Aizanoi* petitioned Gaius Trebonius Proculus Medius Modestus, proconsul in 119 AD, to rule on the question of whether or not the *vectigal* or rent was owed by the landholders living around the temple.⁹² He apparently decided that the rent did indeed have to be paid, introducing a fresh set of problems since the exact boundaries of the individual properties could no longer be identified.⁹³ To avoid having the dispute degenerate into rioting and civil unrest, it is quite possible that Avidius Quietus intervened pre-emptively in 126 AD, as Christina Kokkinia suggests in her 2004 article.⁹⁴ However, while Roman administrators did interfere in municipal affairs from time to time, most administrative matters in the Empire were managed through the principles of petition and response.⁹⁵ As a consequence, governors tended to only act when asked to do so by a community or when the emperor ordered them to do so

⁸⁸ Kearsley (2001), 140-141, no. 166; Dignas (2002), 85, 178-179; Kokkinia (2004), 50; Cuomo (2007), 117.

⁸⁹ Mitchell and Levick (1988), XXXIII contra Dignas (2002), 86.

⁹⁰ Dignas (2002), 25-32.

⁹¹ Dignas (2002), 179; Elliott (2004), 189-190; Kokkinia (2004), 50-51.

⁹² App. 2.8; SIG 1898.386; Mitchell and Levick (1988), XXXVII.B; Oliver (1989), 170-173.

⁹³ App. 2.8; Mitchell and Levick (1988), XXXVII.B.

⁹⁴ Kokkinia (2004), 50-51; Elliott (2004), 59-60.

⁹⁵ Burton (2002), 114; Millar (2004b), 292-313; Kokkinia (2006), 184-188; Eich (2012), 89-91.

directly.⁹⁶ If a governor acted on his own initiative and his course of action proved unpopular with the provincial population, a community could appeal the matter to either the senate or emperor at Rome.⁹⁷ This was a course of action, which as will be seen in a later chapter, a number of well-organised communities followed when resisting the reorganisation of their lands by the provincial authorities.

Imperial conventions apart, the internal evidence from the letters between Quietus, Hesperus and Hadrian suggest that the entire affair was conducted by envoys representing the municipal government and the tenants of the land, rather than the Temple of Zeus and the landholders.⁹⁸ While the municipal government and landholders might seem the logical parties to enter into litigation based on the nature of civic politics in the Roman Empire, the matter is not so clear in this case since the rents being levied were due to the city, but the money primarily benefited the temple priesthood.⁹⁹ In addition, the letter of Quietus to the people of *Aizanoi* (Fig. 1.4) shows that the principal issue at stake was not the boundaries between individual property-owners, but rather how much each landholder should pay per allotment held, and the date from which rent should be calculated.¹⁰⁰ This was essentially a legal matter, which was outside the surveyors' competency.¹⁰¹ For, while the surveyors were concerned with the law, they were not jurists and only became involved in a court case when their craft was necessary for the application of the law to the resolution of a dispute.¹⁰² It is this distinction in the surveyor's role in administrative affairs which explains why Quietus only employed surveyors after he wrote to Hadrian and discovered that he was unable to implement the resolution, which, in his own account, Hadrian ordered him to apply.¹⁰³ This resolution entailed establishing a "Golden Mean" based on the average size of

⁹⁶ Eck (2004), 6-7, 9-10; Eich (2012), 90-91; Fuhrmann (2012), 148-151; Lavan (2013), 224-226.

⁹⁷ Burton (2002), 116-118; Campbell (2005), 320-321, 325-326; Fuhrmann (2012), 174-6; see also Chapter 4.

⁹⁸ Laffi (1971), 9-10, no. 10a-d; Mitchell and Levick (1988), XXXVI-XXXVII; Feissel and Gascou (1995), 71-74, 79-82; Dignas (2002), 178-186; Eck (2004), 12, 15-16; Cuomo (2007), 117; Eich (2012), 89.

⁹⁹ Laffi (1971), 51; Dignas (2002), 180-184; Kokkinia (2006), 183-184; Cuomo (2007), 117; Fuhrmann (2012), 175.

¹⁰⁰ App. 2.8.

¹⁰¹ Agen. Urb. *De Contr. Agr.* 2000.22.17-31; Hyg. *De Cond. Agr.* 2000.82.31-84.6 = 2010.2.25-27; Hyg. *Const. Lim.* 2000.160.22-162.1 = 2005.20.1-5; Campbell (2000), 360-361, no. 20, 474; Chouquer (2007), 19-20, 24-26; (2010), 110; Guillaumin (2005), 120, 212; (2010), 90-91.

¹⁰² App. 3.1; Agen. Urb. *De Contr. Agr.* 2000.20.25-32, 22.32-24.5, 38.34-40.4, 40.9-20; Ulp. *Dig.* 11.6.3.4; Rousset (2002), 91-94, 143-149; Elliott (2004), 121-130; Cuomo (2007), 112; Maganzani (2007), 2, 5-6, 12, 16; Vinci (2008), 11-12, 16-17.

¹⁰³ App. 2.8; Mitchell and Levick (1988), XXXVII, A and C.

allotments at other cities around *Aizanoi*, which could be used to fix the rate of payment artificially.¹⁰⁴

It is important to recognise that Quietus never states that Hadrian ordered him to employ surveyors and that neither Quietus nor the emperor Hadrian mentions them in their correspondence. The fact that surveyors were eventually called upon by the competent magistrate in the case shows that the nature of a court case could change and that surveyors often came on stage late in an affair to cope with a matter that was central to surveying, but tangential to a larger problem.¹⁰⁵ This was certainly true in the case of *Aizanoi*. But, before considering the specific circumstances behind why surveyors were required in this particular case, it is worth pausing to explore how a governor chose to employ surveyors and where a governor could turn to acquire them.

1.4 The Quandary of Quietus: Where to Find a Surveyor

The decision to call in surveyors ultimately rested with the competent magistrate on the spot. However, there were instances where the emperor could and did order provincial magistrates to seek out and employ surveyors to resolve a specific problem, such as the case of the proconsul Augurinus considered below.¹⁰⁶ But, even when the emperor issued an order for a provincial magistrate to employ surveyors, the final choice as to who and how to deploy them in a legal context, still remained with the acting imperial magistrate on site, and was based on a consensus of opinion from amongst his *concilium* or advisory council.¹⁰⁷ The *concilium* was principally composed of a magistrate's *amici* ('friends') and *clientes* ('clients'), most of whom were wealthy men who cannot have possessed much specialised legal or surveying knowledge.¹⁰⁸ Moreover, while members of the imperial elites who served in this capacity unquestionably maintained slaves and freedmen trained as surveyors, there is no evidence to show that they deployed their personal technical specialists in the service of the Empire.¹⁰⁹

¹⁰⁴ Mitchell and Levick (1988), XXXVII, C; Kokkinia (2004), 54-56; Cuomo (2007), 117-118.

¹⁰⁵ Maganzani (2007), 12, 16; Vinci (2008), 13-17.

¹⁰⁶ App. 3.1.

¹⁰⁷ Francese (2007), 111; Tuori (2010), 56-60.

¹⁰⁸ Jos. *AJ.* 18.4.6, 6.3; Plin. *Ep.* 1.9; 1.20; 1.22; 5.1; 6.15; Aul. Gel. *NA.* 14.2.9-10; Fron. *Ep.* 8.1.

¹⁰⁹ App. 1.25, 1.28, 1.43; Martin (1989), 64-66; DeLaine (2000), 124-126.

To judge from the available documents, most proconsuls, legates, and praetors preferred to draw their surveyors from the ranks of the serving legionaries or else from amongst the *evocati* or military reservists recalled to duty. This is most clearly demonstrated by the fact that the surveyors named in two of the three cases under consideration here were *evocati*.¹¹⁰ Yet, most of the provinces of the Empire, including *Asia Minor*, did not host a standing legion and the military forces assigned to serve their imperial administrators were usually composed of small detachments mainly drawn from the auxiliaries.¹¹¹ Since surveyors rarely served in the non-citizen auxiliary units in the period before the late second century AD, and the available number of *evocati* or enlisted legionaries were limited, it is likely that Quietus and other proconsuls had to seek their surveyors from elsewhere.¹¹²

One possible alternative source of surveyors to help governors such as Quietus may have been the emperor himself. In 1974 Focke Hinrichs advanced the argument that surveyors from the *Domus Augusti* or imperial household were assigned to the support staff of provincial administrators.¹¹³ Unfortunately, none of the inscriptions recording imperial slaves or freedmen who were surveyors show any clear associations or references to any element of the Roman imperial administration other than the emperor himself.¹¹⁴ Indeed, apart from a single letter of Pliny the Younger, there is just one inscription to conclusively show that the emperor ever assigned surveyors to assist a proconsul, legate or procurator, and in both of these cases the identity of the surveyor is not known.¹¹⁵ It might be argued that the limited number of inscriptions reflecting the emperor's deployment of surveyors in support of his provincial representatives simply reflects the nature of the epigraphic habit and a limited rate of survival. But, Trajan's reply to the letter of Pliny quoted at the opening of this chapter, makes it abundantly clear that he expected his provincial representatives to obtain whatever technical support they required without help from Rome.

¹¹⁰ App. 3.1, 3.34.

¹¹¹ Kokkinia (2004), 56-57; Fuhrmann (2012), 172-173, 182, 189-192.

¹¹² See Chapter 5.

¹¹³ Hinrichs (1974), 260-261.

¹¹⁴ App. 2.4, 2.7, 2.32, 2.33, 2.34, 2.37, 2.40, 2.41, 2.42, 2.43, 2.46; CIL 12.4490; AE 1942.43.0035 = 1983.0944.

¹¹⁵ App. 4.61; Plin. *Ep.* 10.18.

Furthermore, I barely have enough surveyors for the construction projects that are underway at Rome or in its vicinity. But, surveyors are to be found in every province, something which one may well depend upon, and for that reason, you will not be lacking for one if only you are willing to diligently undertake a search.¹¹⁶

In order for a governor such as Pliny or Quietus to follow up on Trajan's recommendation, it would have been necessary to first locate and then form a contract with a private surveyor as a *mentor a iudice adhibitus* ("surveyor employed as an advisor by a judge"), much as Tiberius Crassius Fermus, the private *arbitrator* in the dispute at *Herculaneum* discussed in Chapter Three, did.¹¹⁷ How difficult this may have been remains conjectural. If the *collegia mentorum* existed to provide a reference point for locating an independent surveyor or a wealthy patron willing to hire out his slave, then Trajan may well have been right in stating that it was simply a matter of looking. Otherwise, locating a suitable technician may have been a search for the proverbial 'needle in a haystack'. Regardless of the difficulty in hiring, the contractual nature of this arrangement obligated the governor to pay a *merces*, or fixed fee, to the surveyor; something that was probably not true for military surveyors or those attached to the *Domus Augusti*.¹¹⁸ Unless the governor wished to pay the *merces* out of his own pocket, it would have been necessary to make arrangements with the provincial procurator for official funds.¹¹⁹ This in part explains why Quietus states in his letter that he requested the procurator Hesperus to "choose" qualified surveyors:

Avidius Quietus, to the magistrates of the city of *Aizanoi*, the council and citizenry, greetings. The controversy concerning the sacred land, which was dedicated to Zeus long ago, which has been going on for many years, has been resolved thanks to the providence of the greatest emperor, because I wrote to him and explained the entire situation, asking him what must be done. There were two problems that particularly fuelled the dispute among you and represents what is both intractable and difficult to resolve. Having mixed justice with humanity, in accordance with the exactitude of his judgments, he solved our age-old dispute and mutual suspicion, as you will learn from the letter, which he sent to me. I have sent you a copy of the letter. I have also written a letter to Hesperus, the Augustan procurator, ordering him to choose qualified land surveyors, which he could use to

¹¹⁶ Plin. *Ep.* 10.18.3.

¹¹⁷ App. 3.1, 3.34; Ulp. *Dig.* 11.6.3.4; Arangio Ruiz and Pugliese Carratelli (1955), 453-454, no. 79; Camodeca (1994), 137-139, 146; Maganzani (2007), 2-3; Vinci (2008), 13-17; (2009), 268-269.

¹¹⁸ Paul. *Dig.* 10.1.4.1; Ulp. *Dig.* 11.6.1.1; Maganzani (2007), 4; Vinci (2009), 267-268; Du Plessis (2010), 99-100.

¹¹⁹ Burton (1993), 27-28; Eich (2005), 100, 125-128.

measure the territory and afterwards there should be only one size of allotment for you. And, as I have explained, I issue an order according to the sacred rescripts of Caesar, that the rent, which each person must pay for an individual allotment according to Modestus' decision, from which, as soon as you receive this letter, every person will pay in proportion to the amount of the sacred land which each possesses. In this way, certain individuals may not at some later date litigate about the rent and avoid the responsibility for the fact that the city benefits from all rent; in fact, it is enough for them to have benefitted until now. I have also sent the copy of the letter to Hesperus and a copy of another letter that Hesperus wrote to me. I wish you are well.¹²⁰

The language employed by Quietus here suggests that local technicians would be employed to survey the land at *Aizanoi* to establish a standard size of allotment for the purposes of fixing the rent. But, as the additional documentation Quietus shows (Figs. 1.5 and 1.6), the version of events Quietus communicated to the Greek speaking population of *Aizanoi* was rather different from what transpired. The differences between the Greek letter written to the people of *Aizanoi* and the Latin letters addressed to Hesperus and Hadrian prove Dio Cassius' statement that it was often hard to establish the true nature of events in the Roman world since any account of a situation always reflected the perceptions and interpretations of the author, as well as their choice of presentation.¹²¹ Like the distinctions that can be identified between the Greek and Latin letters, the Latin documents Quietus sent to Hadrian and Hesperus need not have contained all the same details in order to be true to the situation on the ground, and yet, the differences in presentation may have influenced the ways in which the emperor and procurator reacted. This relative presentation of truth was not just present in writing, but speech as well formed the essence of Roman rhetoric and it provided an impetus for Roman political leaders, administrators and as will be seen in the next chapter, surveyors as well to expend some considerable effort in mastering the strategies of rhetorical oratory.¹²²

Several fundamental differences between the highly rhetorical Greek account and that found in the official Latin administrative documents stand out and influence any attempt to understand the relationships that existed between the various Roman administrators and surveyors. First, the letter written by Hadrian to Quietus clearly

¹²⁰ App. 2.8; Laffi (1971), 10A; Mitchell and Levick (1988), XXXVI.A.

¹²¹ Cass. Dio 53.19.5; Eck (2004), 8, 11-13, 15; Ando (2012a), 221-222.

¹²² Quint. *Inst.* 1.9; 2.15; 2.17-18; 2.21; 8.1-3.

shows that while local units of land division were to be employed for establishing the “Golden Mean”, the final quantity was to be established not by surveying the land at *Aizanoi*, but, by calculating the average size of allotments at neighbouring cities. In addition, Hadrian did not develop this plan of action, as Quietus claims in his letter to the people of *Aizanoi*. His attribution of the plan achieved a crucial political objective: it formed the rhetorical strategy that embodied the universalising tendency and created the all-important illusion that Quietus and the people of *Aizanoi* were the subjects of the all-powerful Hadrian who as emperor could be counted on to resolve any and all problems. This illusion was crucial for maintaining Hadrian’s power as a ruler in the tradition of the Hellenistic monarchs of old amongst the cities of *Asia Minor*. Such universalising language was not needed in the administrative letters exchanged between the emperor and his deputies or between individual Roman magistrates.¹²³ In such documents, Hadrian could speak a different version of the truth, acknowledge his proconsul and give credit to Quietus as the person who developed the strategy for the resolution of matters at *Aizanoi*:

If the size of the subdivision, which they call allotments (*cleroi*), into which the territory dedicated by the kings to Jupiter *Aizanoi* has been divided, is not clear, the best solution, as you also judge, is to heed the measure, which is neither the largest nor the smallest of the allotments in the neighbouring communities.¹²⁴

The second discrepancy between the Latin documentation and the account of Quietus lies in who discovered that surveyors were needed to establish the “Golden Mean.” While Quietus takes credit for ordering Hesperus to choose surveyors in his Greek letter to create a sense of hierarchy amongst the representatives of Hadrian, the text of his letter to Hesperus does not mention surveyors or surveying. The proconsul’s instructions to Hesperus only require the procurator to find out the average size of allotments at other cities in the region.¹²⁵ It is the fragmentary letter forming the far right edge of the inscription (Fig. 1.6), which shows that it was Hesperus who realised that the information Quietus needed could only be provided by qualified specialists:

¹²³ Plin. *Ep.* 8.24.3-5.

¹²⁴ App. 2.8; Laffi (1971), 10B; Mitchell and Levick (1988), XXXVII.B.

¹²⁵ App. 2.8; Laffi (1971), 11C; Mitchell and Levick (1988), XXXVII.C.

Certain operations, oh Lord, cannot be otherwise brought to completion except by those men who are experts with experience of them. On account of this, since you had enjoined me to report to you what the measurement of the allotments in the region around the community of the *Aizanitiis*, I have sent in what material is at hand...¹²⁶

1.5 Digging in the Archives: Hesperus and the Registration of Provincial Property

Since there is no evidence to suggest that either Quietus or Hesperus ever spent any time in the vicinity of *Aizanoi* itself, the proconsul presumably expected his procurator to supply this information from the records used for tax collection stored in the provincial archives.¹²⁷ However, while Frontinus, Hyginus and Siculus Flaccus specifically state that lands delimited and allocated (in other words, surveyed) under the direction of the Roman authorities had maps and records detailing matters such as the size of allotments filed in the imperial archives, this was not necessarily the case for land attached to a community, which was organised using a local system of property demarcation.¹²⁸ Rather, available documentary evidence and regulations recorded in the *Digest* of Justinian show that the *forma censualis*, or census declaration, provided by local land-holders to their municipal magistrates, and which formed the bases of the procurator's tax rolls, only had to contain the name of the *fundus* or farmstead, the name of its owner, the names of the neighbouring *fundi*, the general use of the land, and either the total amount of land under cultivation or used for pasturage.¹²⁹

The size of individual allotments belonging to each *fundus* was not usually part of the information that land-holders were required to supply to their civic magistrates during the *census* process; though some private and municipal archives maintained such information for local use.¹³⁰ The mere fact that Quietus expected Hesperus to be able to access such information demonstrates the amount of control Roman magistrates

¹²⁶ App. 2.8; Laffi (1971), 11D; Mitchell and Levick (1988), XXXVII.D.

¹²⁷ Moatti (1993), 79-104; (2003), 31-42; Ando (2000), 83, 88-91, 95; Meyer (2004), 171-188.

¹²⁸ Front. *De Agr. Qual.* 2000.2.5-17 = 2005.1.2-3; Hyg. *De Lim.* 2000.76.1-78.4 = 2010.1.1-10; Hyg. *Cond. Agr.* 2000.82.31-84.13 = 2010.2.25-28; 2000.88.10-90.12 = 2010.2.48-56; Hyg. *Const. Lim.* 2000.154.17-33 = 2005.13.1-8; Sic. Flac. *De Div. et Ass.* 2000.120.20-30 = 2010.4.2-4.

¹²⁹ Pap. *Dig.* 10.1.11-12; Marc. *Dig.* 22.3.10; 33.1.12Pr, 50.15.4Pr; Tomlin (1996), 211-214; Capogrossi Colognesi (2002), 52-63, 204; Tarpin (2002), 193-196, 204-211; Chouquer (2007), 15-23; Maganzani (2007), 6-10.

¹³⁰ App. 1.19, 2.38, 4.64; Ando (2000), 91-93; Meyer (2004), 184-187; Liu (2008), 248-249; Kelly (2011), 3, nos. 8, 14 and 15, 128, nos. 12-14, 130, no. 26, 131, nos. 38-40, 133, no. 48.

believed they had or should have over the communities under their jurisdiction.¹³¹ Hesperus' inability to supply his superior with the required information, even though he enjoyed independent juridical and administrative competence in financial cases and in matters of provincial accounting, reflects a very real limitation of the Roman administrative system, which may have been overcome only in the fourth century.¹³²

On the other hand, the archival habits of the Roman administration, which scholars have frequently lauded, while imperfectly understood, could generate, copy, store, catalogue and authenticate most, if not all, of the documents and information generated by the Roman central administration.¹³³ That said, it is doubtful there was ever a single centralised archival bureaucracy or archival storage facility at Rome. Rather, the Roman archival service remained a decentralised repository of administrative information, with the various organs of the Roman government maintaining several individual storage facilities in a number of different places, such as the *Aerarium* and the imperial residence itself.¹³⁴ Each of the different archival centres, which were never permanently fixed within a building specifically constructed for the purpose, served a different constituency, much as each of the individual standing courts served a different juridical function.¹³⁵ In addition, it is likely that the majority of documentation produced by the administrators in each of the provinces remained in local archives, with summaries of data collections and only the most important documents being filed in one of the facilities at Rome. Thus, by way of illustration, the *tabularium Principis*, mentioned as a source of evidence in the inscription recording the dispute between the *Galillenses* and the *Patulcenses* on Corsica, was probably the emperor's personal archive, housing the records of his edicts, *decreta*, colonial foundations and the "Book of Benefactions", listing his gifts to various groups and individuals.¹³⁶ It would not have contained the documents recording the court case between these two provincial groups.

¹³¹ Compare: Kokkinia (2006), 184-188; Lavan (2013), 79-81, 90-91, 94, 100-101, 119, 156-157, 159-161.

¹³² Eich (2005), 105, 119-124, 137-139, 141-145; Souris and Haensch (2009), 359-361.

¹³³ Moatti (1993), 84-91; (2003), 30-33; Ando (2000), 81-87; Eck (2004); (2009).

¹³⁴ Culham (1989); Moatti (1993), 84-91; (2003), 37-40; Coarelli (2010); Neudecker (2013), 321-324.

¹³⁵ Moatti (2003), 37-40; Bablitz (2007), 48-51, 59-61; Neudecker (2013), 313-320.

¹³⁶ App. 3.1; Jun. Nips. *Flum. Var.* 75.89-95; Moatti (2003), 38-39; Elliott (2004), 98-100; Campbell (2005), 318, no. 42.

Since the Roman administration did not establish any permanent provincial archives outside Egypt in the period before the reign of Claudius, it is likely that most provincial documents remained in the hands of private individuals, in municipal archives or in the *commentaria* of provincial magistrates until the end of the Flavian period or later.¹³⁷ Even when provincial archives were introduced to the provinces, it was done in a decentralised and piecemeal manner, reflecting the Roman administration's response to what were considered inadequate local systems.¹³⁸ These archives or *tabularia* never replaced the existing municipal or district archives which already existed, but rather functioned much as the Roman court system did, providing an added umbrella of administrative record-keeping over the top of numerous existing repositories.¹³⁹

For the Roman administrators or those commissioned by them, the Roman *tabularia* were the primary repository for documents, but, the extent to which the provincial population utilised them depends upon two factors which cannot be quantified or qualified based on present evidence. First, the extent to which the provincial population utilised the Roman imperial archives was greatly dependent upon the extent to which they expected the Roman administration to recognise, safeguard and/or support them in local matters. On the other hand, there is the question of just how much the local population could access the Roman *tabularia provinciarum*. At the moment, a paucity of evidence makes it almost impossible to state to what extent the *Augustales* running provincial *tabularia* were willing to copy, authenticate or store documents created by the provincial population.¹⁴⁰ It is interesting to note, however, that while numerous inscriptions and papyrological documents show that provincial civic archives stored, promulgated and even monumentalised much of the documentation sent down by the imperial administration, the majority of the known administrative or juridical documents generated by the provincial population have been recovered from private archival contexts.¹⁴¹

¹³⁷ App. 3.1, 3.34, 4.12, 4.15, 4.17, 4.60; Plassart (1970), 43, no. 290, 48, no. 292; Richardson (1983), 33-35; Meyer (2004), 184-186.

¹³⁸ Ando (2000), 80-81; Moatti (2003), 37; Meyer (2004), 171, 176, 184-185.

¹³⁹ Brelaz (2008), 50, 56.

¹⁴⁰ For example, App. 4.64.

¹⁴¹ Compare: Ando (2000), 341-362; Meyer (2004), 126-127; Eck (2004), 6-12; (2009), 81-83, 90-93; Kokkinia (2009), 192-193; Kelly (2011), 127-143; Humfress (2013), 89-90.

If this reflects the provincial populations' actual archival practices, rather than a survival and recovery sample, then Werner Eck may be correct when he postulates that direct contact between the majority of the population of the Empire and the imperial administrative staff was quite limited and depended upon personal familiarity with the administrative systems of a province, rather than upon formalised networks for information sharing.¹⁴² A predilection for storing documents in private or municipal archives, as well as the absence of formalised networks for sharing information between different types of repositories and imperial administrators, would certainly explain the problems Hesperus had in obtaining the information Quietus requested. In addition, it explains why surveyors were required in so many situations in order to obtain information on property or property-ownership in the provinces.¹⁴³

Whatever future research into the imperial *tabularia* might reveal about their administration and relationships with municipal archives, the crucial point for our discussion here is the limited role they played in acquiring information on municipal activities not initiated by the central administration. While procurators such as Hesperus possessed independent juridical and administrative competence in financial cases and could write to local officials to demand information about land and land-ownership, procurators, contrary to the views of G. P. Burton, did not have any more direct access to imperial and municipal archives or to qualified surveyors than proconsuls.¹⁴⁴

When a procurator could not obtain such information and did not have direct access to the required specialists, in keeping with the division of responsibility structuring Roman provincial administration, it was entirely appropriate for someone like Hesperus to return the matter to the presiding magistrate in the case. Left to act without much direct support from the other elements of provincial administration, Quietus would have found it crucial to project an image of imperial solidarity amongst all the elements of the imperial administration in order to gain compliance from the local population.¹⁴⁵

¹⁴² Eck (2004), 12; (2009), 90-93; Kelly (2011), 3-4, 128-129, 134-137; Humfress (2013), 82-87.

¹⁴³ Hyg. *De Cond. Agr.* 2000.90.10-13 = 2010.2.56-57; Sic. Flac. *De Cond. Agr.* 2000.118.16-24 = 2010.2.61-62; 2000.132.7-15 = 2010.4.58-59; *De Div. et Ass.* 2000.120.20-30 = 2010.4.2-4; Maganzani (2007), 5-8.

¹⁴⁴ Burton (1993), 23; Eich (2005), 141-145; Souris and Haensch (2009), 359-361.

¹⁴⁵ Jos. *AJ.* 17.9.31; *BJ.* 2.2.16, 2.3.45, 2.5.66; Tac. *Agr.* 19.4; *Ann.* 4.15.2; Cass. Dio 57.23.4; Eich (2005), 109-116.

1.6 Words and Actions: A Choice in the Strategic Use of Surveyors

When considering the range of options open to Quietus in resolving the problems at *Aizanoi*, it is important to remember that every magistrate could deploy surveyors in two distinct ways. They could employ them as advisors or investigators, but they could also invoke surveyors as a rhetorical *topos* in public documents and speeches. As Werner Eck has argued, letters such as that written by Quietus were intended for public consumption.¹⁴⁶ They functioned as bridges of communication between the Roman administration and the local population that were intended to create an atmosphere of solidarity in the face of a particular problem when read aloud at public assemblies.¹⁴⁷ To accomplish this, the emperor and his magistrates drew on the principles of Hellenistic diplomacy and drafted their documents using the language associated with the universalising tendency as discussed above.¹⁴⁸ In the Greek-speaking regions of the Empire at least, invoking the surveyors in this context drew on the cultural capital of technical experts acting as impartial advisors in the resolution of inter-state boundary disputes to conjure the idea of an exact, quantifiable, rational, and above all, civilised solution to an otherwise intractable problem.¹⁴⁹

This meant that, for Quietus, referring to the surveyors in conjunction with all the municipal and imperial officials amounted to an authoritative declaration of imperial power, patronage and a promise of impartial justice. Commitments of this sort, which formed a component of imperial benefaction and patronage, played a key role in regulating relations between the Roman imperial government and the provincial population.¹⁵⁰ The texts from *Aizanoi* neatly illustrate the complicated conversations and rhetorical strategies involved in negotiating the implementation of such a political promise. To appreciate the practical contribution the surveyors made in regulating the relationships that were crucial to the final resolution of the situation at *Aizanoi*, it is worth leaving the province of *Asia* to look at two near contemporary cases in the

¹⁴⁶ Eck (2004), 11-12.

¹⁴⁷ Eck (2004), 12; (2009), 81-83; Ando (2012a), 221-223; Eich (2012), 88; Lavan (2013), 215-216.

¹⁴⁸ For discussion, see: Chaniotis (2004), 186-195; Wallace-Hadrill (2008), 213-258; Eich (2012), 87-90; Lavan (2013), 221-223.

¹⁴⁹ SEG 26.677, 27.226; IG 9.2.507, 14.645, line 187; Uguzzoni and Ghinati (1968), 126; Crawford (1971), 29-32; Bruno (1973), 107, doc. no. 98; Guillaumin (2005), 33-34; Cuomo (2007), 106-107, 112.

¹⁵⁰ Lavan (2013), 94, 157-173, 225-226.

provinces of Thessaly and *Mauretania Caesariensis*, where the interactions between the Roman magistrates, provincial population and surveyors are clearly visible.

1.7 Dividing the Thessalians or Marking a Greek Boundary

It is well established that inter-city boundary disputes were one of the major problems facing any Roman provincial magistrate.¹⁵¹ Yet, a stone found in the wall of a house at the Greek village of *Nyxiapes* in 1855 is the only instance where all the participants in such a dispute can clearly be seen together. The text on the stone reports a dispute between the Thessalian communities of *Lamia* and *Hypata* dating to some point between 124 and 132 AD.¹⁵² The text of the inscription reports the *decretum*, or final verdict, rendered in the case by the proconsul Quintus Gellius Sentius Augurinus:

The verdict was read aloud from the documents on the Kalends of March during the proconsulship of Quintus Gellius Sentius Augurinus: Since the best and greatest Princeps Trajan Hadrian Augustus wrote to me that once surveyors were consulted concerning the dispute over the boundaries between the *Lamienses* and the *Hypataei*, and the case investigated, I should make a boundary demarcation. And since I was frequently at hand, and on successive days, in the present affair, and I investigated it with the advocates of both cities present, through my consultation of Julius Victor, the surveyor, a veteran of Augustus recalled to service, it is agreed that the beginning of the boundary will be at the point where I have discovered (the statue of) Side is located, which is just below the enclosure consecrated to Neptune. From there, it maintains a straight line descending (the slopes) all the way to the Dercynnian spring, which is across the *Sperchion* River so that a straight line cuts through the *amphispora* of the *Lamienses* and the *Hypataei* to that afore-mentioned Dercynnian spring. Then it makes for the *Pelion* tomb along the slope of Sir[---] to the Eurytian monument, which is inside the boundary of the *Lamienses* [---].¹⁵³

The language of the *decretum* announced by Augurinus suggests that the two communities were involved in *revendicatio*, or a legal claim on ownership of land between two neighbours, rather than an *actio finium regundorum*, or an action for the regulation of boundaries.¹⁵⁴ The dispute involved a piece of land referred to in the text as *amphispora*, a term otherwise not attested in Greek or Latin and which may mean contested property.

¹⁵¹ Burton (2000), 195, 197, 214; (2002), 115; Elliott (2004), 14; Campbell (2005), 314-315.

¹⁵² App. 3.1; Elliott (2004), 121.

¹⁵³ App. 3.1.

¹⁵⁴ App. 3.1; Maganzani (2007), 2, 5-6.

If this interpretation is correct and the *amphispora* was delimited by some system of boundaries recognised under Roman law, then resolving the dispute should have meant simply examining local records and/or witnesses to establish who had the best claim to the land. However, as the text of the inscription shows, Julius Victor, the surveyor in this case, had to run a *rigor* through the *amphispora* using locally recognised *termini*, suggesting that the question under consideration was more than just one of ownership. It is quite possible that the *amphispora* was what the *agrimensores* called *ager arcifinius*, a sort of unbounded public land, the control of which was subject to a right of occupation.¹⁵⁵ At any rate, the description of the property under dispute and divided by Victor was probably open ground suitable for grazing. In addition to disputing pasturage on unbounded land, the case may also have involved a servitude or right of way for drawing water from either the river or the spring mentioned in the text.¹⁵⁶ This is indicated by the fact that the *rigor* drawn by Victor crossed the river, touched the spring mentioned and therefore may have blocked one of the cities' access to water from either the spring or riverbank without a right of way. Because the text is broken off at the bottom edge, however, the full extent of the case along with the identity of the final winner in the contest must remain the subject of conjecture.

In spite of this, a close reading of the text reveals several aspects of the surveyors' role in provincial administration. First, the system of petition and response as well as the proconsul's effort to create consensus through the universalising tendency present in the texts at *Aizanoi* are also on display in this case, though with some distinct differences. One crucial difference between the two cases is that the role of the emperor in resolving the situation between *Hypata* and *Lamia* is far less clear. At *Aizanoi*, Hadrian clearly exercised executive oversight and responded to a request for approval from Quietus. In the dispute between *Hypata* and *Lamia* there is the very real possibility that the two cities petitioned the emperor for a resolution to their dispute and that Hadrian instructed Augurinus to deal with the matter.¹⁵⁷ But, as Tom Elliott has pointed out, the inscription itself does not clearly state that Augurinus acted under orders from

¹⁵⁵ Front. *De Agr. Qual.* 2000.2.18-31 = 2005.1.4-5; *De Contr.* 2000.4.24-33 = 2005.2.5-6, 2000.8.12-17 = 2005.2.16; Aen. Urb. *De Contr. Agr.* 2000.28.16-36, 2000.30.14-21; Hyg. *De Cond. Agr.* 2000.82.10-22 = 2010.2.19-22; Sic. Flac. *De Cond. Agr.* 2000.104.15-21 = 2010.1.11; Hermon (2006), 187-190; Maganzani (2007), 5-7.

¹⁵⁶ Compare: Hyg. *De Cond. Agr.* 2000.78.21-32 = 2010.2.1-2; Robert (1928), 417-418; Fossey (1982), 50-52; Guillaumin (2010), 80-81, no. 3; Campbell (2000), 358, no. 5; (2009), 190-193; (2012), 98-100.

¹⁵⁷ Compare: App. 2.9, 3.1, 4.61.

Hadrian, but merely that Hadrian had written to advise him that surveyors should be consulted in resolving the dispute.¹⁵⁸ This suggests that Augurinus was asked to adjudicate the dispute and, like Quietus, requested imperial approval and permission to act.

Unlike Quietus however, Hadrian directly ordered Augurinus to seek out surveyors to help him resolve the matter. Such an instruction suggests that Hadrian considered the matter to be both politically significant and complicated. This assessment may have been prompted by the fact that other cities in the region, such as *Melitaia*, were known for using what has been referred to as judicial imperialism or the manipulation of Roman justice to gain control over the property of others.¹⁵⁹ Hadrian's concern for the maintenance, or at least the seeming maintenance of justice, between the two communities may also be reflected in the identity of the surveyor Augurinus employed, one Julius Victor, an *evocatus Augusti*. This description of Victor indicates that he was a soldier recently discharged from Hadrian's Praetorian Guard. This interpretation is prompted by a comparison of Victor's titulature with that of Nonius Datus, a *librator* ('levelling surveyor'), from the city of *Lambaesis* in *Numidia*. Datus is described as an *evocatus Legio III Augusta* on his funerary monument, showing that he was a soldier who served with the *Legio III Augusta* and was recalled to duty following discharge.¹⁶⁰

Victor's unit is not listed in the text of the *decretum*, an unusual absence that suggests his presence in the Praetorians, since such soldiers were close to the emperor, and would therefore not need to identify their unit in order to make their presence felt. Moreover, Hadrian visited Greece several times between 124 and 132, making the presence of discharged members of the Praetorians likely.¹⁶¹ Indeed, if Hadrian had a particular interest in either of the litigants here, then the contentious nature of inter-city politics may have prompted both the emperor and his proconsul to seek an influential surveyor from outside the territory to avoid the social and political pressure civic

¹⁵⁸ Elliott (2004), 121.

¹⁵⁹ Ager (1989), 109.

¹⁶⁰ Compare: App. 3.1, 3.34.

¹⁶¹ Birley (1997), 164-167, 176-184.

magnates could apply to local contractors.¹⁶² It is important to remember that a demarcation produced through fraud on the part of one of the parties in a dispute such as this could have precipitated violence.¹⁶³ In light of that prospect, a retired member of the Praetorians would be a logical choice for the assignment of establishing the boundary between *Lamia* and *Hypata*.

Since maintaining peace and order amongst the populations ruled by Rome was the principal concern for the imperial administration, one might expect that magistrates such as Augurinus and Quietus would have devoted lots of time to dealing with interstate disputes such as this. However, Augurinus, in the text of his *decretum*, states that he spent several days personally investigating the matter, as if it was a remarkable circumstance worthy of praise.¹⁶⁴ Furthermore, other documents suggest that by the end of the second century AD and perhaps earlier, proconsuls and legates were delegating as much of the work in boundary cases as possible to competent deputies, a circumstance reflecting the ever growing case-load that governors seem to have been expected to manage.

In keeping with this, it is significant that even when the senior magistrates were directly involved, most surveyors seem to have conducted their work without direct oversight from the responsible magistrate; a proceeding not entirely out of character with other aspects of Roman civil law.¹⁶⁵ Proconsuls principally attended the legal hearings and authenticated the boundary demarcations in accordance with Roman law and religious custom.¹⁶⁶ However, even the all-important job of authenticating newly-created boundaries was sometimes handed over to subordinates, who may or may not have been surveyors themselves.¹⁶⁷ In some instances those appointed as surrogates for the provincial governor were chosen by the communities whose problems they adjudicated, and in other cases the Roman authorities did not consider the feelings of the local population.

¹⁶² Agen. Urb. *De Contr. Agr.* 2000.46.20-48.3; AE 1939.0147; Ager (1989), 109-112; Vinci (2009), 261-270.

¹⁶³ App. 2.9; Apul. *Met.* 9.39; Jos. *AJ.* 20.2-4; Tac. *His.* 4.49-50.

¹⁶⁴ App. 3.1.

¹⁶⁵ Ulp. *Dig.* 11.6.1.2; Vinci (2008), 11-12, 15; Metzger (2010), 37-41.

¹⁶⁶ Compare: App. 1.36, 2.39, 3.1; Cic. *Tul.* 17, 21-23; Rousset (2002), 91-94, 143-149; Elliott (2004), 14-21, 122-130; Gargola (2004), 129-136; Behrends (2014), 12-20.

¹⁶⁷ Compare: App. 2.5, 2.39, 3.4, 3.5, 3.14, 3.1, 3.10, 3.11, 4.21; Elliott (2004), 92-93.

1.8 Consensus and Control: Augurinus, Victor and the Power of Arbitration

The Romans expected private citizens and civic bodies alike to submit disputes to third party arbitration, a system of dispute resolution born out of Hellenistic concepts of interstate diplomacy and modelled on the Praetor's tribunal at Rome.¹⁶⁸ The governor's court was not the only available venue for such activities however. Graham Burton's assertions notwithstanding, Roman magistrates did not have a monopoly on local or even inter-state arbitration.¹⁶⁹ More traditional systems of arbitration, while poorly attested in the epigraphic record, continued to function alongside the Roman courts well into the second century AD.¹⁷⁰ This meant that in adjudicating a boundary dispute, magistrates such as Quietus or Augurinus had to create an illusion of consensus, in which all in the Empire were more or less unified equals under a benevolent ruler who had the power to make his will felt anywhere and everywhere at once. This illusion, which was central to the Empire's ideological foundation, simultaneously camouflaged the limits of Roman power while drawing the local population into a complicit partnership facilitating the successful implementation of policies.¹⁷¹ At the same time, it was not enough for Quietus or Augurinus to simply invoke the universalising language that conjured up this illusion.

As an *iudex* or judge under Roman law, they had to rule in accordance with that law, which invested them with authority while implementing a practical resolution based on what Sextus Julius Frontinus referred to as "the truth of a place".¹⁷² While Frontinus conceptualises this "truth" in terms of centuriation, it is clear that creating a geometric grid in the landscape was only one component of this concept. In practice, this "truth" seems to have depended on two things: *consensus* or agreement between

¹⁶⁸ Chaniotis (2004), 187-195; Bablitz (2007), 59-60, 94-97, 116-120; Vinci (2008), 15-16; Metzger (2010), 27-29.

¹⁶⁹ Burton (2002), 117.

¹⁷⁰ App. 1.8, 4.31; Robert (1928), 417; Elliott (2004), 65-66; Brelaz (2008), 50, 56; Ando (2011a), 22, 28-29, 33; Humfress (2013), 82-91.

¹⁷¹ Ando (2000), 30-33, 134-135, 146-147, 155-156, 160-161; Lobur (2008), 13-14, 22-24, 29-36, 95-99, 107-112.

¹⁷² Front. *De Art. Mens.* 2000.12.3-15 = 2005.4.1; Agen. Urb. *De Contr. Agr.* 2000.44.3-4; Roby (2014), 27-28.

landholders or communities about how the boundary should be marked, and the actual creation of those boundaries to define the space.¹⁷³

While there was room for the law and jurists to influence the first of these components, the second depended entirely on the surveyor's art since it entailed laying out either *rigores*, straight paths between established markers, or else *flexus*, irregular lines that followed the landscape connecting up natural features such as trees, stones or streams.¹⁷⁴ It is important to recognise that, while not every dispute required a surveyor to create boundaries, every dispute depended on the "truth" generated by boundaries for their resolution.

The importance of *consensus* to the process of establishing "truth" and regulating the conduct of *Lamia* and *Hypata* is amply demonstrated in the text by the impersonal verb *placet*, which means "it is agreed" or "it is the general opinion that". This verb suggests the use of *concilium*, a term denoting both an advisory council and the process of making an informed decision based on all available information in order to establish a resolution to a problem.¹⁷⁵ This decision-making model was always slightly autocratic since it depended upon a person of superior standing drawing together the opinions of others under his *auctoritas*.¹⁷⁶ As proconsul and *iudex*, Augurinus possessed *superior auctoritas*, allowing him to place himself at the centre of the consensus building which leads up to the agreement concerning the boundary when he asserts, "I discovered" (*comperi*) the starting point of the boundary at the statue of Orion's sometime-wife Side, which is just below the sanctuary of Neptune.

While some members of the Roman elite, such as Sextus Julius Frontinus, who had first-hand experience of surveying projects in the provinces, urged Roman administrators to know something about the technical aspects of such operations to avoid being manipulated by their subordinates, there is no corroborative evidence to show that they were routinely involved with actual surveying to the extent Augurinus

¹⁷³ Agen. Urb. *De Contr. Agr.* 2000.24.32-26.6, 2000.30.1-4, 2000.32.2-7; Sic. Flac. *De Cond. Agr.* 2000.108.4-7 = 2010.2.9; 2000.108.19-23 = 2010.2.12; 2000.110.1-17 = 2010.2.15-18; Roby (2014), 27-28.

¹⁷⁴ Agenn. Urb. *De Cond. Agr.* 2000.40.19-20; Balb. *Ad Cels.* 2000.208.5-13.

¹⁷⁵ Plin. *Ep.* 5.1.5-6; Hor. *Od.* 3.4.65; Tac. *Hist.* 1.84.10.

¹⁷⁶ Ando (2000), 131; Francese (2007), 111, 115; Lobur (2008), 14, 35-36.

claims.¹⁷⁷ Most Roman senators and equestrians deeply interested in such matters may have perused available surveying texts in the same way that Aulus Gellius engaged with juridical literature in order to gain an understanding of the general aspects of the topic and become a more conversant member of the social elite.¹⁷⁸ If Augurinus and Quietus possessed such knowledge, it would have allowed them to interact with surveyors like Julius Victor without being subject to fraud, but it would not have provided Augurinus with the first-hand experience needed to mark out a boundary down the steep slope and across the river as described by the text since, as Frontinus himself attested, this was one of the most difficult surveying tasks one could undertake.¹⁷⁹

The description of the boundary itself, though fragmentary, represents a crucial part of understanding the role of surveyors in provincial administration, since it both reflects texts found in the *Corpus Agrimensorum* and shows how the surveyors applied theoretical knowledge in the service of both imperial magistrates and provincial elites. In the work entitled *De Conditionibus Agrorum*, the author describes a hypothetical civic boundary. The description of the boundary found in the *decretum* of Augurinus closely matches that of the universal formula for establishing a circular or asymmetrical boundary around a *civitas* found in the *Corpus Agrimensorum*.¹⁸⁰

A dispute about territorial jurisdiction occurs whenever there is litigation about possession of land because taxes have to be collected. One party claims that possession is established within the boundaries of its territory, while the other makes a similar claim in contradiction. This question should be settled by means of territorial boundary markers, for we (surveyors) often find in public documents territories distinctively designated as follows:

From the small hill called such and such, to such and such a river, and along that river to such and such a stream or such and such a road, and along that road to the lower slopes of such and such a mountain, a place that has the name such and such, and from there along the ridge of that mountain to the summit, and along the summit of the mountain along the watersheds to the place that is called such and such, and from there down to such and such a place, and from there to the cross-roads of such and such a place, and from

¹⁷⁷ Front. *De Aqu. Urb.* 2; Engelmann (1999), 146, no. 4; Cuomo (2000), 194-197; König (2007), 178-179, 185-186.

¹⁷⁸ Balb. *Ad Cels.* 2000.204.6-15; Howley (2013), 10-12.

¹⁷⁹ Front. *De Aqu. Urb.* 2, 9, 31-34, 128-130; Front. *De Art. Mens.* 2000.12.3-5 = 2005.4.1, 2000.12.16-2000.14.15 = 2005.4.2-4; Ulp. *Dig.* 11.6.1.1, 11.6.3pr, 11.6.3.4; König (2007), 188-189; Vinci (2009), 263-270.

¹⁸⁰ Hyg. *De Cond. Agr.* 2000.78.21-32 = 2010.2.1-2; Campbell (2000), 358, no. 5; Guillaumin (2010), 80-81.

there past the tomb of such and such to the place from which the description began.¹⁸¹

Based on the similarity between this description and that in the *decretum*, as well as the observations of Michel Tarpin, Federico Santangelo and M. Faudot, the delimitation between *Hypata* and *Lamia* should probably be understood as a common boundary between two *pagi*, or outlying civic districts.¹⁸² The Latin text of the inscription makes it likely that the nodes and *rigores* comprising both the boundary and its description were derived from collaborative discussions between Augurinus and Victor on behalf of the two *civitates* since Augurinus, represented by the first person singular, and the word for surveyor bracket the reference to the advocates for the two litigants.

The nature of this partnership is demonstrated by the fact that Augurinus uses the word *adhibitus*, which, as the text on the wooden tablet from *Herculaneum* discussed elsewhere has established, was a Latin technical expression used to indicate consultations between an *iudex* or judge and an expert advisor. Like Julius Victor, the surveyor Lucius Opsius Herma mentioned in this document, while *adhibitus* to the arbitrator Tiberius Crassus Fermus, investigated the boundaries between two adjacent *fundi* in the presence of the litigants and an impartial witness. These similarities suggest that there was a universal performative system of investigation employed by surveyors.¹⁸³ If the principles were indeed standardised, then they were likely similar to and perhaps derived from those developed in Greece, since the Hellenistic monarchs maintained professional surveyors long before the Romans.

In a recent article, Angelos Chaniotis has argued that Hellenistic states recognised the ownership of land based on four states of acquisition: inheritance, purchase, donation and conquest.¹⁸⁴ He further argues that establishing ownership under these four principles entailed determining the legal point of first occupation in accordance with the principles of law and proofs based on aural or documentary

¹⁸¹ Hyg. *De Cond. Agr.* 2000.78.21-32 = 2010.2.1-2, adapted from the translation of Campbell (2000).

¹⁸² Tarpin (2002), 199, 203-204; Santangelo (2006), 616-617, 623-626; Faudot (2006), 116-118; Chouquer (2007), 19-20.

¹⁸³ Compare: Ulp. *Dig.* 11.6.3.4; Cassiod. *Var.* 3.52.6-8; Agen. Urb. *De Contr. Agr.* 2000.46.1-48.3; Maganzani (2007), 3, 16; Vinci (2008), 14, 16-17.

¹⁸⁴ ICret. 3.4.9; Chaniotis (2004), 185-187, 191-192.

testimony, physical evidence from the land itself, and the philosophical principles of what was just.¹⁸⁵ While the Romans recognised many of the same principles, they preferred to establish ownership based on occupation starting from an agreed point in time, which could be established through surveyors' reports derived from sworn testimony, documents and physical evidence from the landscape, rather than from elaborate appeals to mythology or the remote past.¹⁸⁶ Such a normative process of assimilation doubtless depended upon social conventions and customs similar to those that will be discussed in the consideration of the *collegia mensorum* in the next chapter. These conventions, while not fixed through time and space by any law, nonetheless provided surveyors with definitive guidelines for the resolution of disputes, and placed the power of interpretation firmly in their hands:

But, we must watch out (for the practices of) different regions in case we seem to be doing something unusual. For, our profession will retain its integrity if we also conduct our investigations principally, according to the practice of the region.¹⁸⁷

It is important to remember that the boundaries and boundary markers found in the *decretum* of Augurinus closely correspond to the types of markers found in the pattern presented in the *Corpus Agrimensorum* and quoted above, since there is one oddity in the description of Augurinus, the statue of Side identified as the starting point of the boundary. Nor is this oddity an accident. While statues were frequently used as boundary markers in the Greek world before the advent of Roman rule, they never feature in the writings of the Roman land surveyors; indicating that they did not usually employ statuary alone in such a capacity. However, statues were used as rendezvous points for litigation on the day of a trial.¹⁸⁸ Moreover, courts were frequently held at sanctuaries and temples such as that of Neptune. Since Augurinus was the senior magistrate of the province and therefore obligated to hear other cases beyond that of *Lamia* and *Hypata*, it is likely that he chose the statue as a starting point for the survey as a matter of administrative convenience.¹⁸⁹ In addition, the choice also reflects the governor's need to exercise control over Victor. As writers such as Ovid and

¹⁸⁵ Chaniotis (2004), 198-206.

¹⁸⁶ Compare: Chaniotis (2004), 191-192; Cuomo (2007), 112-113; Vinci (2008), 11, 13, 16-17; (2009), 264, 271.

¹⁸⁷ Hyg. *De Gen. Contr.* 2000.94.25-27 = 2010.3.15, adapted from Campbell (2000).

¹⁸⁸ Neudecker (2010), 166-169.

¹⁸⁹ Metzger (2010), 40; Neudecker (2010), 161-163, 170-171; Fuhrmann (2012), 173-174.

Cassiodorus remark, surveying was a divine force with the power to transform the landscape and shape civilisation itself, making the surveyors a group of men who could transform the landscape like a force of nature.¹⁹⁰ Roman magistrates, who had a very real need to control and rule over others even as they themselves were dominated by the emperor, could not allow individuals such as Victor to exhibit an independent authority or exercise the final say in a matter and change things at will.¹⁹¹

To ensure the stability of Roman rule, surveying and surveyors, like the forces of nature itself, had to be at least symbolically subordinated to and controlled by Roman magistrates.¹⁹² As part of this oversight, Roman law specifically stipulated that if legal considerations, such as matters involving harvest or taxes or natural disasters like an earthquake, made the pure lines of a survey impractical or inadvisable, then the magistrate was fully entitled to ignore or otherwise alter the work of the surveyor when rendering a verdict.¹⁹³ Such powers of oversight could prove both a curse and a blessing since there is evidence that members of the provincial elites could take advantage of an unwitting magistrate during litigation just as easily as a clever surveyor could.¹⁹⁴ Nonetheless, the Roman elite were deeply concerned with regulating and controlling technicians and specialists. In his work on aqueducts, Frontinus makes several references to fraud and fraudulent practices perpetrated by technicians on unwitting administrators and the need for administrators to know what they are about in order to put a stop to it.¹⁹⁵ A similar concern about fraudulent conduct is doubtless also at the heart of all the regulations governing surveyors and their liability for fraud in the *Digest* of Justinian.¹⁹⁶

This exercise in subordination and control introduces two questions that neither the documents from *Aizanoi* nor the text of Augurinus' *decretum* address. First, since a Roman magistrate could disregard a surveyor's report, it is worth considering just how surveyors went about documenting their work to safeguard themselves from legal action by both suspicious magistrates and angry members of the provincial population alike.

¹⁹⁰ Ovid. *Met.* 1.135; *Ars Am.* 3.8.35-44; Cassiod. *Var.* 3.52.3-8.

¹⁹¹ Lavan (2013), 109, 112, 117, 119, 122, 139, 156.

¹⁹² Lavan (2013), 86-90.

¹⁹³ Ulp. *Dig.* 10.1.2.1; 10.1.8.1; Maganzani (2007), 11-12.

¹⁹⁴ Philos. *Vit. Apol.* 5.36; Fuhrmann (2012), 174, no. 12.

¹⁹⁵ König (2007), 188-190.

¹⁹⁶ Ulp. *Dig.* 11.6; Chapter 1 above.

Equally important would be the need to prepare themselves as advisors and/or witnesses in case of further litigation challenging the *decretum* of a Roman magistrate. Neither situation is clearly documented, but it would seem very imprudent to assume that neither eventuality could arise. Second, given the nature of the relationship between members of the Roman elite and the way they structured it in public documents, it is worth considering just how the surveyors constructed relations with their superiors in the course of public discourse.

1.9 Saving *Saldae*'s Water Project: Valerius Clemens, Nonius Datus and Aqueduct Levelling in Africa

While administrators such as Quietus and Augurinus employed land surveyors like Julius Victor to measure up boundary lines and agricultural plots, they also employed structural surveyors to investigate public monuments and levelling surveyors to measure off mineshafts and plan out the courses of aqueducts. A unique monument from the Roman colony of *Lambaesis*, set up by the surveyor Nonius Datus sometime after 154 AD (Fig. 1.7), records his account of how he saved the construction of an aqueduct at the colony of *Saldae* from disaster.¹⁹⁷ This hexagonal monument stood 1.7 m high, and was topped by at least three statues of women personifying the virtues of *Spes*, *Virtus* and *Patientia* listed at the top of the monument. The sides of the column contained the Latin text of Datus' narrative bracketed by at least two letters supplied as supporting documentation. The letters are written by two separate procurators of *Mauretania Caesariensis* to the legate of the *Legio III Augusta* at *Lambaesis* in the province of *Numidia*, requesting the assistance of Nonius Datus. The letters are unique and remarkable since they are the only extant evidence of what might be termed a "surveyor's archive", which shows both how surveyors recorded their activities when employed on a project and the ways in which they constructed their relationship with the imperial administration:

Varius Clemens to Valerius Etruscus ... the community of *Saldae* is most splendid and I and the population of *Saldae* ask that you encourage Nonius Datus the veteran leveller from the *Legio III Augusta* to come so that what remains of his work can be completed. ... From Porcius Vetustinus to

¹⁹⁷ App. 3.34; Janon (1973), 222; Grewe (1998), 133-140; (2008), 329-332; Cuomo (2011b), 143-146.

Crispinus, most generous Lord, you acted in all respects according to your humanity and friendly manner when you sent to me Nonius Datus, a soldier recalled to duty, so that I could manage matters with him on the works whose organisation he undertook. And although I was pressed for time and hurrying off to *Caesarea*, I nonetheless ran over to *Saldae* and found the aqueduct well begun, but, which, from the magnitude of the project I examined, could not be completed without the superintendence of Nonius Datus, who managed it both most diligently and accurately. Therefore, I would ask that you allow him to stay with us a few months for the direction of the project, even though he has developed an illness contracted from his labours (---).¹⁹⁸

Several key observations can be made from these two letters and the account situated between them on the *cippus*. First, the second letter shows that Datus had very little oversight from the procurators governing *Mauretania Caesariensis*, giving him almost total control over the project. More importantly, the project was a long-term collaborative enterprise to improve the municipal facilities of the city. The imperial procurator Petronius Celeris apparently facilitated the early stages of the project as a benefaction to the community.¹⁹⁹ To do this, he wrote to the Imperial Legate of the *Legio III Augusta* in Numidia to request the loan of a military surveyor around 137 AD.²⁰⁰ Since Petronius Celeris was an equestrian procurator, who was at best styled *prolegati* so that he could command troops upon occasion, his request for the loan of a surveyor from the *Legio III Augusta* constituted a petition for patronage since the legionary legate was a senator who held the rank of a proconsul even if he had not held the consulship.²⁰¹ The fact that the procurator had to subordinate himself by asking a favour from the legate to provide patronage for the people of *Saldae*, demonstrates just how complicated the web of social relationships forming Roman provincial administration really were.²⁰² In addition to demonstrating the complexities of provincial administration, the procurator's request also supports the supposition advanced above that Roman administrators preferred to obtain technicians from the legions whenever possible.

The Legate at *Lambaesis* seems to have respected Celeris' request, since Nonius Datus, a soldier on active duty with the legion, was detached for the task of conducting

¹⁹⁸ App. 3.34, lines 2-12 and 63-80.

¹⁹⁹ Niçois (2014), 10-11, 113-115, 239-242, 259-274.

²⁰⁰ PIR 3.27.204; Cuomo (2011b), 145, no. 14.

²⁰¹ Le Bohec (2005), 90; Briand-Ponsart and Hugoniot (2006), 74-75.

²⁰² Eich (2005), 109-116; Kokkinia (2006), 187-188; Fuhrmann (2012), 173-80; Lavan (2013), 157-158.

a survey at *Saldae* and made the first of what turned out to be three trips to the city. According to the testimony of Datus in his own narrative, it was during this first trip that he laid out the course of the aqueduct and drafted a *forma*, or drawn ground-plan of the watercourse. Since Datus states that he marked out the line of the aqueduct across the mountainside, presumably with stakes or levelling boards, as described recently by Michael Lewis, this document probably contained both written and illustrated directions intended to help the contractors during construction.²⁰³ Some support for this conjecture comes from the writings of Aulus Gellius and some surviving fragments of building plans.²⁰⁴ At the very least, his statement that he provided a *forma* to the procurator shows that Datus intended to document his activities and provide a record of what he accomplished during his time at *Saldae*.

Unfortunately, the text does not state how many copies of the *forma* existed or who held them. When delimiting land, surveyors customarily made two copies, with one being given to the Roman authorities and another left in the local community, and that is certainly possible in this case.²⁰⁵ What is important for our purposes here is that Datus supplied documentation of his work to the Roman authorities and that documentation either entered the procurator's records or the provincial archives, and perhaps both.²⁰⁶

The extent to which the availability of this information had an impact upon subsequent events at *Saldae* is an open question. However, Klaus Grewe has recently argued that construction on the aqueduct was delayed for about ten years or until 147, when another procurator, Porcius Vetustinus, had to write to the legate of the *Legio III Augusta* to request further assistance from Datus.²⁰⁷ The exact cause of this delay can only be guessed at, but it is likely that there were more than just technical problems in getting construction started. Epigraphic evidence from Numidia suggests that other similar projects were finished in about five years and archaeological remains from outside the ruins of *Saldae* show that while monumental, the *Saldae* aqueduct stretching

²⁰³ Lewis (2012), 152.

²⁰⁴ Aul. Gel. *NA.* 19.10.22-4; Vitruv. *De Arch.* 1.2; DeLaine (2000), 123; Rodriguez-Almeida (2002), 25, 35; Campbell (2012), 89-96, 116; Chapters 3 and 4 below.

²⁰⁵ Hyg. *De Gen. Contr.* 2000.96.5-37 = 2010.3.23; Hyg. *Const. Lim.* 2000.158.22-34 = 2005.16.1-17.4; Sic. Flac. *De Cond. Agr.* 2000.104.29-33 = 2010.2.2; Sic. Flac. *De Div. et Ass.* 2000.120.22-32 = 2010.3.2-4.

²⁰⁶ App. 3.1, 3.34, 4.11, 4.15, 4.17, 4.29; Sic. Flac. *De Div. et Ass.* 2000.120.29-32 = 2010.4.4.

²⁰⁷ PIR 3.89.647; Cuomo (2011b), 147, nos. 15-17.

21 km in length from end to end was by no means the most complex engineering project of its type.²⁰⁸

While military problems in *Mauretania Tingitana* in the 140s may have contributed to the delay, it is likely that local monetary and political considerations beyond the purview of surveyors such as Datus caused the majority of the problems at *Saldae*.²⁰⁹ Whatever the exact cause, the delay doubtless made it difficult to interpret the markers Datus had set up to guide construction when the contractors eventually started. Evidence from the letters quoted above suggests that this situation prompted the government of *Saldae* to petition the procurator Vetustinus for further assistance from Datus. Since Datus had been discharged at some point between 140 and 145, Vetustinus had to get the legionary legate to recall the surveyor to duty.

When Datus, who was doubtless in his early fifties, fell ill, the Roman authorities discharged him a second time even though the aqueduct was not finished. Such a discharge meant that Datus was no longer liable for further service, and when he was requested to return and help finish the job some years later, Datus, confronted with an unwelcome duty, declined to do the job. Without direct backing from the emperor in Rome, only the united social pressure of the legionary legate, procurator and people of *Saldae* proved sufficient to convince Datus to make the 130 mile journey from *Lambaesis* to *Saldae*.

Since most studies of the *Saldae* aqueduct tend to focus on the construction project as a direct act of imperialism initiated by the central administration, few have recognised the all-important proactive role of the *decuriones* of *Saldae* in the drama narrated by Nonius Datus.²¹⁰ This is understandable since Datus was a military surveyor and his narrative, if taken at face-value, states that the aqueduct tunnel was finished by two units of the Roman army: the *Gaesates*, or troops drawn from federated tribes in the Alps, and *classici milites*, or soldiers from the fleet.²¹¹ However, while troops could be used to carry out work on aqueducts, there is a very strong possibility that the aqueduct

²⁰⁸ App. 1.36; Janon (1973), 241-242; Le Bohec (2005), 68-69; Grewe (2008), 329-332; Cuomo (2011b), 150-151; Lewis (2001), 343-344; (2012), 153-155.

²⁰⁹ Briand-Ponsart and Hugoniot (2006), 69, 75; Fuhrmann (2012), 174-176.

²¹⁰ Cuomo (2011b), 155.

²¹¹ App. 3.34.

at *Saldae*, like so many other projects throughout the Roman world, was a local initiative, making the presence of these troops less substantial than some might believe.²¹² First, it is worth remembering that the Roman provincial administration operated on the reactionary principle of petition and response. Secondly, *Mauretania Caesariensis* was a province where the Roman administration maintained a minimal military presence.²¹³ All the available legionaries and the majority of the *auxiliaries* were massed in the neighbouring province of Numidia under the direct command of an administratively independent legate, who was, to the great annoyance of the governor of *Africa Proconsularis* and other magistrates, only answerable to the emperor at Rome.²¹⁴ In provinces such as *Asia*, *Mauretania Caesariensis* and *Mauretania Tingitana*, to conserve their limited military resources, which were composed of auxiliary units, administrators tended to be very sparing about tasking soldiers to assist in long-term projects that were not directly related to tax-collection or provincial security.²¹⁵ This remained true even when Roman law directly encouraged provincial magistrates to take an active hand in the upkeep of municipal buildings such as market halls and aqueducts.²¹⁶

Setting aside the logistical and administrative considerations, there is also the fact that most municipal building projects, including those with some measure of imperial support, were initiated and managed by private individuals or municipal magistrates as acts of euergetism, with most of the labour drawn from the local community.²¹⁷ This suggests that most of the work on the *Saldae* aqueduct was done by private diggers working under the direction of Datus, with the *Gaesates* and *Classici* only taking over at the final stages of the project to avert disaster. Even then, Datus states that he had to train them in order to achieve the desired result, making Datus the key man for success in the venture.²¹⁸

²¹² ILS 1367; TAM 5.2.868, 5.2.991; SEG 35.1483, 35.1522; AE 1985.0684.

²¹³ Le Bohec (2005), 90-91; Briand-Ponsart and Hugoniot (2006), 74-76.

²¹⁴ Briand-Ponsart and Hugoniot (2006), 54-55, 57, 62, 75-77.

²¹⁵ App. 3.46, 3.48; PDur. no. 89; Plin. *Ep.* 10.47, 77-78; Le Bohec (2005), 90; Briand-Ponsart and Hugoniot (2006), 75; Fuhrmann (2012), 190-192, 207-214.

²¹⁶ Ulp. *Dig.* 1.16.7.1; 1.18.7; Mac. *De re mil.* 49.16.12.2.1.

²¹⁷ Compare: App. 1.9, 1.39; TAM 5.2.868, 991; Plin. *Ep.* 10.17A-B, 58-61, 81-82; Niçois (2014), 259-274.

²¹⁸ App. 3.34.

Whether Datus directed soldiers or teams of diggers, he was placed in charge of the project by virtue of the fact that he was invested with authority as an expert by both the Roman procurator and the local community. The *decreta* from both *Herculaneum* and *Hypata* have already shown that relations between surveyors and the local population could prove important in any given survey. There is nothing in those texts, however, to suggest the local population of a community, or at least their leaders, actively participated in the selection of a surveyor when petitioning the Roman administration. Yet, the first letter quoted above shows that the people at *Saldae* actively supported Datus' return and may have even demanded it from the procurator. An inscription, found in Kosijerevo and published in 1964, shows that powerful landowners and civic magnates contracted with military surveyors for the regulation of boundaries and the restoration of private or municipal amenities such as bridges.²¹⁹ The same inscription also shows that there were situations where some of these contracts had to be regulated or facilitated by provincial magistrates. Regardless of the provincial authorities' involvement, military surveyors had to compete for these contracts, just as their civilian counterparts did.²²⁰ As a consequence, Datus, particularly during the period leading up to his first appointment to the project at *Saldae*, would have faced competition from other levelling surveyors in the *Legio III Augusta* and perhaps even from *Lambaesis*; though Serafina Cuomo has possibly overstated their presence at that community.²²¹ Success in obtaining and maintaining contracts, whether with private citizens or with civic councils, would have depended on an individual's standing within the community of surveyors, with the Roman magistrates themselves and with the provincial population.

As the passages quoted from Hyginus above show that a surveyor's standing depended on their ability to assess the landscape both on a legal and practical basis and on their *fides* or integrity.²²² Some of the methods surveyors used to assert or establish their collective *fides* as the preeminent authority on the interpretation of maps, boundary markers and all practical matters pertaining to the organisation or ownership of land will

²¹⁹ App. 1.1, 1.2, 1.7, 1.8, 1.9, 1.11, 1.16; Sergejevski (1964), 93.

²²⁰ Compare: Sergejevski (1964), 94-95 with Maganzani (2007), 3; Vinci (2009), 261-263, 267-270; Du Plessis (2012), 15-19, 99-101.

²²¹ Cuomo (2011b), 152, no. 82; *contra* Campbell (2000), introduction, XLVIII.

²²² Campbell (1996), 74-75; Meyer (2004), 150-151; Moatti (2006), 117, 119; Cuomo (2007), 112-113; Vinci (2009), 271-273; Lavan (2013), 185-187, 193.

be considered in the next chapter.²²³ In situations where surveying conventions and the law might come into conflict, however, the surveyors insisted on the right to dispute the matter with the jurists from the Roman political elite; only conceding their position when an issue turned exclusively on a point of law alone.²²⁴ Such assertions and the need to maintain the perceived integrity of the surveying tradition as an independent body of experts shaped the ways in which the surveyors represented administrators on their monuments and in their writings.

1.10 A Projection of Authority: Creating the Image of a Magistrate

Generally speaking, all magistrates, local or imperial, judicial or administrative, were treated with courtesy. However, in their own writings surveyors show themselves as asserting their authority to a far greater extent than senior Roman magistrates allow. Whereas magistrates such as Augurinus depict surveyors such as Julius Victor as deferential subordinates in their documents, surveyors tend to present themselves as dynamic experts whose knowledge and opinion is decisive and indispensable in resolving technical problems.²²⁵ The clearest example of this dynamic presentation is found on the monument of Datus when he describes his arrival at *Saldae* by saying:

I came to *Saldae*, met with Clemens the procurator, and he conducted me to the hill-side where they were lamenting the tunnel from the poor quality of work as if it had to be given up for lost...²²⁶

Here Datus constructs his meeting with the procurator Clemens as an interview between two equals, rather than as a professional consultation between an equestrian magistrate and a retired legionary. This construction of Datus' final consultation in his efforts to salvage the crisis at *Saldae* is therefore intended to raise the social standing of Datus as a surveyor and soldier to an exalted height. As such it is the most extreme example of a surveyor asserting what they and doubtless others saw as a central role in the administration of a Roman province, however, it is by no means the only example. Most of the authors in the *Corpus Agrimensorum* assert the importance of the

²²³ Moatti (2006), 119; Vinci (2009), 271-273; Chapter 3 below.

²²⁴ Agen. Urb. *De Contr. Agr.* 2000.20.25-22.3; 2000.32.8-24; 2000.36.3-4; 2000.36.10-15.

²²⁵ Compare: App. 1.7, 3.1, 3.34; Camodeca (1994), 138.

²²⁶ App. 3.34, lines 14-22.

surveyors' skill and their central place in Roman society to one degree or another.²²⁷ Some of the authors even boast that their skills were the real source of Roman political and military success, earning them significant privileges from the emperor.²²⁸

The authors in the *Corpus Agrimensorum*, however, never present themselves as interacting with members of the Roman political elite on a more personal or individual level as Datus does. Indeed, as Werner Eck has pointed out, the monument of Datus is almost totally unique, making it hard to contextualise.²²⁹ Even though the *Corpus Agrimensorum* is a patchwork of documents, each work within it represents a single type of document created by an individual author. The *cippus* by contrast is a composite of several document types, is fragmentary, and has been removed from its original site.²³⁰ Still, a comparison of Datus' monument with others created by surveyors indicates that it was intended to be a triumphal part of a tomb.²³¹ As such, only those who knew of Datus' reputation as a surveyor or who were directly related to him would have sought out the monument.²³² This means that the text on the *cippus* of Datus was not a published document in the way that the documents in the *Corpus Agrimensorum* were, allowing Datus to voice aspects of the surveyors' reality which could not be presented in their formal writings. Many people in the Roman world used letters and narrative on funerary monuments to justify their position in life and to establish an immortal reputation with posterity.²³³ Based on this, I, like Klaus Grewe, contend that Datus used a series of official documents he possessed and the Hellenistic principles of argumentation outlined above to assert his social position by organising the text of his tomb to closely reflect the structure of a courtroom proceeding.²³⁴

This interpretation further suggests that the administration engaged surveyors using written documents and that surveyors preserved those documents in archives for their own use alongside literature and demonstrations of surveying skill to assert their

²²⁷ Hyg. *De Cond. Agr.* 2000.88.10-21 = 2010.2.48-49; Sic. Flac. *De Cond. Agr.* 2000.102.3-5 = 2010.1.1; Agen. Urb. *De Contr. Agr.* 2000.46.19-48.3; Cuomo (2007), 112-113; Vinci (2009), 271-273; Roby (2014), 12, 14-15.

²²⁸ Balb. *Ad Cels.* 2000.204.1-32.

²²⁹ Eck (2009), 94.

²³⁰ Cuomo (2011b), 158.

²³¹ Compare: App. 1.2, 1.6, 1.17, 1.22, 1.32, 3.34; Zimmer (1982), 196-200; D'Ambrosio and De Caro (1983), 17b; Malay and Gul (1983), 283.

²³² Compare: Jaeger (2008), 38-45; Carroll (2011), 24-26, 31-34; Borg (2011), 53-61.

²³³ Eck (2009), 92-93.

²³⁴ Grewe (1998), 137-138, 326-328; Chanotis (2004), 186-187.

social position and defend themselves against legal challenges. In addition, it provides added support for the concept, discussed elsewhere, that surveyors maintained specialised libraries and archives to facilitate both training and technical support in the resolution of disputes.²³⁵ More importantly, the use and manipulation of documents, many of which were not principally intended for public circulation, also reflects the reciprocal and symbiotic system of patronage regulating the relationship between surveyors and magistrates. Magistrates needed the surveyors to help them resolve technical problems, but the surveyors were dependent on recognition from local or imperial magistrates to gain or maintain their standing, particularly when operating away from their home communities.

Broadly speaking, the relationship between the surveyors and magistrates was analogous to the reciprocal relationship that existed between a province such as Egypt and the Roman administration. Rome depended heavily on Egyptian grain to feed the people of Rome and the people of Egypt were well aware of this and boasted about it. By the same token, however, Egypt could not always survive without assistance from Rome, and the Roman elite fully expected the people to recognise that the emperor was the fountainhead of all benefactions.²³⁶ In a similar vein, surveyors could proclaim their own importance, particularly to one another, and, in private at least, Roman administrators might even agree with them, however, in a public context, surveyors were expected to be deferential.

As Myles Lavan has argued, the Roman political elite viewed the world in terms of rulers and ruled, for men like Quietus, Augurinus and Clemens, men like Datus were part of the ruled.²³⁷ By contrast, when the *Corpus Agrimensorum* and the cases presented here are considered together, one can perceive that the Roman surveyors operated with a different worldview. For surveyors the world was broken down into the emperor, magistrates, the surveyors themselves, and everyone else.²³⁸ In many cases the second and third categories could be conflated as the surveyors aligned themselves with

²³⁵ Balb. *Ad Cels.* 2000.204.30-32; Stuart Jones (1912), pl. 15; Martinez and Finn Senseney (2013), 405-407; Chapter 1 and 3.

²³⁶ Plin. *Pan.* 30-31.

²³⁷ Lavan (2013), 167-172.

²³⁸ Balb. *Ad Cels.* 2000.204.1-32; Sic. Flac. *De Cond. Agr.* 2000.102.3-9 = 2010.1.1, 2000.104.29-32 = 2010.2.2; Agen. Urb. *De Contr. Agr.* 2000.38.22-31; 2000.46.20-48.3; Cuomo (2007), 112-113; Maganzani (2007), 16; Vinci (2008), 10-11, 13-14, 16.

members of the political establishment for the purposes of exerting influence to resolve a problem or gain a personal advantage against their fellows. This outlook on Empire would have been natural and advantageous for the surveyors themselves, but it was not always compatible with the views of the Roman provincial administration. As a consequence there were doubtless times when the interests of the surveyors clashed with those of the imperial administration precipitating the need for direct intervention by the emperor. As we will now see, the situation at *Aizanoi* may have been one such case.

1.11 *Aezanoi* and All the Proconsul's Men

While the final resolution to the problems at *Aizanoi* will receive more attention when local resistance to Roman surveying is considered in Chapter Three, it is worth looking at some aspects of that resolution here since it demonstrates three important points. First, it shows the point at which an emperor was willing to supersede the provincial governor and become directly involved in a local matter. This is a question that has already been highlighted in the dispute between *Hypata* and *Lamia*, where the extent of Hadrian's involvement remains unclear. Secondly, the resolution to the situation at *Aizanoi* shows the limits of a governor's ability to resolve a problem, and the very real possibility that his actions, even when buttressed by surveyors, other provincial magistrates and the emperor proved insufficient to satisfy the demands of the provincial population. Most importantly, the outcome shows the limits of modern scholarly knowledge in reconstructing a specific case involving the surveyors.

It is worth recalling that Quietus, in his letter to the people of *Aizanoi*, promised that the surveyors he had ordered the procurator to choose would establish a single size of allotment so that he could fix the rents for the land claimed by the Temple of Zeus. The surveyors' highly competitive efforts at self-promotion and their indelible presence in the culture of the Greek population meant that this promise had to be more than a rhetorical gesture. Thus, the surveyors were unquestionably engaged and operated without direct oversight from the proconsul as so many surveyors did. The difficulty is in knowing exactly what they did to resolve the situation.

As has been noted, the original plan endorsed by Hadrian was to establish the average size of allotments in region around *Aizanoi* and use that as a basis for fixing the rents at *Aizanoi*. Since the information needed to carry out this plan was not available through the procurator's archives, two courses of action were available to Quietus. One was to assign the surveyors to establish the average size of allotments at cities in the vicinity and use that as a gauge to set the rate of payment. The other option would have been to undertake a survey of the lands at *Aizanoi* to establish an average size of allotment based on evidence gathered from whatever property markers existed on the ground. As text within the *Corpus Agrimensorum* show, surveyors were familiar with the investigation of cases involving the obliteration of markers or *rigores*. To resolve such cases, they advocated an active investigation of the landscape in order to re-establish the accepted structure of land-holding based on the pattern of markers from neighbouring properties or communities whose boundaries were not in dispute.²³⁹ In the rare event that no property markers remained or that a pattern could not be identified, the surveyors could introduce a new grid system for fixing rents by marking it out on a plan of the area and thereby producing a theoretical demarcation, or else by marking fresh *rigores* directly on to the ground.²⁴⁰

Many scholars, including Tom Elliott and Serafina Cuomo, believe that Quietus chose the first of these two options in part because Hadrian eventually had to intervene directly and in part because archaeologists investigating the area around the Temple of Zeus have not recovered much evidence for either a Hellenistic or a Roman demarcation.²⁴¹ However, it is worth recognising that the absence of evidence cannot be taken as proof of anything. Not all Roman field systems were marked on the ground and many that were marked out employed large wooden survey stakes as markers, which would leave little trace for modern investigators to find.²⁴² More importantly, as several French studies have recently shown, even when there are physical remains of Roman centuriation or boundary systems preserved in the landscape, interpreting the evidence

²³⁹ Hyg. *De Gen. Contr.* 2000.96.11-15 = 2010.3.20; Agen. Urb. *De Contr. Agr.* 2000.26.35-28.7.

²⁴⁰ App. 4.54 ; Troussel (1978), 158; Peterson (2006), 153-154.

²⁴¹ Kearsley (2001), 140-141; Dignas (2002), 86; Elliott (2004), 188; Cuomo (2007), 118.

²⁴² Hyg. *De Lim.* 2000.76.26 = 2010.1.7; Hyg. *Const. Lim.* 2000.138.5-8 = 2005.2.3; 2000.150.32-35 = 2005.11.6; Sic. *De Cond. Agr.* 2000.104.34-38 = 2010.2.3; Camodeca (1994), 143, 145; Vinci (2008), 13-15.

can be incredibly difficult.²⁴³ This means that it is quite possible that the surveyors employed by Quietus undertook investigations both at *Aizanoi* and at other communities in the area.

Hadrian's intervention in the situation, which is documented by a series of three boundary markers found by archaeologists working at *Aizanoi* in the 1960s, may provide some support for a survey at *Aizanoi* under Quietus depending on how one views their location and bilingual text. The inscription in both Greek and Latin found on these markers, which can be dated to 129 AD, proclaim that Hadrian restored the boundaries given to Zeus the founder and the community of the *Aezaniti* by Attalus and Prusias the Kings, after Septimius Saturninus a *primus pilus* made a measurement like that King Prusias had established.²⁴⁴ The position of the stones shows that they were set up to mark only the outer boundary of the temple's land.²⁴⁵ This prompts two possible reconstructions. The first is that the letter of Quietus was an empty promise that resulted in total inaction on the part of the provincial administration for some two years. This course of events is possible, but unlikely, in part because, as discussed above, the situation in the city seems to have been volatile and because of the damage it would do to Quietus' reputation should the people of *Aizanoi* choose to complain to the emperor himself.

The second and more likely possibility is that some of the landholders at *Aizanoi* resisted the new rents by challenging the extent of the temple's property limits after the ruling of Quietus was issued. While the details of this legal case can only be conjectured, it would have to be based on both the location of the boundary and the rightful ownership of land, displaying characteristics of at least three of the fifteen types of boundary disputes listed by Frontinus.²⁴⁶ Such a complicated legal challenge to the Roman authorities could only have been sustained by those who possessed a comprehensive understanding of Roman law and at least a semblance of knowledge about where the boundary of the temple was purported to be. This would tend to suggest that a survey of some sort had taken place and that the property owners who fought the

²⁴³ Hilali (2010), 35-37, 41-42; Leveau (2010), 70-72; Bertoncello (2010), 77-78, 85-90; Dellong (2010), 94, 110.

²⁴⁴ Kearsley (2000), 140-141.

²⁴⁵ Mitchell and Levick (1988), XXXVIII-XXXVIII.

²⁴⁶ Front. *De Contr.* 2000.4.4-10 = 2005.2.1; 2000.4.19-38 = 2005.2.4-7; 2000.8.3-7 = 2005.2.14.

rents took advantage of whatever information came out of that investigation. This possibility is a sharp reminder that surveyors and their reports could serve interests other than the Roman authorities', stimulating conflict between administrators and surveyors when the case came to court.²⁴⁷

Theoretically, any Roman magistrate could adjudicate a case regardless of its complexity, but the text of the boundary markers mentioned above show that Hadrian took direct responsibility for the final resolution to the situation at *Aizanoi*. He may have chosen to involve himself as a result of a petition addressed to him by the people of *Aizanoi*, though epigraphic evidence indicates that such petitions were usually returned to the provincial governor or assigned to an *iudex* for resolution.²⁴⁸ Having said that, there were instances where the emperor seems to have wished to retain legal authority and control over a dispute as *iudex*, but where his position as emperor made it impossible for him to hear a case in person. In such situations, Hadrian, Vespasian and perhaps emperors going back to Augustus, devolved responsibility to surveyors, who were chosen from the members of the *Domus Augusti* or the ranks of the Praetorian Guard.²⁴⁹ Since slaves, freedmen and soldiers did not normally possess the social and financial requirements to act as an *iudex*, the emperor could theoretically retain that role while allowing a competent subordinate to deal with the practical aspects of a problem.²⁵⁰

Indeed, it was doubtless this practice that provided the precedent for governors to appoint soldiers as representatives for the adjudication or the delineation of boundaries discussed above. The emperor's interest in intervening in these cases was almost always triggered by political, rather than practical considerations. In the case of *Aizanoi*, Hadrian's interest may partly have been aroused by a desire to maintain order in one of the wealthiest provinces in the Empire. Such a concern is manifest by the fact that he sent a senior centurion and military surveyor to carry out the survey and establish the boundary markers without reference to the procurator or governor of *Asia*.²⁵¹

²⁴⁷ Agen. Urb. *De Contr. Agr.* 2000.20.25-26; Sergejevski (1964), 93-95.

²⁴⁸ App. 2.9, 4.61; Plassart (1970), 43, 48, 53-59; Bablitz (2007), 94-95.

²⁴⁹ App. 2.7, 2.48; AE 1983.0944; Devreker (1971), 355.

²⁵⁰ Bablitz (2007), 95-102; Chapter 1 above and Chapter 4 below.

²⁵¹ Compare: Devreker (1971), 355; Fossey (1982), 50, no. 9A and B; Kearsley (2000), 140-141.

Hadrian's primary interest in the matter, however, seems to have been opportunistic. At the time Saturninus was sent to resolve the problems at *Aizanoi*, Hadrian was traveling through *Asia*. As part of his tour, he took the opportunity to rebuild the temple complex at *Aezanai* a grand euergetic gesture, which was intended to enhance his image as a traditional Hellenistic monarch amongst the provincial population of the East.²⁵² Benefactions such as this, along with letters of goodwill, formed the core of the diplomatic dialogue between the central administration and provincial population binding the Empire together.²⁵³ Therefore Hadrian could not allow the on-going dispute over land and rents to continue as it would disrupt not only reconstruction of the temple, but also its future financial prosperity since the rents were earmarked for the upkeep of the temple and its priesthood.

This thrust the work of Saturninus and all the other surveyors involved with the resolution of the dispute at *Aizanoi* into the spotlight of Roman geopolitics, and highlights a point which will become far more palpable in subsequent chapters: when the emperor became involved in a surveying operation, it was no longer a question of local interests, boundary lines and the justice of ownership. The emperor's involvement meant that surveying was a matter of global political power and the establishment of order in a wider world. Such intervention at *Aizanoi* shows that in spite of all of the proconsul's authority and all the surveyors' skill, there were times when not all the proconsul's horses and all the proconsul's men could keep a community together in the end.

²⁵² IGRR 4.572, 4.582, 4.584; Mitchell and Levick (1988), XXXIII-XXXIV; Birley (1997), 215-220; Dignas (2002), 25-32, 179; Cuomo (2007), 118.

²⁵³ Whitmarsh (2010), 6-9; Lavan (2013), 94, 157, 161-173, 217-228.

Chapter Two: Show What You Know and Say What You Mean: The *Agrimensores* and Their Power of Knowledge and Communication

However, a legal dispute that has come up about boundaries is entrusted to a land surveyor (*agrimensor*), so that wanton controversy may be dismissed. He is a judge, at any rate, of his own art; empty fields are his law-court. You might believe him to be some sort of a mad man, should you have caught sight of him wandering tortuous pathways. Accordingly, he searches for evidence through thickets and wild woods, nor does he walk in the common manner. The path for him is a matter of his own choosing, he demonstrates what he means, he proves what he has learned, he discerns the justice of the dispute with his own footsteps and in the fashion of a mighty river, takes vacant areas from some and grants farmland to others.²⁵⁴

2.1 Introduction

Roman surveyors have been described as technical professionals who could be called upon by Roman magistrates and private landowners alike to resolve boundary disputes and structure the landscape to create new colonies. Both Serafina Cuomo and Massimiliano Vinci have spoken of their professional reputation, claims to moral authority and their legal abilities, which gave their pronouncements force in the law courts.²⁵⁵ Yet little attention has been paid to how someone who wished to hire a surveyor could establish the *bona fides* of anyone who might offer their services or assess the quality of their work in a world where professional accreditation did not exist.²⁵⁶ There had to be an understood basis for assessing a surveyor's work and specific characteristics that people expected surveyors to demonstrate when hiring them.

This chapter will look at what a surveyor had to do in order to establish his identity and how he went about proving his qualities on the job. The emphasis will be on the practical and theoretical aspects of knowledge that an informed member of the public might expect a surveyor to demonstrate during the course of a survey and the

²⁵⁴ Cassiod. *Var.* 3.52.8.

²⁵⁵ Cuomo (2000); (2007); Vinci (2008); (2009).

²⁵⁶ Moatti (2006), 119; Mattern (2008), 21-26; Massar (2010), 171.

shared knowledge base which made an assessment of a surveyor's work possible. This chapter will also consider how the surveyor could apply his knowledge base to influence human conduct and perceptions of the wider world over a long-term period.

2.2 Competition, Performance and the Individual Client as Audience

Before proceeding to a discussion of how surveyors established their credentials and influenced people out in the field, it is first worth following the line of investigation employed by scholars such as Susan Mattern, Maud Gleason, Todd Curtis and Natacha Massar in their studies of the rhetorical art of medicine by considering the nature of a surveyor's audience and the points at which the surveyor had to address it.²⁵⁷ The work of all four of these scholars, by studying the narrative sections of Galen's texts along with those of other medical writers and inscriptions associated with the practice of medicine, has pointed out that doctors addressed four different constituencies in at least two very different contexts. On the one hand, doctors addressed potential employers and their competitors before a general audience in public demonstrations of medical skill, which were held in the manner of a philosophical disputation.²⁵⁸ On the other, each doctor, when practicing his craft on a day-to-day basis, had to address his patients, the family and friends of the patients, his students and any rival doctors, who would have been called in to provide an opinion as part of the consultation.²⁵⁹

Identifying the audience and points of engagement for the surveyors is far more difficult. While medical authors record anecdotes about treating patients, the surveyors tend to report accounts of their own abilities that are totally devoid of other people. When they discuss the inhabitants of the landscape in which they work, it is always in abstract terms such as possessors, *coloni* or *veterani*. In addition, where doctors tend to have honorific inscriptions set up to commemorate their abilities, nearly all the inscriptions commemorating surveyors in their own right were sepulchral, providing very little information on how their professional relationships worked within the wider context of Roman society.²⁶⁰ Only one passage from the writings of the *Corpus Agrimensorum* sheds any real light on the inner life of the surveyors. The passage

²⁵⁷ Mattern (2008); Gleason (2009); Curtis (2009); Massar (2010).

²⁵⁸ Gleason (2009), 88-96; Massar (2010), 171-174.

²⁵⁹ Mattern (2008), 72-76, 80-85; (2013); Curtis (2009).

²⁶⁰ See for example: App. 1.1, 1.2, 1.5, 1.11, 1.12, 1.15, 1.19, 1.23; IG 12.6.12.1; IEph. 719, 2212, 2304.

comes from the opening of the work on geometric surveying written by the surveyor Balbus. Balbus structured this work as a letter to his friend Celsus, modelled on the epistolary works of Eratosthenes and Archimedes and drew deeply on the Hellenistic tradition of scientific writing.²⁶¹ The social atmosphere Balbus describes reflects the same highly competitive world of the Second Sophistic found in the writings of Galen.²⁶² It also suggests that the surveyors engaged in many of the same competitive oratorical displays of knowledge, engaging many of the same kinds of audience, as did physicians:

Everyone knows, Celsus, the summit of our profession resides in you. Therefore I decided to offer up to your judgment the first product of my industry. For, although rivalry claims a place for itself amongst equals, I thought that no one amongst our learned profession would promote my efforts more than the man who among them has the greatest ability in this role. Therefore, in order that a more polished version may come to the attention of certain individuals, this book should first hurry to you, bearing all the sorts of things that are already known to you, setting before you the rudiments of an apprenticeship, and sharing with you whatever it was able to receive from me in the midst of my military service. And if it is worthy to go before everyone's eyes in public intercourse, it should most appropriately begin with you. Because, if you feel that too little diligence and attention have been applied to the work and thus it seems to be remiss in any respect, I shall achieve no small reward for my labour if I should through your advice take the judgment of unfriendly critics as a gain. And so, I ask, if it is not improper, that you excuse the work to the extent that it could not be brought to perfection at the time when, while our opinions were running strong, this sort of instruction was under discussion.²⁶³

Here Balbus describes a world with a stratified hierarchy, in which teachers and former fellow students promote one another to gain an advantage over competitors through a superior display of not just technical skill, but through superior eloquence and writing as well. While Halsey Royden does not include a *collegium agrimensorum* in her landmark study of the professional associations of Italy, it is likely that much of this professional competition was exercised through the *collegia*, where books such as that composed by Balbus could be circulated for public and private reading, and where debates about professional matters could be conducted before an appreciative

²⁶¹ Roller (2010), 270, no. 4; Roby (2014), 36-39.

²⁶² Mattern (2008), 7-12; Gleason (2009), 86-87.

²⁶³ Balb. *Ad Cels.* 204.1-15.

audience.²⁶⁴ As Liba Taub has pointed out, what modern scholars term scientific literature was not necessarily considered as such in antiquity where authors from Aristotle, Euclid and Archimedes to Vitruvius, Pliny the Elder and Avienus argued about technical matters, circulating their ideas in a variety of different styles and media.²⁶⁵ For surveyors, perhaps more than any modern scholar or scientist, the ability to secure patrons rested on their reputation as technical experts, making public access to both their written material and the verbal exchanges, which proved their craft, crucial for the development of a public *persona*. Thus, as Brian Campbell and Serafina Cuomo have argued, surveying texts did not simply circulate within the narrow confines of the surveying community since they were crafted for a wider audience and formed part of a wider public discourse about knowledge, social identity and power created through the deployment of oratory, written texts and the manipulation of mathematics.²⁶⁶

Understanding the discourse and its impact upon the legal ownership of land within the Roman world was crucial since the only regulations found in the *Digest*, which restrained the conduct of surveyors, required private citizens to sue the surveyor for fraud.²⁶⁷ As a consequence, unless a surveyor happened to be a slave loaned out for a particular job by their master, surveyors, like architects and doctors, had to engage a potential employer as their first audience and provide a demonstration of their professional knowledge and competence.²⁶⁸

2.3 Audience, Action and Performance in the Field

Once engaged, a surveyor's audience expanded. The passage of Cassiodorus quoted at the opening of this chapter suggests that there were three phases to the resolution of a boundary dispute with three different sorts of interaction between the surveyor and his audience: the investigation, report and demonstration. As Cassiodorus and numerous passages from the *Corpus Agrimensorum* indicate, the first stages of an investigation predominantly involved a systematic examination of physical evidence such as

²⁶⁴ App. 1.19; Royden (1988), 105-111, 191-194; van Nijf (1997), 170-181; Verboven (2007), 871-876; Habinek (2009), 121-126; Parker (2009), 196-205.

²⁶⁵ Taub (2013), 335-339.

²⁶⁶ Campbell (1996), 76-77, 78, nos. 15, 99; Cuomo (2000), 195-199; (2002), 174-177; (2007), 107-112; (2011a), 167-172; König (2007), 187-190.

²⁶⁷ Paul. *Dig.* 11.6.2-3, 5.

²⁶⁸ Vitr. *De Arch.* 1.1.10; Aul. *Gel. NA.* 6.17.1; 19.10.2-4; Cic. *Ad Att.* 2.3.2, 2.4.7, 13.29.1, 14.3.1, 14.9.1; *Q. Fr.* 2.2.1; *De Nat. Deo.* 1.72; König (2009), 37-40.

boundary markers out on the land. Such activities required only limited interaction between the surveyors and those who lived in the landscape under study. Several passages from the *Corpus*, however, also show that the surveyors frequently had to consult with land-holders and cross-reference written records and inscribed monuments. The language of these passages illustrates the imperative sense of mission the surveyors felt in their work as well as the detached, impersonal attitude they seem to have taken toward people whose land they surveyed:

Truly, if someone should raise a question concerning the *pagi* themselves, the troublesome bother of a serious case will be stirred up. One must consider, as we have frequently discussed, by whom from amongst the communities on either side of the borderland is rented out. Furthermore, supplies frequently have to be provided at public expense to a praetorian soldier or to any other dispatch rider, and if firewood or straw is required, one must enquire into which *civitates* with which *pagi* have been accustomed to provide this sort of service. In addition, some regions are accustomed to make different kinds of sacrifice: therefore, the way in which a *pagus* conducts its sacrifice must be considered.²⁶⁹

And an investigation must be conducted into this sort of situation: whether an understanding has been established between two land-holders concerning a particular (field) within the allocated area of either party, who are clearly established on the bronze record (*tabula*) and in the written copy of the map (*forma*), although the principal owner sold the field in question. And in fact, I have discovered this (sort of situation) in *Samnium*, where the property which the divine Vespasian assigned to veterans was possessed by those people to whom it was allocated, but in a different manner. For some had purchased certain areas and incorporated this acquisition into their own territory, by marking out a property line at a road or at a stream or at whatever other sort of feature might suit. But, neither those selling their allotments, nor those purchasing and adding to their own property, worked out the exact area, but rather bought and sold as if each area was, as I said, delineated by a road or stream or whatever other sort of feature suited. Therefore, how is it possible for the bronze record to be applied, if as I said, an agreement has been entered into concerning the property between two people, who are in dispute about it?²⁷⁰

In these two passages, the authors of the *Corpus Agrimensorum* illustrate the importance of integrating information from a variety of sources to resolve problems. In the first passage, where the structural identity and ownership of a *pagus* was in question, the investigator had to find out who rented what property and where that property was located. But the surveyor also had to find out who carried out specific

²⁶⁹ Sic. Flac. *De Div. et Ass.* 2000.132.11-15 = 2010.4.59.

²⁷⁰ Hyg. *De Gen. Contr.* 2000.96.28-98.2.

duties for the Roman administration and how religious sacrifices were conducted in order to distinguish the cultural identity of different communities. The importance of direct interaction with land-owners in the acquisition of such information is emphasised in the second passage, where a surveyor attempted to resolve a dispute between land-holders based on documentary records only to discover that the land-owners had made their own arrangements without respect to the formal procedures of surveying. Even when those living on the land did respect the work of surveyors, information provided by people and gleaned from the physical evidence found in the landscape could sometimes only be reconciled with the written records by hours of quiet reading in archives or libraries, piecing together bits of information through deductive reasoning.²⁷¹

In addition there is a document termed an “interpolated bronze record” (*tabula*). It so happens that veterans, who were settled by the Divine Julius Caesar at one time, later took up arms again for Augustus; and once the wars had burned themselves out, the victorious soldiers returned to their own lands. However, other (veterans) received land in the place of those who had died. For which reason it happens that within these centuries are found the names of both those who were settled before and those who later succeeded to their place. This is something which I discovered to be the case from this particular oddity: when I was calculating the area of ascribed land distributed and the (number of) centuries exceeded the size (of the area), I returned to the primary origin of the allocation and discovered that names had been added later in this situation, about which I have already expressed my opinion above.²⁷²

Since much of the investigative work mentioned by Flaccus in this passage involved a close examination and comparison of documents, the work would have been done exclusively in the presence of what Pascal Arnaud has argued were specially trained archivists tasked with looking after property records and the surveyors’ maps or *formae*.²⁷³ This meant that conclusions such as those recounted by Siculus Flaccus would have been formed before a very limited audience. Surveyors could only use them to influence the wider audience of land-owners and magistrates when they issued their formal *renuntiatio* or report and undertook their *demonstratio* to validate their findings. Details about these two juridical activities are limited, but a passage from the twenty-

²⁷¹ Aul. Gel. *NA*. 11.17.1; Cic. *De Fin.* 3.7-8; Parker (2009), 196-199; Neudecker (2013), 212-216.

²⁷² Sic. Flac. *De Div. et Ass.* 2000.128.30-37 = 2010.4.44-45.

²⁷³ App. 4.42, 4.60, 4.64; AE 1982.0433; Cic. *De Leg.* 2.46; Hyg. *De Cond. Agr.* 2000.84.30-33 = 2010.2.33; Sic. Flac. *De Div. et Ass.* 2000.120.26-31 = 2010.4.3-4; Arnaud (2003), 18-20.

fourth book of Ulpian's *Edicts* and several inscriptions, which include the well-published bilingual inscription from Delphi, show that they were two separate activities in a multi-stage process.²⁷⁴ According to the text of Ulpian, once a surveyor had made his report on an investigation, he was open to prosecution for fraud should it be suspected, even if the report was delivered by a third party.²⁷⁵ Ulpian's observations substantiate two points. First, that the surveyor's *renuntiatio* formalised and legitimised his actions. By issuing a *renuntiatio* the surveyor established a factual basis for the resolution of a dispute under litigation by an *iudex* or arbitrator. Second, since a person other than the surveyor could deliver the *renuntiatio*, this activity was what Elizabeth Meyer has described as a *recitatio ex tabulis*, or a ritual reading of a formulaic text from tablets before the presiding magistrate and an audience comprised of those who were concerned in the matter.²⁷⁶

The clearest illustration of how surveyors merged verbal delivery with performative acts and the production or manipulation of documents comes from three separate *decreta* which have been found in the Greek countryside. One, which will be considered below, was found in the ruined church of the Holy Trinity north of Ellassona. The text chronicles the restoration of a boundary running along the border between Thessaly and Macedonia separating territory belonging to *Doliche* and *Elemeia* by Verginius Publianus on the 27th of March 101 AD.²⁷⁷ The other two are parts of the bilingual inscriptions found at the Temple of Apollo in Delphi and published by André Plassart.²⁷⁸ The texts preserve a series of disputes adjudicated by Gaius Avidius Nigrinus in either 110 or 114 between the people of Delphi and several other communities to the north and east.²⁷⁹ While none of these documents were drafted by the surveyors themselves, the two documents illustrate the performative operations undertaken both by surveyors and local land-holders in defining a boundary, while the text from the Church of the Holy Trinity helps to illustrate the range of performative procedures undertaken by surveyors in the field.

²⁷⁴ Plassart (1970), 46-63; Rousset (2002), 91-94, 143-149; Arnaud (2006), 70-72; Cuomo (2007), 114-117.

²⁷⁵ Ulp. *Dig.* 11.6.1.2.

²⁷⁶ Meyer (2004), 45, 50-52, 73-74.

²⁷⁷ Lucas (1997), 101, 105-107.

²⁷⁸ Plassart (1970), 43.

²⁷⁹ Cuomo (2007), 114.

In the earliest of the disputes, recorded in the first column of the inscription (Fig. 2.1), Nigrinus used a prior ruling by the jurist Gaius Cassius Longinus, whose work is cited in the *Corpus Agrimensorum* as an authority on land-law, and the documents filed by the surveyor Valerius Iustus to resolve a dispute between the people of Delphi and the people of *Ambryssos*:²⁸⁰

These words were read aloud from the tablets when Gaius Avidius Nigrinus was propraetorian legate of Augustus, 15 days before the Kalends of October (17th of September). Since the authority of prior legal decisions must always be preserved, one ought now to pay attention to the decree which Longinus issued in the dispute between the people of *Delphi* and the people of *Ambryssos*, which they had brought before the emperor, in which he (Longinus) assigned to them the surveyor Valerius Iustus, and the determination (*determinatio*) for the extent of the boundaries was produced by him. For it would appear from the letter of this man (Longinus), which was publicly addressed to the people of Delphi, that neither the people of *Ambryssos* or the people of Delphi rejected the determination until many years had passed. In accordance with the ordinances of Longinus, in the boundary dispute between the people of Delphi and the people of *Ambryssos*, it is agreed that I rule in accordance with the determination (for the extent of the boundaries) produced by Valerius Iustus. In *concilium* were Quintus Eppius, Flavius Arrianus, Gaius Papius Habitus, Titus Livius.²⁸¹

Within this text, there are three degrees of verbal and performative action united in the final written form of the *decretum*. Longinus, who was consul in 30 AD, was ordered by the emperor to adjudicate a dispute involving a boundary between the people of Delphi and the people of *Ambryssos*. He appointed a surveyor, Valerius Iustus, to assess the line of the boundary and pronounce an opinion on it. That opinion was presumably delivered to Longinus. The *iudex* then incorporated the *renuntiatio* of Iustus into a *decretum*, which was issued in writing to the people of Delphi. Later, Nigrinus used this documentary record to resolve a fresh altercation between the two parties over the exact same boundary-line by invoking the need to respect the prior rulings of Roman officials. What is unclear from the text is the extent to which Iustus carried out his work under public scrutiny and the extent to which he was working to re-establish the results of a prior survey. The *decretum* issued by Verginius Publicanus, along with other evidence, however, indicates that his actions were observed by an audience and that he was re-establishing the line of a boundary which already existed rather than a

²⁸⁰ Hyg. *De Gen. Contr.* 2000.90.25-26 = 2010.3.3; Campbell (2000), 475; Guillaumin (2010), 100, no. 6.

²⁸¹ Plassart (1970), 43, nos. 290-291.

new one instituted by the imperial administration. Publianus, in issuing his verdict, which was recorded on the stele from church of the Holy Trinity (Fig. 2.2), does not use the word *determinatio*; however his language makes it clear that like Longinus he was restoring a boundary:

When the Emperor Caesar Nerva Trajan Augustus Germanicus, for the 4th time, and Quintus Articuleius, were consuls, on the 6th day before the Kalends of April (27th of March). This was copied and authenticated from the journal of Verginius Publianus, the judge appointed by the emperor Trajan, which Caelius Niger brought out and in which was written that which is written below. Since it has been proven to me that the convergent boundaries inscribed on the stone stele which is located in the forum of Doliche, are those in the precise royal definition of boundaries (*definitio*) created by Amyntas, father of Philip, between the people of Doliche and the people of Elemeia, it is agreed that the boundary is (a line starting) from the boundary stone which is on the road above *Geranae* (and running) between *Azzoris* and *Onoareae* to *Petraeae* in Doliche. (The line runs) over the top of the ridge through the plain which is called *Pronomae*, in such a manner that the plain is in the territory of the people of Elemeia and then along the top of the ridge to ...²⁸²

Ulpian, in a passage of his *Edicts*, used both *determinare* and *definire* in a single sentence, suggesting that while they were related activities as part of the formulary practice of Roman law, each term had its own meaning and involved slightly different formulaic procedures.²⁸³ In discussing the terminology found in the *Corpus Agrimensorum*, Brian Campbell has observed that much of the surveyors' vocabulary was not particularly technical or specialised, and that their vague formulations left the full nature of the actions required for any given situation to the interpretation and discretion of the surveyor on the ground.²⁸⁴ Arnaud, however, who recognised the difficulties pointed out by Campbell, has argued that, for much of Roman history, *definitio* referred to the documentary and formulary process involved in creating a boundary, while *determinatio* referred to the process used to re-establish, alter and formalise an existing boundary.²⁸⁵ It would seem that the Romans, in keeping with their preference for using an established historical moment as the datum for organising land in the provinces, distinguished between the formal actions used to create a boundary for

²⁸² App. 4.29.

²⁸³ Ulp. *Dig.* 50.16.60; Meyer (2004), 79-84; Bablitz (2007), 53-58, 134-135; Neudecker (2010), 161-164; Metzger (2010), 31-34.

²⁸⁴ Campbell (2006), 173.

²⁸⁵ Arnaud (2006), 72-74.

the first time and those used to re-establish a boundary or the ownership of land.²⁸⁶ This is certainly the sense one gains from comparing the *decretum* issued by Verginius Publianus with another issued by Nigrinus, which forms the third column of the text in the inscription from Delphi (Fig. 2.3):

(Issued) 10 Days before the Kalends of October (22nd of September) at Elatia. With respect to the dispute of the people of Delphi against the people of Amphissa and the people of Myania concerning boundaries, which the Optimus Princeps ordered me to investigate: once both sides had been heard many times and the sites which they were in dispute about were both traversed and inspected in accordance with the formal presentation (*demonstratio*) of their features by both parties, and I had also verified the documents pertaining to the matter through a careful assessment, I summed matters up in this decree. Since the *Optimus Princeps* ordered (me) to stand by the (*sententia*) judgement of the *hieromnemes* that was made on the authority of Manius Acilius and the Senate, and since the determination (*determinatio*) (of the extent of the boundaries) made by the *hieromnemes*, which was inscribed on the side of the Temple of Apollo at Delphi, has been brought before me, it is agreed that according to the (*determinatio*) determination, (the line) from *Trinapea*, which is an overhanging clifftop above the valley called Charadron where there is a spring (called) Embateia, all the way to the afore-mentioned spring, is (the boundary) of the territory of the Delphic people, which overlooks the Delphic community. From this spring, since the determination (*determinatio*) shows that the boundary must be aligned with Astrabas, it is agreed that (the boundary-line) up to the marker-stone (*terminus*), which has been pointed out to me on a certain clifftop called Astrabas not far from the sea, on which a boundary mark (*terminus*), which is considered to be a special symbol of the sacred lands of the Delphic community, has been engraved, is (the extent) of the territory of the Delphic people, which has been shown as sloping toward the left in the direction of the Delphic community all the way to the sea...²⁸⁷

For the surveyors, magistrates and litigants mentioned in this inscription, surveying was a discursive activity which was defined by formalised speech, observation, gesture and movement through familiar spaces learned not so much from books as from the common experience of living on the land.²⁸⁸ The documents employed in this context, whether housed in a local archive or inscribed on boundary-markers and monuments situated in the landscape, were symbols of enduring memory

²⁸⁶ Chaniotis (2004), 193; Gargola (2004), 131-134; Arnaud (2006), 73-74, 77.

²⁸⁷ App. 2.6.

²⁸⁸ Lucian. *Icaro*. 18; Apul. *Met.* 9.35; Col. *RR.* 5.1.2-4; Chouquer (2010), 89-91; Tilley (2012), 24-26.

and an expression of power whose voices transcended time and distance.²⁸⁹ Each document or monument, like each witness who walked the land pointing out its features, articulated views on how the land was organised in the past or about how it should be organised in the future. Surveyors, by the very nature of their craft, had to enter into this performative discourse and negotiate its intricacies to formulate a resolution that all parties could accept even if they did not like it. They did so by listening to the land-owners, reading the documents and observing the matrix of monuments and markers structuring the cultural memories etched into the landscape in order to discern a specific kind of truth. This highly subjective understanding of truth about a place was formulated through an ontological filter created by elements of Stoic, Epicurean and perhaps Peripatetic philosophy, Roman law and the Hellenistic mathematical tradition.²⁹⁰

In many ways, the surveyors, like modern archaeologists, were involved in a historical inquiry into how people lived on the land and the past and present ways in which they thought about the land they inhabited.²⁹¹ Unlike modern archaeologists, however, surveyors did not always have to take exact measurements as a modern scientist would be expected to do in order to prove their interpretation of the land. Often it was enough for surveyors to present an interpretation of the evidence congruent with the cultural memories and social conditions of a particular place to foster the precise discourse between people that facilitated *consensus* about human control over space and the structural organisation of the landscape. In other situations, only a surveyor's deployment of exact figures and precise readings of documents illustrating the truth about a place or its extent could negotiate the gap between an abstract understanding of space and the everyday lived experience of a particular place. To fully appreciate how surveyors constructed a persuasive performative argument in order to achieve this objective, the rest of this chapter looks at the surveyors' deployment of deductive observation, movement, mathematics, juridical taxonomy and the philosophy of geographic theory.

²⁸⁹ Woolf (1996), 25-28; Eck (2004), 10-11; (2009), 90, 92; Habinek (2009), 122-124.

²⁹⁰ Alcock (2001), 327; Guillaumin (2005), 193, no. 144 ; Cuomo (2007), 112-113; Lehoux (2012), 94, 98, 104; Roby (2014), 11-12; Geus (2014a), 118.

²⁹¹ Hyg. *De Cond. Agr.* 2000.80.34-37 = 2010.2.16; Campbell (1996), 81-82; (2006), 174, 180; Bonnie (2009), 41-42.

2.4 Elementary My Dear Nigrinus: Observation, Articulation and Understanding

The commonplace cliché that many people see but do not observe was already old when the satirist Lucian noted that a person who is not trained to view something properly is content to look on in silence and gesticulate meaninglessly, while the trained observer takes in whatever is before their eyes and articulates a fitting explanation or reply to illustrate understanding and eloquence.²⁹² While Lucian's explication of this *topos* comes in the context of a dialectic on the appreciation of art, it remains a valuable source because, as Simon Goldhill and Michael Squire have both remarked, it places the "scopic regime" of learned viewing or observation, which the surveyors frequently invoke, into the wider sociological and rhetorical context of the Second Sophistic.²⁹³ Within this specific social context, viewing was a divisive phenomenon in which the trained viewer formulated an expert opinion on a given subject by reconfiguring what was taken in through the eyes with a carefully articulated response using appropriate words, gestures and actions.²⁹⁴ As Daryn Lehoux has explained, the cultural construction of viewing that predominated amongst educated people was grounded in the physiological understanding of vision and the all-important skill of rhetoric, which covered not just argumentation for the Romans, but also housed many of the theoretical applications of logic bound up with what might be termed scientific investigation.²⁹⁵

Amongst the mathematical and scientific community of the Roman world, the dominant theory of optical vision depended on the extramission of what modern translators term *numa*, a concept common enough that it found its way into popular novels of the period.²⁹⁶ According to Galen and Ptolemy, *numa* was generated from the brain via nerves into the eyes, from whence it emanated out into the world as radiating cones.²⁹⁷ These cones of *numa* then seem to have interacted with the boundaries between light, air and the substantive nature of colour, in order to produce sight by drawing the essence of things into a person and producing thoughts in the mind through

²⁹² Lucian. *De Dom.* 2.

²⁹³ Goldhill (2001), 160-162; Campbell (2006), 179-180; Squire (2009), 239-244.

²⁹⁴ Goldhill (2001), 161; Matern (2008), 42-43, 78-79; Squire (2009), 242-243.

²⁹⁵ Lehoux (2012), 80, 89-94, 109-110.

²⁹⁶ Goldhill (2001), 176, 178; Lehoux (2012), 120.

²⁹⁷ Gal. *De Usu Part.* 8.6; Gal. *De Pl. Hip. Et Plat.* 7.5.5, 7, 32, 41-44; 7.6.10; 7.7.20; Ptol. *Optic.* 2.7, 16, 18, 23, 63.

what the Stoics term *phantasia*.²⁹⁸ Once the essence of things was imprinted upon the mind, they stimulated further thoughts, which by their nature had to be externalised through speech, writing and physical action shaping human experience and allowing people to communicate with others across time and space.²⁹⁹ This communicative faculty meant that the way one studied an object, as well as the words, phrasing and gestures used in responding to it, were significant when establishing an air of authority in technical matters.

Like Galen and Ptolemy, who provide much of the technical information on this concept of visual perception, the surveyors drew upon the core concepts in Greek mathematics and science, internalising and regurgitating parts of literature on subjects such as art, architecture and medicine in comparative or illustrative exempla to explain their own work.³⁰⁰ It is important to recognise, however, that while the surveyors may have internalised this optical theory, they never discussed its details, but simply described the act of conducting an examination as part of resolving a problem in surveying.

The authors of the *Corpus Agrimensorum* deploy observation and visual investigation in two different contexts, which might be described as recuperative and transformative. While quite distinct in their ends, both modes of viewing depended upon the epistemological argument that the reasoning faculty in people could learn to draw conclusions from the interaction between ideas in the mind and physical objects in the world mediated by the sensations of sense perception, primarily produced by the *numa* radiating out of the eye.³⁰¹ Such rational conclusions could in turn be combined with speech, gesture and the very act of looking itself to transform other peoples' understanding of the world around them. The role of this conception of visual observation in a purely recuperative or affirmative context is most palpable through the surveyors' discussion of boundary restoration, where, as the texts quoted above show, they used visual observation to establish the validity of documents, but most

²⁹⁸ Goldhill (2001), 162, 176; Lehoux (2012), 120-125, 117, fig. 5.1.

²⁹⁹ Lehoux (2012), 117.

³⁰⁰ Hyg. *De Cond. Agr.* 2000.80.18-20 = 2010.2.10; Hyg. *De Gen. Contr.* 2000.98.35-36 = 2010.3.33; Balb. *Ad Cels.* 2000.206.34-42; 2000.212.1-8; Tybjerg (2004), 31-35, 40-41, 46-48; Lehoux (2012), 116; Roby (2014), 39-45; Geus (2014a), 118-120.

³⁰¹ Agen. *Urb. De Contr. Agr.* 2000.16.7-18.11; Ptol. *Opt.* 2.16; 2.18; 2.22; 2. 73; 2.83-86; Lehoux (2012), 125-129.

significantly in the identification of boundary-markers and the interpretation of systems for boundary demarcation:

If a (legal challenge) concerning a boundary is undertaken, property which is within the five or six foot gap (between the boundary-lines) is called into question, since the space is either occupied as a right of way by those travelling to the fields, or else it (is used) for the turning of a plough, which makes it impossible for it to be occupied through the custom of *usucapio*. Indeed, a pathway, because it leads to fields under cultivation, cannot be occupied by the custom of *usucapio*. A boundary is established by many types of evidence, in which case, one must observe (whether it is done) by boundary stones, or by notched trees, or ditches, or roads, or rivers, or mountain ridges, or watersheds, or as is customary, by thorn-hedges, or terraces, or by straight-line boundaries (*rigores*) with regular right-angles and a fence-line, or as I have discovered here and there, by raised beds of earth at the borders between the fields, or yet again as is frequently the case, by uncultivated strips of land. These are generally the sorts of things that are habitually observed to be boundaries.³⁰²

The exact nature of boundaries and the impact of legal taxonomy on their formulation will be considered in a moment. Here it is important to focus on the fact that the author of this passage makes it clear that surveyors, through both training and practical experience, had to learn to observe the different physical characteristics of particular markers and recognise the various types of marker used to denote different systems for boundary-marking. He goes on to describe twelve different methods used to denote a boundary, which, like the symptoms of a disease or broken bones in the body of a doctor's patient, could be used to discern the nature of the landscape and the characteristics of a dispute.³⁰³ The list seems to be presented in a descending order of value from the most to the least efficacious system of demarcation. The most secure way of defining property was the *terminus* or stone boundary-marker. These monumental markers came in a variety of forms with some, such as the Tiburtine, being elaborately carved, while others were simply inscribed with a letter or number to denote the identity of a land-owner or their place in a survey grid.³⁰⁴

As Thomas Habinek has observed, the habit of inscribing stone markers with abbreviations, numbers and ornamental relief sculpture was a decidedly Roman act of

³⁰² Hyg. *De Gen. Contr.* 2000.92.10-19 = 2010.3.7.

³⁰³ Cuomo (2007), 15-16.

³⁰⁴ Hyg. *De Gen. Contr.* 2000.92.20-27 = 2010.3.8-9; Sic. Flac. *De Cond. Agr.* 2000.104.34-106.13 = 2010.2.4-5.

scribal appropriation, though the practice may have originated with the Etruscans.³⁰⁵ Reading these stones, which were frequently peculiar to a specific locality, depended upon a surveyor being embedded in the epigraphic culture of Roman society and deductive reasoning based on the conception of visual perception and mental comprehension discussed above.³⁰⁶ A key demonstration of this deductive faculty presented in the *Corpus Agrimensorum* was the need for surveyors to distinguish proprietorial *termini* from honorific grave *cippi*, when both were present on or near to what people believed to be a boundary.³⁰⁷ Surveyors made the distinction by visually matching similar patterns of inscription and ornamentation on stones, which formed a discrete line across the landscape, rejecting any stones that were either out of alignment with the rest of the pattern or carved differently from the majority of markers forming the pattern of the boundary. The surveyors utilised the same system of close reasoning when people chose to delineate their boundaries by marking lines or crosses on natural stones or by heaping up mounds of stones or by establishing dry stone walls and ditches. The objective was to distinguish between monumental features deliberately created to mark a boundary from features intended as barriers for the protection of livestock or that were the product of land-clearance.³⁰⁸

While the surveyors lavished a great deal of attention on identifying and describing various types of boundary markers as the most sophisticated system for marking a boundary, the bewildering array of methods used for deploying stones make it difficult to establish whether the surveyors maintained a qualitative taxonomic hierarchy for the various types of stone marker described in the texts. The practices used for marking trees as *termini*, however, first studied by Brian Campbell, display some clear details of a tripartite hierarchical taxonomy employed to distinguish between different grades of thorn-hedges and tree-lines. Within this taxonomic classification, Campbell has identified three distinct categories: *arbores ante missae*, *arbores intactae* and *arbores notitae*.³⁰⁹

³⁰⁵ Edlund-Berry (2006), 117, 120; Habinek (2009), 114-140.

³⁰⁶ Cuomo (2007), 125; Eck (2009), 91-94; Bodel (2010), 108-109.

³⁰⁷ Hyg. *De Cond. Agr.* 2000.80.5-13 = 2010.2.6-7; Sic. Flac. *De Cond. Agr.* 2000.106.14-18 = 2010.2.6.

³⁰⁸ Hyg. *De Cond. Agr.* 2000.80.14-15 = 2010.2.8; Hyg. *De Gen. Contr.* 2000.94.4-5 = 2010.3.14; Sic. Flac. *De Cond. Agr.* 2000.106.19-21 = 2010.2.7; 2000.108.23-27 = 2010.2.13; 2000.114.3-17 = 2010.2.35-37; 2000.114.20-35 = 2010.2.39-42; 2000.116.6-8 = 2010.2.45.

³⁰⁹ Campbell (2006), 179-180.

Arbores intactae seem to have been regarded as the least reliable method of marking a boundary since the practice simply considered either cutting down all trees on a boundary with the exception of one specific species which was left standing with its branches pruned, or else planting a specific type of tree that was different from those cultivated by the land-holders.³¹⁰ Distinguishing arboreal markers of this classification was therefore mostly an exercise in identifying species of tree and working out local patterns of cultivation in the region.³¹¹

By contrast, *arbores ante missae*, though Campbell considers the category vague for some reason, were clearly trees that were planted before the boundaries of a property were established and which were identified as boundary-markers by drilling a hole in the trunk and inserting a wooden peg.³¹² In many cases, land-holders added further security to boundaries marked in this way by planting thorn hedges, which acted as a fence-line between the trees.³¹³

The most secure method of marking a boundary with trees, however, was referred to as *arbores notitae*. These were lines of trees specifically planted to mark a boundary and were identified as such with a scar carved into the side of the trunk facing away from the land-holder's property.³¹⁴ The true value in this system was not just that the trees were marked, but that they were planted to form a clear straight line of sighting, much as the stone markers discussed above.

The essence of the taxonomy presented in this system of boundary-marking used on trees lay in the ease with which the trees could be identified as markers through visual signs. Moreover, the inherently visual method of identification was at the heart of surveying, particularly in regions in which Roman notions of boundary-marking might not be practiced. As the author of the *De Generibus Controversiarum* explains, in situations where two land-holders made conflicting claims about the extent of their property without any reference to maps or written documents, a surveyor had to

³¹⁰ Sic. Flac. *De Cond. Agr.* 2000.110.1-10 = 2010.2.15-17.

³¹¹ Hyg. *De Cond. Agr.* 2000.80.21-28 = 2010.2.11-13; Hyg. *De Gen. Contr.* 2000.96.16-19 = 2010.3.21.

³¹² Hyg. *De Cond. Agr.* 2000.80.21-23 = 2010.2.11; Hyg. *De Gen. Contr.* 2000.94.8-14 = 2010.3.14; Sic. Flac. *De Cond. Agr.* 2000.116.11-27 = 2010.2.47-52; Campbell (2006), 179.

³¹³ Sic. Flac. *De Cond. Agr.* 2000.110.1-10 = 2010.2.15-17.

³¹⁴ Hyg. *De Cond. Agr.* 2000.80.21-23 = 2010.2.11; Hyg. *De Gen. Contr.* 2000.94.8-14 = 2010.3.14; Sic. Flac. *De Cond. Agr.* 2000.116.11-27 = 2010.2.47-52.

physically look at the patterns of cultivation, topographical features and any man-made markers situated in the landscape.³¹⁵ The more visible the signs, the easier it was for a surveyor to take in and gather the signs and images in their own mind to form a picture of the landscape as it should be. But, like the expert critic of art presented by Lucian, the surveyor's interpretation of the evidence gathered through observation of the landscape only became meaningful as part of an expert opinion, when he issued his *renuntiatio* in the presence of the litigants and their arbitrator or judge. Here, sight, gesture and utterance would have been forged into an ontological whole, as the surveyors narrated the historical significance of features in the landscape, and with their index finger following their eyes, as they turned them to the fields and monuments, pointed out the evidence of their argument for the benefit of the audience.³¹⁶

2.5 Paths of Knowledge: Observation and Movement in Landscape Formation

Each act of observation used to recreate boundaries, as surveyors did at Delphi under Longinus and Nigrinus, depended upon a previous act of surveying, in which the boundaries were first created or defined. Delphine Acolat remarks that the Romans, perhaps through contact with the Etruscans, adapted the practice of creating inscribed markers, which were set up at inaccessible, though highly visible, points in the landscape.³¹⁷ As she further notes, inscriptions such as those from Delphi show that many of the markers created by Greeks and Romans alike, though different in their use of language or iconography, were nonetheless deployed to complement features such as hills or mountain ridges, which were recognised as lines of demarcation in their own right.³¹⁸

Complementing such natural lines of demarcation with abstract lines denoted by monumental markers, particularly where the distances between each point was measured and recorded, was a conscious effort to dominate and order an otherwise

³¹⁵ Hyg. *De Gen. Contr.* 2000.94.28-96.3 = 2010.3.16-17.

³¹⁶ Lucian. *De Dom.* 2; Quint. *Inst.* 11.3.66, 70, 72; 11.3.85-87, 94; Cassiod. *Var.* 5.52.8; Sic. Flac. *De Div. et Ass.* 2000.128.30-37 = 2010.4.44-45; Plassart (1970), 53-54, nos. 292-293.

³¹⁷ Acolat (2005), 34-35; Edlund-Berry (2006), 121-122.

³¹⁸ Plassart (1970), 53-59, nos. 292-295; Acolat (2005), 33, 35-36; Habinek (2009), 119.

irregular landscape in both visual and mathematical terms.³¹⁹ Like the *renuntiatio* of the surveyor, which re-established the validity of an observed line of control, each measured interval between markers was the external expression of control, derived from a visual observation and human movement across the landscape, which was guided by the philosophical principles of geometry. This is what might be termed the transformative mode of observation. It was the act creating the structural organisation and geometric pattern of a landscape which surveyors like Iuventius later recovered or affirmed.

To grasp the implications of this concept for surveyors and their impact on those whose land they organised, it is important to recognise that the ownership of land is dependent upon both the human occupation of a given place and the way in which it is occupied. As Gerard Chouquer has explained, this is essential since land as a resource does not truly exist, but rather comes into being through the assertion of control by human beings based on their occupation of a given place in the landscape.³²⁰ To paraphrase the concepts of the anthropologists Tim Ingold and Alberto Corsin-Jiménez, land as place is defined by the cultural understanding created through the agency of occupation, a process bound up with sensory perception and the tasks of dwelling.³²¹ An individual might experience the landscape in a variety of ways. The crucial factors in establishing the kind of control Chouquer has in mind, however, are the interactions between people, their environment and the memories of these interactions, which each person takes into their mind through the nervous systems starting at the eyes, ears and skin.³²² Put in anthropological and linguistic terms, used by Christopher Tilley and Martin Thiering, these interactions were and are determined by the movement of individuals under given conditions regulated by language, gesture and the mental models, which provide the implicit cognitive processes of deduction for understanding and organising these experiences in long-term memory.³²³

For the surveyors and most people past and present, it was words, numbers and images that comprised the components of this dynamic encoding of past and present

³¹⁹ Cuomo (2000), 192-193; Ingold (2007), 81.

³²⁰ Chouquer (2010), 89.

³²¹ Ingold (2000), 153-162; Corsin-Jiménez (2003), 141-150.

³²² Ingold (2007), 76-79; Chouquer (2010), 90-91; Thiering (2014), 271, 278-279.

³²³ Tilley (2012), 18-19, 22; Thiering (2014), 269, 277, 279, 283.

experiences, derived from states of being and becoming created by movement. As Tilley, Thiering and Jean-Marie Kawalski have all discussed, each person constructs an understanding of where they are and their relationship to other people derived from a finite number of cues in the environment, interpreted in terms of anthropogenic conceptions of scale and a relative frame of reference.³²⁴ Put another way, each person moving across an ocean or through a landscape will situate, describe and assert some sort of authority over the people and objects they perceive. They can use either their own position as a frame of reference, another relative point outside themselves such as a boulder or the front of a house, or else an abstract absolute conventional point of reference such as the cardinal directions. Moreover, they will also scale people and objects in relationship to their own body, and chronologically in terms of their own diurnal experience.³²⁵

In gathering together perceptions filtered through this ontology, Tim Ingold has argued that human beings inhabit the landscape either as a wayfarer, who moves along a continuous path of interaction with the landscape, or else as a traveller, who follows segmented lines of transport between two or more destinations.³²⁶ For what Ingold calls the wayfarer, movement through the landscape and the observations made through that movement are a way of life, while the traveller focuses on the significant activities at a given destination and takes the most direct line between any two given points. Both modes of perception generate an understanding of the world, but where the wayfarer interacts with the environment, learning it through constant experience the traveller dissolves the intimate bond between locomotion and perception through the introduction of quantified lines connecting points in the landscape. These connective pathways tend to act as lines of domination rather than habitation, since they tend to be built across country without regard for the natural paths of movement in order to unite nodal points of power in an abstract construction of control.³²⁷ This was particularly true for the surveyors, who interacted with the landscape to understand what it looked like only to quantify and bind it in points connected by imaginary lines.

³²⁴ Tilley (2012), 16-18, Kowalski (2012), 87, 90-93, 97; Thiering (2014), 288-291.

³²⁵ Geus (2014b), 147-150; Thiering (2014), 287-288.

³²⁶ Ingold (2007), 75-79; Tilley (2012), 17-18.

³²⁷ Ingold (2007), 81.

2.6 To Walk Like a Madman: Observation, Movement and Landscape Information

In the Roman world, people, while walking, adopted specific bodily postures, whose character and perception was mediated by the landscape, weather and social conditions.³²⁸ The way in which one walked and where one did it established gender, social position and occupation to a far greater extent than in modern societies.³²⁹ Cassiodorus, whose account opened this chapter, made a clear connection between movement, observation and the surveyor's craft when he observed that one might consider surveyors to be madmen if one watched them walking the hills in search of evidence.³³⁰ Much the same feeling pervades the writings of the Roman land surveyors, where the way surveyors move and manipulate their instruments are shown to determine their status, the data they can acquire and the viability of the ways in which they chose to shape the landscape.

Regrettably, only two detailed accounts of practical surveying in the field have survived for study. One is in the writings of Frontinus and the other is in the fragments which have tentatively been assigned to Junius Nipsus.³³¹ From the state of the text in the manuscript editions used by Lachmann and all subsequent editors of the *Corpus Agrimensorum*, it would seem that the copyists who produced the first recension had trouble understanding what it was they were reading in the original sources. Beginning with Lachmann, editors have been forced to intervene and amend the text in the manuscript codices extensively.³³² This means that interpretations of the texts inevitably rest on conjecture, which, in the case of Nipsus, has not been fully accepted by the scholarly community.³³³ For Frontinus at least, most editors have accepted Lachmann's emendations, providing a scholarly consensus upon which to proceed.³³⁴

In the section of Frontinus' work entitled the *De arte mensoria*, the author describes a theoretical approach for resolving practical problems when setting out

³²⁸ Tilley (2012), 16-17, 22.

³²⁹ Coulston (2004), 142, 151; O'Sullivan (2011), 16-28; Tilley (2012), 19-22.

³³⁰ Cassiod. *Var.* 3.52.8.

³³¹ Bouma (1994), 15-18.

³³² Bouma (1994), 9-14, 19; Campbell (2000), *Introduction*, XXI-XXVII.

³³³ Dilke (1974a), 219-225; Bouma (1994); Bohlin (2013), 15-16.

³³⁴ Campbell (2000), 231; Guillaumin (2005), 163.

boundaries in irregular terrain or at the outer edge of centuriated land.³³⁵ The exercise depends on the surveyor geometrically aligning a series of right-angled triangles formed from points, which were marked by surveyors' stakes in the course of field walking. Abbreviated, the passage reads:

The foundation for the practice of the art of surveying rests in practical experience. The truth of sites or extent cannot be expressed without rational lines, since the perimeter of all land is enclosed by a curving and uneven boundary, which through a multitude of angles of varying size can be expanded and contracted even as the total number of angles remains the same. ... Therefore, we should seriously consider how the *ferramentum* might be used so that we can surmount whatever obstacle might oppose us. Then we should demonstrate the greatest diligence in the taking of measurements, particularly in the progress of the course which will coordinate the execution of the determination with the lengths of the sides. First use the *ferramentum* and when it has been balanced carefully, align all of the movements. With the eye, sight from all of the projecting arms (of the *ferramentum*) across the threads or strings once they have been made taught with weights and aligned with one another, until one sees the nearest alone, while the other disappears from the field of view. Then report the marks and retrieve them, having in the interval transferred the *ferramentum* from the furthest marker, and keeping it in the same position as it was before, continue the straight line that was begun until it comes to a turn or to the end. At all turnings, let the plumb-line (at the end of the *ferramentum*'s arm) indicate the point of intersection. ... Now, if there is a valley, which is too wide for surveyors to see across, one must go down through it using markers fixed in accordance with the *ferramentum*. ... On the other hand, in the case of a narrower valley, the other side of which one can sight, take steps for the avoidance of trouble thus: cross to the other side and report at least three points, from which, once they have been recovered after the *ferramentum* has been transported across, one must back-sight to the markers fixed previously (on the other side) and, with it (the *ferramentum*) balanced carefully, continue the straight line which has been begun until the matter is concluded.³³⁶

Here, Frontinus expresses the conviction that surveying was essentially a performative exercise that could not really be learned from books, because it involved extracting an orderly mathematical understanding from a landscape, which was inherently comprised of rough ground and the uneven boundaries created by mountains, rivers, swamps and forests.³³⁷ In order to create an orderly structure that people could comprehend on a more abstract level, surveyors had to experience the topographical

³³⁵ Campbell (2000), 327-332.

³³⁶ Front. *De Art. Mens.* 2000.12.16-29 = 2005.4.2; 2000.14.5-15 = 2005.4.5-6.

³³⁷ Front. *De Agr. Qual.* 2000.4.19-23 = 2005.2.4; *De Art. Mens.* 2000.12.16-20 = 2005.4.2.

irregularities of a region to visually identify the beginning of a survey and its significant topographical points.³³⁸ This could fairly be said to reflect wayfaring. However, once a starting point was identified, the surveyor would balance the *ferramentum* or *groma*, as it was sometimes called, and visually sight an alignment taken on a graduated staff set up at a mark formed from boundary markers or physical features such as boulders, trees, rivers and even man-made structures like walls or aqueducts.³³⁹

While the text quoted above might suggest that this was only done over short distances for the organisation of civic land, evidence discussed more fully in the last chapter of this study shows that sighting could be done between points that were as much as thirty kilometres apart.³⁴⁰ However, whether a surveyor sighted a target near or far, he visually created an abstract line in the landscape derived from the rays projected by the eye discussed in section 2.4 above. Such an abstract line of sight could only be given form when the surveyors, their assistants or apprentices walked its length and measured the distance between nodes using the *decempeda*, measuring cords or fine lengths of chain.³⁴¹ By walking the length between two nodes, the surveyor transformed the abstract line of sight into a path, whose length was quantified as what Ingold would term a connector or a line of transport.³⁴² As a line of connection, the *rigor* exists from the moment the surveyor sights it, marks the two points and calls them to his assistant for inclusion in the documentation of the survey. The quantification of the *rigor* through the measured walk, which transforms it into a connector, allows the surveyor to have power over the line as a boundary in much the same way that Serafina Cuomo and Alice König have demonstrated that numeracy allowed scribes and aqueduct administrators to gain regulatory control over water, grain and other commodities by describing them exactly in quantitative terms.³⁴³

As the inscriptions quoted above illustrate, the measurements defining a boundary were not always cited in legal documentation, since a boundary could function as a means of defining social identity in terms of space without reference to its quantitative description. It was enough for the markers forming the nodal points of the boundary's

³³⁸ Balb. *Ad Cels.* 2000.208.1-3; Hyg. *De Lim.* 2000.136.18-27 = 2005.1.22-25.

³³⁹ Jun. Nips. *Flum. Var.* 45.12-15; Her. *Diopt.* 5; Lewis (2001), 126-132; (2012), 134-135, 143-146.

³⁴⁰ Quilici (2008), 560; Poulter (2009), 4-6, 10.

³⁴¹ App. 1.26; Her. *Diopt.* 21-22; 34; Lewis (2001), 20-21.

³⁴² Ingold (2007), 75, 79.

³⁴³ Compare: Cuomo (2000), 195-196; (2011a), 180-183; König (2007), 186-190.

course to be recognised by the respective parties on either side of the line and the imperial administrators responsible for enforcing order. The quantitative value was only important when the structural integrity of the boundary was under threat and the presiding magistrate needed to demonstrate exact control over the boundaries.

An illustrative example of this principle comes from the text of the *decretum* issued by Titus Flavius Monomitos, surveyor and judge in a dispute between *Lakedaimon* and *Messene*, issued sometime between the 15th and 31st of December 78 AD. Monomitos, an imperial freedman and surveyor, marked out the line of what was reported to be an ancestral boundary snaking its way across the mountainous topography from one inscribed marker to another, in order to resolve a dispute over the exact location and extent of the boundary between the two communities in what was probably an on-going battle for control over the Temple of *Artemis Lemnatis* (Figs. 2.4 and 2.5).³⁴⁴ The markers he established formed a natural monument of order and power out of the mountainside that could be experienced as a living expression of the Greek collective memory, which could be mathematically described and mapped.³⁴⁵ Monomitos presented the distances for this boundary as a list of precise measurements between individual markers to illustrate his detailed knowledge of the boundary's relationship to the landscape and its structural integrity. In so doing, he asserted full control over the boundary to forestall any chicanery on the part of either group, in much the same way that Frontinus' presentation of exact pipe-sizes allowed him to obtain control over the flow of water from the aqueducts, putting a stop to water-fraud at Rome.³⁴⁶

2.7 A Law of Numbers and a Number of Laws: Mathematics and the Surveyors' Juridical Taxonomy of Boundaries

Establishing a boundary for the first time in an inhabited landscape or recreating one, as Monomitos did, entailed engagement with different social constructions of landscape and the epistemological systems people used for creating it out in the provinces.

³⁴⁴ App. 2.7; IG 5.1.1371a-c; Tac. *Ann.* 4.43; Paus. 4.1.1; 4.4.2; Elliott (2004), 75-77; Koursoumis (2014), 213-216.

³⁴⁵ Alcock (2001), 324-327; Acolat (2005), 34-38; Koursoumis (2014), 216-218.

³⁴⁶ Front. *De Aqu. Urb.* 9; 31; 64; 77; König (2007), 187-189.

Obtaining the necessary authority to shape or reshape those social constructions meant appropriating and syncretising local systems for constructing land as place with Roman approaches. While not all groups in the Roman world quantified the land they owned, in order to structure it as a place of habitation, the majority seem to have done so in one way or another. As several passages of the *Corpus Agrimensorum* show, numeracy, as an expression of material objects such as the number of cattle a person owned or the amount of land occupied, was a common social convention in many places and there were many different quantitative systems used throughout the Empire.³⁴⁷ While most of those systems of calculation were doubtless based on measurements taken from the human body, adapting those units or expressing Roman calculations for an area of land in them forced surveyors to be far more conversant in what Quintilian referred to as numerical calculation and the proofs for figures.³⁴⁸ More importantly, they had to be able to work with both systems simultaneously before an audience who might or might not understand what it was that the surveyors were doing.

For most intellectuals, numerical calculations and geometric proofs for figures with their labelled diagrams were treated as two distinctly separate branches of theoretical mathematics. This was also evident for Quintilian, who thought in terms of the mathematical tradition founded by Aristotle, Euclid and Archimedes. However, in a movement crucial for the surveyors' intellectual coalescence, scholars in the Hellenistic Period developed an intellectual framework that integrated numerical calculations into the proofs for figures as a complete system for the production of geometric demonstrations used to resolve practical problems on a theoretical level. The best surviving example of this mathematical tradition are the writings of Hero of Alexandria.

Recently, Karin Tybjerg has explored Hero's philosophical project of adapting the work of Euclid and Archimedes to the needs of practical mathematics.³⁴⁹ Anchoring himself firmly in the tradition linking the development of geometry to the division and organisation of land, Hero explored the purely abstract mathematics of Archimedes and

³⁴⁷ Front. *De Lim.* 2000.10.12-23 = 2005.3.8-9; Hyg. *De Cond. Agr.* 2000.88.22-90.12 = 2010.2.50-55; Campbell (2000), 365, no. 30; Guillaumin (2010), 96-97; Cuomo (2013), 257-258.

³⁴⁸ Quint. *Inst.* 1.10.35-45.

³⁴⁹ Tybjerg (2004), 36-39.

gradually included numeric computations as a part of the geometric proofs.³⁵⁰ As he developed his arguments, Hero gradually withdrew the Euclidian proofs with purely abstract lettered diagrams in favour of proofs supported by diagrams constructed around mechanical instruments, such as the sliding ruler and dioptra (Fig. 2.6) used to solve real-world problems.³⁵¹

This insistence for what Thomas Heath has called alternative proofs for Archimedes' mathematics, as well as an encyclopaedic interest in land division and mechanics, has led scholars to consider Hero a practical author focused on utility rather than a complete understanding of theoretical mathematics.³⁵² But this straightforward reading obscures a deeper philosophical agenda permeating Hero's writings, which have only recently been explicated by Serafina Cuomo, Karin Tybjerg and Courtney Roby.³⁵³ Hero used a complete understanding of Euclidian mathematics to blur notions of geometrical and physical space, mechanical and geometrical objects, practical and theoretical concerns. He intellectualised the disciplines of mechanics and surveying to make the moral and philosophical claim that advancements in mathematics, when applied to human problems could bring order, justice and tranquillity to a troubled world.

Drawing on the argument that there are similarities between the writings of Hero, Frontinus and Balbus, and that Hero's work predates that of the *Corpus Agrimensorum*, Jean-Yves Guillaumin, Gerard Chouquer and Courtney Roby have argued that Hero's scholarship deeply influenced the theoretical development of Roman surveying.³⁵⁴ Guillaumin and Roby are unquestionably correct to point out that Roman surveyors, like Hero, integrated visual observations, instrumentation and Greek mathematical theory to discuss the organisation of land as part of a wider philosophical discourse, even as they adapted those numerical and geometric concepts to fit the organisation of land through a

³⁵⁰ Herod. *Hist.* 2.109; 4.36; 5.49; 5.52-54; Aristot. *Meteor.* 2.5 362b12; Aristoph. *Neph.* 200-217; *Lysist.* 1156-1180; Str. *Geog.* 17.3.1; Her. *Metr.* 2.3-5; 92.7-13; 140.3-142.1; *Dioptr.* 11-21; Tybjerg (2004), 31-34.

³⁵¹ Tybjerg (2004), 41-48.

³⁵² Heath (1921), 307, 311-314, 317-322.

³⁵³ Cuomo (2002), 174-176; Tybjerg (2004), 46-48; Roby (2014), 16-17.

³⁵⁴ Guillaumin (1992), 205-214; Chouquer and Favory (2001), 20; Roby (2014), 16-17, 26-28, 33, 38-39, 42-43.

variety of different quantitative systems.³⁵⁵ Yet such similarities do not in and of themselves prove that Hero was the primary source of inspiration for the authors in the *Corpus Agrimensorum*. Recently, Ramon Masia has shown that the text of the passage of the *dioptra* describing a lunar eclipse used to date Hero's life is both corrupted in the original manuscript, and that the language of the passage fits a hypothetical mathematical demonstration rather than a historical narrative.³⁵⁶ As a demonstration, the description of the eclipse, like Hero's discussion of a hyperbolic harbour, should be read more as an assertion about what surveyors can do when they apply theoretical thinking to transpose reality and the abstract plain of pure geometry than as a report about any real world event.³⁵⁷ In light of this, scholars cannot use Hero's text to date the period in which the scholar wrote, since it formed part of a rhetorical discourse. It is more than likely that the similarities in subject matter and rhetorical strategy scholars have found in Hero, Frontinus and Balbus reflect intellectual discourse between a group of near contemporaries who all drew on the same Hellenistic texts and traditions.³⁵⁸

While surveyors and scholars such as Balbus and Hero doubtless conducted this intellectual discourse as part of cultural and intellectual rivalry, the authors in the *Corpus Agrimensorum*, unlike Hero of Alexandria, focused more on how people could inhabit the landscape than on the mechanics of organising the landscape itself. They also assumed that their audience understood the fundamental relationship between observation, instrumentation and the integration of numerical and geometric theorems for the organisation of land as property. Only Balbus, in his manual on the elements of surveying, provides a detailed explanation of the mathematical taxonomy of boundaries used to accomplish the task:

Each observation of measurements begins and ends with a point. A point is something which cannot be divided. This is significant to the investigation of all perimeters. Indeed, a point without division is the starting-point from which all things begin. A perimeter is the point up to which an individual's right of possession is granted, or the point up to which each person maintains their own (property). There are two kinds of perimeter, one which

³⁵⁵ Her. *Metr.* 2.3; Front. *De Art. Mens.* 2000.12.3-29 = 2005.4.1-2; Hyg. *Const. Lim.* 2000.150.27-152.14 = 2005.11.4-11; Hyg. *De Cond. Agr.* 2000.90.1-12 = 2010.2.53-55; Dilke (1971), 22-30; Lewis (2001), 13-16.

³⁵⁶ Masia (2015), 240-245.

³⁵⁷ Her. *Diop.* 17; 22; 35; Roby (2014), 16-17, 38-39; Masia (2015), 243-245.

³⁵⁸ Her. *Diop.* 9-13; 22; 33; Balb. *Ad Cels.* 2000.204.18-32; 2000.208.1-210.14; Front. *De Art. Mens.* 2000.12.3-14.11 = 2005.4.1-5; Lewis (2001), 126.

is recognised by means of a straight-line boundary [*rigor*], the other by means of an irregular one [*flexus*]. A straight-line boundary [*rigor*] is whatever is observed to extend between two points as if it were a perfectly straight line; an irregular boundary [*flexus*] (is recognised) when anything curves to follow the nature of the terrain, as is customary in arcifinial land [*ager arcifinius*]. The *decumanus* is a calculated length, as is the *cardo*, when two straight boundary lines [*rigores*] have been constituted into a single (boundary), with the space for a roadway coming in between the individual (boundaries). Whatever occurs out in the field through the need for measurement in order to produce a straight boundary [*finis rectus*], is called a straight-line boundary [*rigor*]. Whatever is drawn to reproduce these (boundaries) on a map [*forma*] is referred to as a line [*linea*].³⁵⁹

The translation presented here is intended to highlight the intellectual distinctions Balbus was making, which simultaneously blended the Euclidian definitions of a point and line with the Peripatetic understanding of a place as the space contained within set perimeters, defined by the place's relationship to other physical elements.³⁶⁰ A key component of his taxonomic explanation was that the line started from a prime point or *locus gromae*, and visually connected points to form the perimeter.³⁶¹ The perimeter marked out on the ground and the abstract line drawn on a map to represent that line of sight were two physical and intellectual elements, which were quite distinct and separate from the line of sight that gave rise to them. A boundary was marked by physical objects that could be investigated, but those objects only formed the boundary line when a surveyor sighted a line or what Balbus termed a *rigor* between them out in the field.

This reflects the distinction between the act of transformation that initially established markers and the act of recovery, which re-established markers as forming a boundary, as was outlined above. The line drawn on the map by contrast, as a drawn length without breadth between two points, whether straight, circular or curving, was a symbolic mediator between the abstract ideal of what space should be like and the reality on the ground.

³⁵⁹ Balb. *Ad Cels.* 2000.208.1-13.

³⁶⁰ Euc. 1.2; 2.1; Aristot. *Phys.* 4.4-5.

³⁶¹ Compare: Her. *Diopt.* 7-10; Front. *De Art. Mens.* 2000.12.3-29 = 2005.4.1-2; Jun. Nips. *Flum. Var.* 45.5-46.20; Hyg. *Const. Lim.* 2000.150.22-152.14 = 2005.11.1-11; *De Munit. Cast.* 12; Balb. *Ad Cels.* 2000.204.21-23.

As Courtney Roby has observed, the mathematical principles of the line as Balbus explains it, allowed the surveyors to mentally shift a set of objects which began as points in the landscape, pinned to predetermined lines of sight, back and forth between the physical landscape and an intellectual abstraction of it, formed within a mathematical framework.³⁶² Doing so allowed surveyors to render real-world objects describable and therefore knowable and controllable on a metaphysical level found in surveyors' maps and *commentaria*.³⁶³

While Guillaumin has suggested that much of the contents of the work written by Balbus was derived directly from the writings of Euclid or Hero of Alexandria, problems in the transmission of the text make direct attributions difficult.³⁶⁴ There are grounds for believing that Balbus was not simply translating the mathematical concepts of these authors into Latin, however, but rather, like Vitruvius, was engaged in an enterprise to adapt, develop and explain the application of Greek theory for surveyors on both an intellectual and practical basis.³⁶⁵ First, at the end of his introduction, Balbus states that he was granted a one-year leave from the legions by the emperor to write a book on surveying procedures and that he had gathered up his notes to incorporate fresh ideas into the canon of the surveyor's craft.³⁶⁶ This shows that there were core procedural practices that all surveyors were expected to master and the writings of Aristotle, Euclid, Eratosthenes, Archimedes and Hero are all likely candidates for Greek authors included as part of that canonical learning.³⁶⁷

More importantly, Balbus groups a number of Euclidian definitions together into discrete periods, whose final thought is demonstrated with real-world examples, which frequently reflect the problems faced by surveyors out in the field. In addition, the earliest version of Balbus' work, preserved in the manuscript held at the Herzog August Bibliothek, also contains illustrations that were embedded in the text in a manner that suggests that they were intended as a functional part of the discussion rather than

³⁶² Roby (2014), 13-14, 24.

³⁶³ Front. *De Agr. Qual.* 2000.2.12-17 = 2005.1.3; Hyg. *De Cond. Agr.* 2000.84.23-33 = 2010.2.31-33; 2000.88.10-21 = 2010.2.48-49; Dilke (1974b), 578-580; Moatti (1993), 50-55; Bonnie (2009), 35; Leveau (2010), 57-62.

³⁶⁴ Guillaumin (1992), 5-8, 14-15; (1996), 3, 14, 39, no. 31.

³⁶⁵ Guillaumin (1996), 3, 14, 39, no. 31; Wallace-Hadrill (2008), 146-152.

³⁶⁶ Balb. *Ad Cels.* 2000.202.29-32.

³⁶⁷ Guillaumin (2005), 200, no. 188; Roller (2010), 12, 270; Bohlin (2013), 6, 13-15; Roby (2014), 21, 34, 36-37.

decoration. Reviel Netz has argued that the diagram is not a representation of something else; it is the thing itself. It is not like a representation of a building, it is like a building, acted upon and constructed.³⁶⁸ Karin Tybjerg and Steffen Bogen have adapted Netz's argument in their assessment of the diagrams in Hero of Alexandria's work. They argue that Hero and perhaps other Hellenistic thinkers drew on the work of Aristotle to adapt the lettered diagram to reflect instrumentation, which blurred the boundary between the manipulation of purely mathematical objects presented in a text, and mechanical objects grounded in the real world through the imagination of the reader.³⁶⁹

Michael Squire, in a detailed examination of the paintings in the 'House of Propertius' at Assisi, has also emphasised the role of imagination in unveiling the multi-valenced readings for literary texts embedded alongside images and the interdependence which existed between the two.³⁷⁰ All of this suggests that the late antique scribes, who produced the text of Balbus, intended the reader to use the figures as a vehicle for imagining how the geometric principles discussed could be introduced into the landscape and the ways in which features of the landscape could be represented in diagrams.

The interplay between Euclidian theorem, graphical depiction and physical action in the discursive strategies employed by surveyors comes through in the three sections of Balbus' text, immediately following the passage quoted above. In the first of these sections, Balbus explains the difference between the straight line, the circular line and the irregular or curving line. The first stretches between two points, the second cannot be sighted easily, since its path takes it out of the line of sight and the irregular line is described as being like a river, a mountain chain or the boundary for *ager arcifinius*.³⁷¹ The text is interspersed with two diagrams. The first illustrates the straight, circular and irregular lines as pure geometric objects (Fig. 2.7), while the second illustrates the nature of the curving or irregular line, as he describes it in the text as being the edge of an irregular field, a winding river flowing past a cylindrical tower and a mountain chain (Fig. 2.8). The field illustrates the interplay between the straight and irregular line, while the river shows the interplay of the irregular line of the river

³⁶⁸ Netz (1999), 60.

³⁶⁹ Tybjerg (2004), 29, 42-43; Bogen (2013), 280, 288-295.

³⁷⁰ Squire (2009), 247-264.

³⁷¹ Balb. *Ad Cels.* 2000.208.13-20.

moving past the circular form of the tower. The mountains reflect an object represented by the irregular line alone. Individually, neither the text nor the diagrams convey the concept that one was expected to conceptualise the Euclidian definitions as lines in a document or that those lines should be applied to features in the landscape, which could and would need to be represented using mathematics in a document. The transposition of mathematical objects and real world features into the representational plain of the document only comes when the diagram and text are considered together.

Balbus and his scribal copyist continued the exercise in two more surviving sections. Next Balbus explained the nature of a surface in a passage whose interpretation has been disputed by Guillaumin and Campbell:³⁷²

The surface, according to geometric terminology, is something which has only length and breadth. Lines (form) the boundaries of a surface. A level surface is one which has been laid out uniformly with straight lines. Moreover, there are two ways of sighting the measurements of all surfaces: *enormis* and *liquis*. An *enormis* (surface) is one which is contained within right angles around the whole field. A *liquis* (surface) is one which, for the sake of reducing the labour involved and to maintain the principle of right angles, is subtended according to the (shape) of the perimeter itself.³⁷³

Guillaumin has argued that the term *observationes*, which has been translated as ‘sighting’ here, should be considered a Latin term reflecting a *genus* of measurement, while *contemplatio* was used to render *theorema* or *theorum*.³⁷⁴ Campbell rejected the notion out of hand without providing an explanation in his commentary.³⁷⁵ Such a perfunctory dismissal of scholarship done by Guillaumin, who is one of the leading authorities on the *Corpus Agrimensorum*, is unusual for Campbell, though his commentary on Balbus is much less comprehensive than those done for other authors. Guillaumin based his interpretation upon the use of mathematical terminology, the structure of the text following the explanation of points and lines, and above all the conviction that Balbus adapted his mathematical materials directly from Euclid and Hero of Alexandria.³⁷⁶ While this suggestion does great credit to Guillaumin’s philological genius, there do seem to be reasons to question it.

³⁷² Roby (2014), 41-43.

³⁷³ Balb. *Ad Cels.* 2000.208.13-21-26.

³⁷⁴ Guillaumin (1996), 39, nos. 31, 47 no. 45, 51 nos. 50-51.

³⁷⁵ Campbell (2000), 433, no. 8.

³⁷⁶ Guillaumin (1992), 8-14.

First, Balbus uses the terms *genus* and *species* in their geometrical sense only a few lines later to categorise several types of angle.³⁷⁷ Second, ascribing a spatial meaning to observations here may be possible, but it would be unique and unparalleled by any of the other uses of the word in Balbus or any of the authors in the *Corpus Agrimensorum*. Third, as has already been mentioned, Balbus stated that he intended to discuss the development of practical applications for theoretical concepts in his introduction, which would make his agenda quite different from Euclid or Hero. As a consequence, one should be wary of trying to see too close a parallel between Balbus and his Greek originals. Fourth, the vocabulary of the passage itself is full of subtle references to the active pursuit of measurement in the field, which include: a) *observationes* as a term for sighting the limits of a surface; b) *actus*, which usually means a subdivision of a survey, a field or a right of way for cattle, as the term used for the area of a surface; c) *labor* as the term for the effort in constructing the area of the surface itself. Such vocabulary reflects an actual surveying operation mediated by mathematical formulas rather than a purely abstract formation of geometric figures.

The illustrations for this section, which are crucial for understanding what it was that Balbus was describing, are an interesting contrast to the active language of the passage. The illustration (Fig. 2.9) shows two geometric figures. One of the figures illustrates what seems to be a rectangle with an intrusion at one side, representing a field laid out with four nearly equal sides with right angles. The other figure (Fig. 2.10) shows an abstract square with a jagged edge at the bottom, where it would be impossible to form right angles. The first shape was presumably intended to reflect an enormous field while the other was *liquis*. The combination of language and image should probably be taken as a reflection of the fusion between abstract principles and concrete reality, which was the focus of Balbus' exposition rather than as direct proof for Guillaumin's interpretation.

The full import of the surveyors' use of mathematics to structure land in this fashion comes out in one final passage of Balbus, which forms the *terminus* to his discussion of angles. Balbus, having detailed all the Euclidian categories for angles,

³⁷⁷ Balb. *Ad Cels.* 2000.208.27-30.

their relationship to one another, and the ways one can form angles from circles and curves, observes:

Still, all those irregularities in shape can be enclosed and divided up with measured lines. For example, a line with many curves can be brought under measurement, to the extent which the nature of the site itself allows, by which it most nearly approximates a straight line or the circumference of a circle, if the boundary is recognised by boundary markers, marked trees, or ditches, or roads, or by mountain ridges and watersheds.³⁷⁸

While Balbus does not provide the details for the system of geometric approximation he mentions, David Romano has shown how the cadastral grid, formed from shallow furrows or trenches, was able to follow the curving shore-line of the Corinthian Gulf using a system of right triangles to create offsets.³⁷⁹ Romano's reproduction of the street-grid found in Roman Corinth (Figs. 2.11 and 2.12) alongside the text of Balbus prove that the surveyors used geometric principles to adapt straight lines of sighting to the shape of land on both a theoretical and practical level. The full implications of this for Roman systems of land management will be considered below, but it is important to recognise that the surveyors brought geometric principles to the organisation of any topographical formation found in the landscape.³⁸⁰

Mathematics was a quantitative method of mentally structuring the perimeter of land to transform it into a place circumscribed by topographical markers connected by lines of sight. The markers, and lines of sight connecting them, intellectually enclosed an area of land much as the sea encloses and defines the shape and structure of an island.³⁸¹ However, where the island was separated from other portions of land by the water, a section of land defined by the abstract lines of sight (or *rigores* to use Balbus' term), could touch, overlap or even enclose other portions of land. In order to restore the 'truth' of a place, to use Frontinus' phrasing, a surveyor had to define a place taxonomically in quantitative and qualitative terms.³⁸² It was not enough for the surveyors to describe the length of the boundaries, their nature and the geometric shape

³⁷⁸ Balb. *Ad Cels.* 2000.210.25-29.

³⁷⁹ Front. *De Art. Mens.* 2000.12.3-29 = 2005.4.1-2; Romano (2006), 73-74.

³⁸⁰ Hyg. *De Cond. Agr.* 2000.82.1-9 = 2010.2.17-18, translation by Campbell.

³⁸¹ Quint. *Inst.* 1.10.40; Str. *Geog.* 1.1.21; 2.1.30; 2.5.11; 2.5.22-27; 6.2.1-11; Kowalski (2012), 150-157.

³⁸² Aristot. *Cat.* 5A-6E; Front. *De Art. Mens.* 2000.12.3-5 = 2005.4.1; Agen. *Urb. De Contr. Agr.* 2000.32.30-35; Cuomo (2007), 112; Vinci (2008), 10-11, 14-16.

they formed. They also had to define the qualities of a site by establishing the title to the place by identifying the lawful owners by name.³⁸³

This was true whether the surveyor was dealing with an individual *fundus* or the territory of an entire community. Indeed, each *fundus*, whose boundaries were defined in this way, was attached to a community. It in turn had its own outer boundaries defined and those outer boundaries touched upon the boundaries of other communities, which merged together to form a region or a province, defined by boundaries and the pathways that connected settlements to one another.³⁸⁴

2.8 The Law of Numbers and a Number of Laws: *Agrimensores*, Jurists and the Taxonomy of Land

While the geometric principles discussed here may seem like academic abstractions, they were grounded in material lines, which were formed by both looking at and – more importantly – walking in the landscape. The geometric descriptions of land as a place and the over-lapping legal taxonomy of land-ownership in the Roman world formed the intersection between the lived experience of those who inhabited the landscape and the administrative norms of the imperial magistrates, who were responsible for tax-collection and the enforcement of the law. As inscriptions considered in the next chapter will show, most land-holders were predominantly concerned with the physical marking of boundaries and the control of property under local law, but Roman administrators were concerned with the documentation and the qualitative justification for ownership used to regulate relationships between people.³⁸⁵ This meant that the surveyors had to engage with Roman juridical thinking, both in the formation of boundaries and in the resolution of disputes that arose from the formal organisation of land.

As the passages from Balbus indicate, the surveyors all grouped land into unsurveyed *ager arcifinius* and surveyed land, which was classified by Frontinus as either

³⁸³ Cavalieri Manasse (2000), 5, 28; Chouquer and Favory (2001), 45, 56-58; Tarpin (2002), 193, 195-196; Campbell (2005), 313-314; Maganzani (2007), 7-9.

³⁸⁴ Ulp. *Dig.* 16.21.1, 21.11.1, 50.15.4, 50.16.6; Hyg. *De Cond. Agr.* 2000.78.21-32 = 2010.2.1-2; Crawford (2003a), 208-210; Chouquer (2010), 90-96; Reis Martines and Carvalho (2010), 290-293.

³⁸⁵ Kehoe (2007), 56-58, 94-95, 104-105, 109, 119; Chouquer (2007), 18, 20, 23-25; (2010), 110, 119-125, 138-139; Mattingly (2011), 147-152; Dubouloz (2012), 79-82, 99-101, 104-105, 118-122.

ager adsignatus or *ager divisus et adsignatus*.³⁸⁶ The distinction between categories of surveyed land was largely political, based on the level of internal intervention, involving geometric construction: *ager adsignatus* was enclosed by an outer boundary but its internal division into regular geometric blocks only existed on paper if at all, while *ager divisus et adsignatus* was always formally divided into square units by a grid of *limites* marked out on the ground.³⁸⁷

Ager arcifinius was land occupied by individual claimants without a formal survey. Since its extent was defined through topographical features, which were not always quantitatively defined, any maps or documents drafted by the occupants as a means of establishing the extent of a holding and ownership of the place were not binding under the *ius civilis*, though rights of occupation presumably held sway under the *ius gentium*.³⁸⁸ This meant that in the event of litigation, surveyors were not automatically involved and the extent of their involvement would have been determined by the nature of the case.

This also meant that surveyors had to classify disputes from the individual qualities and characteristics presented in description of the dispute found in the *litis contestatio* worked out by the presiding magistrate.³⁸⁹ A surveyor, as Frontinus and the author of the *De Generibus Controversiarum* explained, normally only investigated cases involving: the deposition and erosion of land by rivers, boundaries or boundary markers, site, area, the law relating to *subseciva* and territorial jurisdiction. However, they could also be called in to deal with problems involving ownership, possession, the character of public or sacred and religious places, the control of rain water and rights of way.³⁹⁰ The involvement of a surveyor in each of these types of litigation depended upon the existence of a boundary-line, the physical location of a given place within a site defined by boundaries or the extent of a given section of land.³⁹¹ There were many

³⁸⁶ Front. *De Agr. Qual.* 2000.2.2-5 = 2005.1.1; Campbell (2005); (2006); Chouquer (2007), 14; Maganzani (2007), 6-8.

³⁸⁷ Front. *De Agr. Qual.* 2000.2.5-17 = 2005.1.2-3; Piganiol (1962), 30-32, 54-55; Burton (2001), 203-206; Ando (2011a), 40-42; (2012b), 113, 118; Dubouloz (2012), 87-98.

³⁸⁸ Front. *De Agr. Qual.* 2000.2.3-23 = 2005.1.1-4; *De Contr.* 2000.8.12-17 = 2005.2.16; Agen. Urb. *De Contr. Agr.* 2000.28.16-20; 2000.28.31-36; 2000.30.13-21; Hyg. *De Cond. Agr.* 2000.82.15-22 = 2010.2.21-22; Sic. Flac. *De Cond. Agr.* 2000.104.21-33 = 2010.2.1-2; Guillaumin (2010), 8, nos. 1, 4, 16; 36, no. 6; Chouquer (2010), 138-139; Ando (2011b), 36, 92.

³⁸⁹ Metzger (2010), 30-35; Neudecker (2010), 1643-165.

³⁹⁰ Hyg. *De Gen. Contr.* 2000.90.15-17 = 2010.3.1; Front. *De Contr. Agr.* 2000.4.4-10 = 2005.2.1.

³⁹¹ Campbell (2005), 314-320.

instances, however, where a legal dispute would normally come under the surveyor's proper sphere of activity, but in which the surveyor could not take any action because of legal or administrative considerations. For example, surveyors usually investigated disputes over property resulting from erosion in fluvial land, but where the dispute involved *ager arcifinius* or *occupatorius*, as it was sometimes called, the surveyor could not act since the extent of the site was not documented on a legally-binding *forma* or map.³⁹² Thus, in each case, the surveyor's actions were entirely determined by the existence of boundaries and the classification of the site.

Both the classification of a site and the formation of boundaries were governed by a number of legal conventions, and the authors of the *Corpus Agrimensorum* cite a number of *leges* or imperial *edicta* to explain specific surveying procedures or to establish their position within the wider imperial social hierarchy. What is perhaps most remarkable about the surveyors' use of jurisprudence is the close relationship that they created between it and what has been termed the law of numbers discussed above. The most pronounced example of the practice comes from the *De Controversis Agrorum* of Agennius Urbicus. In passages which echo the spirit of Balbus, Urbicus praises geometry first as the discipline which reveals the size and nature of the universe and then as the mother-lode of rational inquiry, orderly thought and natural philosophy.³⁹³ Then, he explains that all disputes could be resolved either through surveying or through different branches of the law, and introduced a legal proposition couched in terms of geometry:

A rather complicated discussion is called for with reference to a boundary, which in no way differs from a *rigor* except in appearance. We must discuss them carefully, for whenever we speak of a boundary or a *rigor*, no trifling enquiry begins, whether we should recognise one or more lines, or whether the *Lex Mamilia* may not prescribe a width for the boundary. Legal experts are still discussing this law and are unable to explain properly the meaning of the archaic language, that is, whether 10 feet of width should be allocated (on either side of a central line), or five feet only. These people, however, think that five feet constitutes the (total) width, so that each piece of land allows the boundary to stretch to a width of two and a half feet.³⁹⁴

³⁹² Hyg. *De Gen. Contr.* 2000.90.18-22 = 2010.3.2; Sic. Flac. *De Cond. Agr.* 2000.104.29-33 = 2010.2.2.

³⁹³ Agen. Urb. *De Contr. Agr.* 2000.20.13-15; 2000.22.4-9.

³⁹⁴ Agen. Urb. *De Contr. Agr.* 2000.22.31-24.4.

Here, Urbicus sets out the proposition that the surveyors' ability to establish boundaries hinged on the jurists' interpretation of what a boundary should be under the terms of the *Lex Mamilia*, which stipulated that a right of way at least five feet wide be maintained between two or more adjacent properties.³⁹⁵ The question at issue was whether there should be five feet on either side of a *rigor* as a line of site without substance, creating a gap of ten feet formed from three *rigores*, or should a gap of five feet be left between two *rigores*, forming a right of way after the fashion of Balbus' *kardo* and *decumanus*. Most of the jurists and surveyors felt that the law called for a five-foot gap between two *rigores*, which could not be appropriated by right of occupation, whether a site was defined as *adsignatus* or *arcifinius*, as is shown by Urbicus and the passage of Hyginus quoted above in Section 2.4 describing methods for recognising a boundary.³⁹⁶ Thus, at least in theory, every *fundus* or estate was surrounded, bounded and stitched into the fabric of the landscape by a series of pathways whose existence could not be alienated.

However, not all rights of way in the Empire were created equal, nor were they constructed in the same way. The author of the *De Limitibus*, attributed to Hyginus, provides the information that a further piece of legislation, which may have been introduced by Augustus, stipulated that a colonial founder could establish any width for the *cardo* and *decumanus maximus* so long as they were at least twelve feet wide, but all other *limites* of a colony had to be more than eight feet wide.³⁹⁷ The same legislation also seems to have stipulated that the *quintarius* or every sixth *limes* in a colonial *pertica* be wider than the others and yet narrower than the *decumanus maximus*.³⁹⁸ Like the generic right-of-way between holdings, discussed by Agennius Urbicus, Roman law further stipulated that the *limites* through a colony be kept clear even if it meant providing a detour through a field or keeping slaves on duty day and night to open doors, so that travellers could pass through a building constructed across one.³⁹⁹

While the jurists were concerned with access to rights of way, they did not use the

³⁹⁵ Cic. *De Leg.* 1.55; Callist. *Dig.* 47.21.3.Pr; Front. *De Contr.* 2000.4.16-18 = 2005.2.3; Agen. Urb. *De Contr. Agr.* 2000.30.14-21; Hyg. *Const. Lim.* 2000.136.6-9 = 2005.1.19; Campbell (2000), 321, no. 11.

³⁹⁶ Front. *De Contr.* 2000.4.19-23 = 2005.2.4; Hyg. *De Gen. Contr.* 2000.92.10-19 = 2010.3.7.

³⁹⁷ Hyg. *De Lim.* 2000.76.1-7 = 2010.1.1; 2000.78.1-4 = 2010.1.9; Moeller (2014), 66-67.

³⁹⁸ Hyg. *De Cond. Agr.* 2000.88.1-6 = 2010.2.45-46.

³⁹⁹ Front. *De Lim.* 2000.8.12-17 = 2005.2.16; Hyg. *De Cond. Agr.* 2000.88.6-10 = 2010.2.47; Sic. Flac. *De Div. et Ass.* 2000.124.32-126.5 = 2010.4.26-28; CIL 3.8663; Wilkes (1974), 265, no. 16.

same terminology and were much less concerned with the physical structure of the path or road than the surveyors. As Alan Kaiser has noted in his book on urban street networks, the jurists never use the terms *decumanus* and *kardo* and the term *limes* appears only once in the *Digest*.⁴⁰⁰ Rather, the jurists drew on the more commonly used vocabulary of agriculture to define rights of way, as places in which people were allowed to undertake specific forms of locomotion, rather than physical spaces defined by a particular set of geometrical or political qualities.⁴⁰¹ An *iter* was an area in which people were granted an easement to walk, but where they were not allowed to drive a beast of burden or a vehicle, while an *actus* was a place where one could walk and drive, but where specific forms of transport or portage were prohibited.⁴⁰² An *aqua ductus* was a specific servitude to draw or transport water, usually across land owned by another party.⁴⁰³ A *via* was the only place where a servitude for walking, driving and unlimited transport, excluding the drawing of water, was granted.⁴⁰⁴

While some of the jurists were interested in the various grades of *via*, which were determined by their physical dimensions and the administrative body responsible for maintenance, it was the surveyor who most frequently applied these categories along with the concepts of transport just outlined. Like the other activities undertaken by the surveyors, these principles were applied either in a recuperative or transformative capacity. In a recuperative capacity surveyors such as Siculus Flaccus measured and assessed both roads and rivers to establish whether the local population treated them as an *iter*, *actus* or *via* used to provide access to property, or if they were considered to be the line of a boundary.⁴⁰⁵ A *via* was either *privata*, *vicinalis*, *pagana* or *publica* with boundaries being set most frequently along the last type of road.⁴⁰⁶

This legislation and the way in which Agennius Urbicus and the author of the *De Limitibus* discuss it introduce two points, which the writings of Balbus quoted above only hint at. First, in defining the pathways for settlement sites, which were formally

⁴⁰⁰ Paul. *Dig.* 18.6.7.1; Kaiser (2011), 24-25.

⁴⁰¹ Kaiser (2011), 27-30; Moeller (2014), 71-74.

⁴⁰² Cels. *Dig.* 8.1.9; Paul. *Dig.* 8.3.7pr; Iacoul. *Dig.* 8.3.13; Moeller (2014), 72-73.

⁴⁰³ Ulp. *Dig.* 8.3.1.

⁴⁰⁴ Ulp. *Dig.* 8.3.1; Iacoul. *Dig.* 8.3.13; Moeller (2014), 73-74.

⁴⁰⁵ Cai. *Dig.* 8.3.8; Hyg. *De Contr. Agr.* 2000.98.37-100.6 = 2010.3.34; Sic. Flac. *De Cond. Agr.* 2000.112.9-11 = 2010.2.26; 2000.112.27-33 = 2010.2.31-32; 2000.116.11-23 = 2010.2.47-51; Moeller (2014), 71-74.

⁴⁰⁶ Sic. Flac. *De Cond. Agr.* 2000.112.12-26 = 2010.2.27-30; Campbell (2012), 100.

adsignatus, the power to define space in quantitative terms was subordinated to and regulated by the jurists and Roman administrators appointed by the emperor. Second, the jurists and surveyors alike defined settlement sites in terms of the paths of movement, which enclosed and connected them. However, the jurists and surveyors present different aspects for the criteria used for assigning a legal status to a piece of land. Jurists and Roman administrators were predominantly concerned with the nature of habitation at a site, its scale and the tax status of the inhabitants. For example, a *fundus* was any farmstead enclosed by boundaries, while a *locus* was either a portion of a *fundus* or else a *fundus* in its own right, depending on how its extent was defined by surveyors. A *vicus* was a dense collection of dwellings in town or country connected by *viae* without being enclosed by its own walls.⁴⁰⁷ The status of the *fundus* or *vicus* would be determined by whether it was administratively speaking attached to a *colonia*, *municipia*, *civitas* or some other form of settlement.

The surveyors, on the other hand were more interested in them as a guide to the history of occupation at a site and the proper structure of the landscape, though they freely used this civic taxonomy.⁴⁰⁸ This interest in the history of land-holding, and the status of the community in which it was held, can clearly be seen in the passages quoted above in section 2.3. In the first of these three passages, Siculus Flaccus discusses the problems introduced by a legal challenge to the territorial boundaries of a *pagus* attached to a *civitas* and the need for an investigation to resolve the dispute, which includes a study of who might be responsible for providing *munera* to the *cursus publicus* and the ways in which sacrifices were performed. For Flaccus, the structure of a territory was defined by the quantitative limits, containing a specific cultural identity which was itself shaped by the history of habitation in a region.

The second and third passages reflect the problems which developed when the pattern of land-holding was disrupted by local land-holders, who bought and sold land in a community, whose territory was *adsignatus* using topographical features rather than in respect of the field systems recorded on the map or in the documentary record. The last reflects discrepancies between physical patterns of land-holding seen in the

⁴⁰⁷ Ulp. *Dig.* 50.16.60; Flor. *Dig.* 50.16.211; Isid. *Etim.* 15.2.12.

⁴⁰⁸ Front. *De Agr. Qual.* 2000.2.5-17 = 2005.1.2-3; Hyg. *De Cond. Agr.* 2000.82.31-32 = 2010.2.25; 2000.84.31-33 = 2010.2.33; Sic. Flac. *De Cond. Agr.* 2000.102.9-104.15 = 2010.1.2-10.

field and the records of settlement found on the maps due to historical circumstances. In all three instances, the surveyors were concerned with individuals' unwillingness to accept the physical dimensions that were assigned to a particular place defined by a legal taxonomic status at a particular moment in time.

2.9 From *Ager* to *Forma*: Mathematics, Law and Place on the Surveyor's Map

While the passages quoted in section 2.3 do not show it, it was on the *forma* or surveyor's map that their interest in the history of land-holding, Roman law and mathematics combined on a fundamental level. The essence of this lies in the observations of Balbus about the relationship between the perimeter, the *rigor* as an abstract line of site and the *linea* or line which was drawn on the *forma* to represent the perimeter, formed in the field by the connection of points using *rigores*. The use of the abstracted straight line of a *rigor* to interpolate the course of a river, forming what Siculus Flaccus terms a *rivus rectus* or proper river boundary, was a transformative act shifting the principles of geometry into the landscape to create a circular, triangular or rectangular pattern of interconnected pathways, which could be perceived in the minds of those who experienced their formation.⁴⁰⁹

The projection of that pattern into a document whose contents was composed of letters, lines and numbers, drawn on the surface of a board or papyrus sheet, however, was a further transformative action shifting points in the real world into the abstract, symbolic plane of the mathematical diagram.⁴¹⁰ For anyone who understood the symbols on the document and the relationship between the figure in the document and its relationship to the structure of landscape, the abstracted diagram would allow him to gain an understanding of the landscape, or at least the relationship between the features marked in the figure without ever really visiting it. More importantly, the figures in the diagram could be inscribed with political meaning and the power of ownership in ways that could only be achieved out in the field through the creation of a monumental inscription, such as the stone markers discussed earlier in this chapter.

⁴⁰⁹ App. 3.6, 4.1, 4.17; Sic. Flac. *De Cond. Agr.* 2000.116.23 = 2010.2.51; Crawford (2003), 207-210; Ingold (2007), 76; Tilley (2012), 17-18; Campbell (2012), 98-100; Roby (2014), 29-30.

⁴¹⁰ Guillaumin (1994), 289-292; Roby (2014), 17, 25.

As a consequence, the *forma* could display features that a surveyor intended to exist in the landscape, but which could only exist on the abstract plane of thought, making it a transformative tool that could not only illustrate how the landscape had been shaped by the surveyors, but also how it should be conceptualised on an ideal level by inhabitants and administrators alike.⁴¹¹ Features of this transformative power will be explored more fully at the ends of Chapters 3 and 4. However, to appreciate how the surveyors brought their skills in mathematics, the discernment of history and the jurists' legal formulations together in this one document, it is worth closing this chapter by looking at the construction of the colonial *pertica* or gridded landscape, where the application of all these features met both on the ground and in the documents.

For the authors of the *Corpus Agrimensorum*, the creation of a colony was a formal ritual act with its own formula, which was overseen by the person appointed by the emperor to establish the new community and at least some representatives from the body of colonists.⁴¹² According to the formula outlined in the *Corpus Agrimensorum*, the colony needed to be oriented so that the main streets of the *decumanus maximus* and *cardo maximus* were extended perpendicularly outward from a single point at the centre of the site through four cardinal gates.⁴¹³ Beyond the walls, the *pomerium* and land set aside for tombs separated the urban fabric from agricultural land, which was divided by *limites*.⁴¹⁴ Where the land claimed for the colony came to an end, a *flexus* would form the outer boundary separating the colonial *pertica* from the territory of other communities.⁴¹⁵

However, surveyors understood that this was an ideal derived from the concept that each colony was expected to develop from a *castra* as an expression of permanent Roman control, which was never realised in practice. Instead, all of the authors in the *Corpus Agrimensorum* stress the need to adapt the layout of a *pertica* to the

⁴¹¹ Guillaumin (1994), 289-292; Acolat (2005); Peterson (2006).

⁴¹² Front. *De Lim.* 2000.8.23-38 = 2005.3.1-4; Hyg. *De Lim.* 2000.78.5-17 = 2010.1.10-11; Hyg. *Const. Lim.* 2000.136.18-21 = 2005.1.22.

⁴¹³ Hyg. *De Const. Agr.* 2000.88.1-6 = 2010.2.45-46; Hyg. *De Const. Lim.* 2000.142.31-36 = 2005.6.6-8; 2000.134.6-14 = 2005.1.3-5; 2000.136.18-27 = 2005.1.22-25; 2000.144.23-146.12 = 2005.7.1-8.2; Front. *De Contr.* 2000.6.7-20 = 2005.2.10.

⁴¹⁴ Var. *RR.* 1.10.2; Aul. Gel. *NA.* 13.14.1; Hyg. *De Const. Lim.* 2000.134.31-136.9 = 2005.1.14-19.

⁴¹⁵ Front. *De Agr. Qual.* 2000.2.23-26 = 2005.1.5; Hyg. *De Cond. Agr.* 2000.82.1-5 = 2010.2.17; Hyg. *Const. Lim.* 2000.142.26-30 = 2005.6.5; Hyg. *Const. Lim.* 2000.144.13-19 = 2005.6.13-15; Sic. Flac. *De Cond. Agr.* 2000.130.23-30 = 2010.4.51-52.

topographical conditions within which it was established.⁴¹⁶ Since not all the sites chosen for colonial foundations could be organised using a grid of *limites*, the creation of a Roman colony always involved both a close dialogue with the landscape and a compromise between what the surveyors wanted to create and what the landscape would allow. This is amply illustrated by the fact that, in situations where none of the land around a site chosen for the colonial urban complex was suitable for the formation of *limites*, additional land for agriculture was allocated in a *praefectura* elsewhere.⁴¹⁷

Roman tradition from the time of Caesar onward called for this land to be organised into centuries, comprised of two hundred *iugera*, each of which contained twenty square *actus* of one hundred and twenty square feet. But the *Corpus Agrimensorum* reports instances where allocations of land were made based on centuries of two hundred and thirty five, three hundred and ten or four hundred *iugera*.⁴¹⁸ Moreover, archaeological investigations have revealed centuries which range from two to sixty six *iugera*.⁴¹⁹ The dynamic range and formation of the landscape reported both in the *Corpus Agrimensorum* and by archaeological investigation using field-walking, aerial reconnaissance, satellite imaging and historical records, show that Roman settlement sites of every size need to be viewed as fragmentary, dynamic historiographical records of on-going human occupation, whose development has been driven by a range of factors.⁴²⁰

While the first Roman colonial field system identified by Captain Falbe in 1833 was visible on the ground through the remains of roads, stone walls and boundary markers, which showed that it was oriented due north using sun and stars, not all Roman field systems are quite so obvious or canonical.⁴²¹ Even at well preserved sites such as Corinth, where David Romano has demonstrated that the surveyors' mathematical precision was as accurate as can be expected without modern computers, Roman grids tended to be oriented well off of true north to take topographical features into

⁴¹⁶ Hyg. *Const. Lim.* 2000.142.17-25 = 2005.6.3-4; 2000.144.1-9 = 2005.6.9-12.

⁴¹⁷ Hyg. *Const. Lim.* 2000.142.18-25 = 2005.6.4; Sic. Flac. *De Cond. Agr.* 2000.126.23-28 = 2010.4.33.

⁴¹⁸ Var. *RR.* 1.10.2; Hyg. *Const. Lim.* 2000.136.28-31 = 2005.1.26.

⁴¹⁹ Dilke (1971), 179, 184; Braudhead (2007), 155.

⁴²⁰ Chouquer (2008), 869-874; Bonnie (2009), 42-43; Mattingly (2011), 167-170, 182-187; Leveau (2010), 67-69; (2012), 81-83.

⁴²¹ Troussset (1997), 95-98, 107; Bonnie (2009), 3-5, 35, 48; Leveau (2010), 59-65.

consideration.⁴²² More importantly, Romano has conclusively shown how the surveyors adjusted *limites* to merge existing *iugera* with fresh additions to a *pertica* to expand and alter the profile of a community.⁴²³ Where survey trenches cut one another, one should suspect that the *agrimensores* have been at work to alter or otherwise obliterate the topographical features, which formed the physical matrix of a community's collective memory. In extreme cases where survey trenches totally overlay and erase the traces of an earlier community, it is likely that Roman politics required the complete refoundation of a colony, as surely as Roman warfare could destroy a city and force its rebuilding.

One difficulty in assessing the actual impact of the surveyors' craft on the landscape in relationship to the principles outlined in the *Corpus Agrimensorum*, is simply the fact that the more obvious physical remains of their activities have been obliterated. This is particularly true where the surveyors created *limites* without actually creating formal roads, whose bedding might be expected to stand the test of time. To overcome this obstacle, several archaeologists have turned to wetland studies, bio-archaeology and the study of historical transformation of the landscape to look at the impact of transformative processes on the landscape. Three important studies using wetland studies, pollen sample analysis and modern satellite surveying were recently undertaken at the cities of Arles, Valentia and Tarraco.

In the Vallée des Baux on the eastern edge of the plain of Arles, recent work undertaken by Philippe Leveau using geomorphology has demonstrated the close relationship between the mathematical precision, involved in aqueduct construction, drainage ditches, Roman field systems and the recovery of land from wetlands in a long-term development of a micro-regional urban landscape.⁴²⁴ The aqueduct, which was far more complicated than the one created by Nonius Datus at *Saldae* in Africa discussed in the previous chapter, began in the mountains north of Arles, ran west for 37 Km before turning south and then east through Durance to reach the site of Vallon des Arcs, where a secondary branch fed into it before the entire course ran another 13 Km to

⁴²² Romano (2006), 65, 73-74.

⁴²³ Romano (2006), 76-81.

⁴²⁴ Leveau (2010), 68-70; (2012), 81-83.

the city.⁴²⁵ This monumental water course required exact orientation using shadowsticks or portable sundials and a high degree of exact measurement in three dimensions simultaneously. In addition, there was also a series of drainage ditches that pumped water from the centre of the Vallée des Baux, preventing a natural rise in the regional water table from flooding land recovered from the wetlands for agriculture.⁴²⁶ The exact nature and extent of the mathematics used in both of these operations remain elusive, but the drainage ditches and the complex design of the aqueduct seem to reflect a sustained development of the landscape, where regular fields which might reflect a surveyor's *pertica* played a key part in agriculture and the maintenance of the city's urban infrastructure.⁴²⁷

At the same time, environmental core samples and pollen tests have been taken from the *pertica* identified from topographical features using field walking and satellite photography in the area around Valentia and Tarraco. These data show that surveyed areas located within the grid of *limites* were not equally exploited as investigation of Roman mining sites and agricultural areas in other regions suggest they should have been.⁴²⁸ While some sections of the grids identified at Valentia and Tarraco were intensively manured and cultivated, there were also many grid sections that remained forested and unoccupied. This suggests that the Roman survey at Tarraco may have enclosed more land than was needed for agriculture by the colonists, something which was certainly true at Emerita further south.⁴²⁹

The wooded zones may also suggest that the archaeologists working at Tarraco have identified sections of either *ager relictus* or *ager extraclusus*, two subcategories of *subsecivum* which were not included in formal allocations, either because of rough terrain or else because the plot was an irregular section which lay outside the *pertica* and inside the circular perimeter of the colony's territorial control.⁴³⁰ Regardless of the political identity of the wooded sections of land at Tarraco, the distinctions between the land there and at the Wadi Faynan reflect environmental change. These distinctions

⁴²⁵ Grewe (2008), 329-334; Leveau (2012), 83-86.

⁴²⁶ Leveau (2010), 68, 70; (2012), 98-101; Lewis (2012), 150-156.

⁴²⁷ Chouquer (2008), 869-872; Leveau (2010), 70; (2012), 101-102.

⁴²⁸ Palet Martínez, Orengo Romeu and Riera Mora (2010), 127-128; Mattingly (2011), 168-176, 180-185; Ortega, Orengo and Palet Martínez (2012), 73-75.

⁴²⁹ Palet Martínez, Orengo Romeu and Riera Mora (2010), 127-128; Mattingly (2011), 183-185; Edmondson (2011), 35, 39.

⁴³⁰ Campbell (2000), 321; Dubouloz (2012), 87-88.

influenced the intensive development of agricultural lands structured by the surveyors' introduction of *limites*.

Other archaeologists have recently also pointed out that even when the surveyors established *limites* to create a *pertica* to organise agricultural practices at a colonial site, it was simply one more act of human agency structuring a landscape that had its own historical and historiographical tradition.⁴³¹ The *pertica* still had to fit within that narrative and connect with the wider pattern of travel routes and land tenure, no matter how transformative it may have been. The project at Valentia, along with projects at Braga and in the region around Tongeren, have recently been undertaken using aerial photographs, field walking, historical records and modern geographic information systems to build up a historical profile of each region in antiquity and the Middle Ages.⁴³² The results from Braga and Tongeren have proven the most far-reaching.

Preliminary data published up to 2010 show that several Medieval manors and churches around Braga, constructed well outside the boundaries of the old Roman city, were built in alignment with a 20 actus grid of *limites*, which interfaced directly with an older pre-existing road network derived from an Iron Age complex and linked the colony to the hinterland. A similar study of Roman settlement sites and field-systems derived more from escarpments and natural features than roads around Tongeren suggests that an extensive grid of *limites*, oriented 50 degrees west of north, influenced the orientation of 75% of all church buildings built before 1500.⁴³³ This would tend to suggest that the mathematical alignment of Roman field boundaries, using the geometrical principles outlined above, influenced the regions far beyond the previous settlement sites for which they were created, even as they were adjusted to take older road-networks which were still used into consideration.

Furthermore, such a prolonged use of the system would tend to suggest an on-going influence of sociological, administrative and political institutions, which valued the system of *limites* as an organisational principle for the regulation of agriculture and

⁴³¹ Chouquer (2008), 469-472; Leveau (2010), 68-72; Mattingly (2011) 68-72.

⁴³² Bonnie (2009), 65-74; Reis Martines and Carvalho (2010), 289-293; Carvalho and Azevedo Mendes (2010), 155-157, 162-165; Ortega, Orengo and Palet Martínez (2012), 73-75.

⁴³³ Carvalho and Azevedo Mendes (2010), 157, 160, 162-163; Reis Martines and Carvalho (2010), 292-293.

travel. Indeed, recent studies further suggest that while there were practical advantages to the use of a grid of *limites*, much of the Romans' interest in the system was administrative and ideological. Both the initial creation of the colony and the creation of a *praefectura* entitled taking land from other communities, which invariably meant that indigenous land-holders and Roman colonists occupied land alongside one another.⁴³⁴ The creation of *limites* and geometrical patterns were therefore at once a direct act of appropriation and inclusion. On the one hand, the process appropriated the landscape walked and observed by the surveyors, and on the other it incorporated the identity of those who lived on the land into the Roman world by structuring, quantifying and providing legal standing for people before the Roman courts.

The key to this standing and inclusion was grounded in the documents produced by the surveyors detailing their findings and particularly in the *forma* or map, which could be used to negotiate the various features observed in the landscape back into an ideal conception of the world. As the bronze fragments of *formae* or cadastral documents from Arausio (Figs. 2.13 and 2.14) and Lacimurga show (Fig. 2.15), surveying documents could abstract features from the landscape, embrace them in *limites* that formed squares, attach names and political identities to those features and then project them in an image of the landscape not so much as it was experienced by individuals, but as it should be.⁴³⁵ This distortion is most obvious in the Arausio fragment, which presents a grid whose physical remains show that it was oriented five degrees east of north as being aligned due north. This feature, which some scholars have postulated was introduced to the Arausio tablets to make it easier for readers to understand the data presented on the map, seems to also pervade the Lacimurga tablet, the illustrated maps attached to the manuscripts of the *Corpus Agrimensorum* and to some extent the Verona tablet as well (Fig. 2.16).⁴³⁶ While the desire for clarity may alone explain this irregularity, it does not take what the authors in the *Corpus Agrimensorum* say about this set of documents into consideration.

Siculus Flaccus and Junius Nipsus provide the most basic information on the surveyor's map. They explain that the *forma* or map of *ager divisus et adsignatus* was a

⁴³⁴ Carvalho and Azevedo Mendes (2010), 155-157, 162-165; Edmondson (2011), 33, 39; De Giorgi (2011), 138-141; Dubouloz (2012), 82-86, 91, 93, 98-105, 118-122.

⁴³⁵ Gorges (1993), 11-15; Leveau (2010), 57-61.

⁴³⁶ Gorges (1993), 11; Cavalieri Manasse (2000), 5-8, 28; Bonnie (2009), 6, 9, 35.

document which could be drafted on wooden boards, parchment, papyrus or bronze, but that it was customary for one draft to be made on perishable material and filed in the Imperial record office, while another was cast in bronze and hung up on the wall of a public building.⁴³⁷ Furthermore, Flaccus provides the valuable observation that, while people other than surveyors could produce maps of their land, only maps produced by surveyors, who were presumably commissioned by the government of a community or the imperial administration, were considered to be valid and binding documents under law.⁴³⁸ As the passage from the works of Balbus quoted above proves, each *forma* or map was comprised of lines drawn on the document in the manner of an art-work to represent a *rigor*, sighted out in the field.

Moreover, the lines could be joined up in different ways to reflect different systems for organising land. As Flaccus observes, all maps should be one type of document, but some refer to land forming a *pertica*, others mention land organised by centuriation, others in terms of a measured area, some of land bounded by *limites*, some of land organised by cancellation or formal squares that were not centuries, and yet more to land comprised of a *typon* or the plan of a regular shape.⁴³⁹ Whatever the terminology attached to the map and whatever the structure of the land might be, the authors in the *corpus* were quite clear that it had to depict the *limites*. In fact, they were laid out with information about the orientation of the *kardo* and *decumanus maximus*, as well as notations for land under cultivation, wooded land, common pasture, *subsiciva*, land returned to the original inhabitants and other special categories of land-tenure, that reflected legal and political arrangements made by the founder of a colony or the magistrate responsible for organising the land of a *civitas*.⁴⁴⁰

Such notations were inscribed on the Arausio and Verona tablets, but are absent from the Lacimurga fragment, a fact which caused Chouquer to warn that not all surviving fragments of bronze or marble *formae* may have been genuinely used as functional maps in antiquity.⁴⁴¹ However, while fraudulent maps, as well as maps

⁴³⁷ Sic. Flac. *De Divis. et Assig.* 2000.120.22-32 = 2010.4.2-4; Iun. Nips. *Lim. Rep.* 185-189.

⁴³⁸ Sic. Flac. *De Cond. Agr.* 2000.104.29-33 = 2010.2.2.

⁴³⁹ Sic. Flac. *De Divis. et Assig.* 2000.120.22-26 = 2010.4.2.

⁴⁴⁰ Hyg. *De Lim.* 2000.76.7-11 = 2010.1.2; 2000.78.1-4 = 2010.1.9; Hyg. *De Cond. Agr.* 2000.84.3-33 = 2010.2.27-33.

⁴⁴¹ Piganiol (1962); Cavalieri Manasse (2000), 5, 28; Chouquer and Favory (2001), 56, 58; Dubouloz (2012), 92-93, 96, 98.

created by people who were not authorised to do so, were a problem in antiquity, the absence of names on the fragment from Spain hardly seems to have enough justification for discounting the fragment. Above all, it may have been that the units shown on that particular part of the map were surveyed but not yet allocated to colonists at the time the *forma* was produced.⁴⁴² The assignment of additional colonists, as well as changes in the status of individual allotments within the *pertica*, was the reason that the author of the *De Conditionibus Agrorum* insisted that surveyors check not only the laws establishing a colony and its associated *forma*, but also the *commentaria*, *epistulae Caesaris* and *edicta* to make sure that nothing had been added or changed after the initial foundation.⁴⁴³ As Arnaud and Campbell have demonstrated, such documents could almost always be found stored in either the colonial or provincial archives and in the imperial archives at Rome.⁴⁴⁴

Two final complications need to be taken into consideration before concluding this discussion. One is the fact that land marked off by *limites* in a *pagus* or which was simply *adsignatus* to a community without being *divisus* was also depicted on *formae*. Very little information has survived about what such documents looked like or how they may have been composed. The clearest statement on the matter comes from Frontinus, when he states that land assigned to communities as civic territory, the land of private owners and much of the provincial land subject to taxation was simply enclosed by an outer boundary and depicted this way on the *forma*. However, in some cases, civic land that was allocated in this way was depicted on the *forma* as if it had been given *limites*.⁴⁴⁵ This first suggests that land for private land-holders could be illustrated with the same methods as the land of a community or province, and that surveyors could draft the *forma* to depict features of the landscape, which did not truly exist in reality, but which the surveyors and their administrative superiors believed should be depicted to structure human relationships.

The use of imaginary features as a bases for regulating land-use or tax collection within a pictorial record would have required the presence of extensive *commentaria* to provide explanations of what was intended. This suggests that the close relationship

⁴⁴² Maganzani (2007), 10, no. 23; Edmonson (2011), 33, 36.

⁴⁴³ Hyg. *De Cond. Agr.* 2000.84.31-33 = 2010.2.33.

⁴⁴⁴ Maganzani (2007), 10, no. 23; Edmonson (2011), 33, 36.

⁴⁴⁵ Front. *De Agr. Qual.* 2000.2.11-17 = 2005.1.3.

between image and text postulated above for the writings of Balbus extended to other surveying documents as well. It also returns the discussion to the main point of Balbus' text, which was that the *rigor*, formed between two markers, was the abstract line connecting both points in the landscape, and when it was drawn in a document transposing those physical points into the abstract plain. Jean-Yves Guillaumin argued in an article, which most scholars studying the *forma agrimensorum* have not considered:

Dès lors, la *forma* elle-même se trouve investie d'une double nature, participant à la fois, si l'on a recours au vocabulaire platonicien, du monde de l'intelligible et du monde du sensible. Elle est d'une part l'archétype abstrait selon lequel se fera la division du terrain: grille parfaite, ensemble ordonné de carrés de valeur symbolique très forte; et d'autre part, matérialisation au sol de cette perfection, norme qui se traduit par le plan cadastral. A vrai dire, elle est intermédiaire entre l'intelligible et le sensible: ni purement νοητὸν, ni purement αἰστόν, elle relève exactement des διανοητά (et l'on sait que la mathématique est justement définie par la tradition grecque comme appartenant aux διανοητά, car elle touché d'un côté au monde intelligible, mais la matérialité inévitable de ses êtres la relie malgré tout au sensible); elle manifeste dans le monde humain la perfection du monde intelligible et divin; et, en termes aristotéliens, elle médiatise le travail de la "formed" (εἶδος) sur la "matière" (ὕλη). Aussi la *forma*, dans sa réalisation la plus dépouillée, ne sera-t-elle pas alourdie d'éléments soumis au changement comme le sont les noms des propriétaires de parcelles: on en a un témoignage dans ce fragment de bronze récemment découvert en Espagne, qui comporte comme seule indication, dans les aires orthonormées qu'il définit, l'indication de la valeur égale de leur surface.⁴⁴⁶

Guillaumin's interpretation of the role of mathematics in the formation of the *forma* tends to suggest that the document served two functions: it recorded features in the landscape, which could be used to resolve disputes, but it also structured the way people interacted with the landscape by defining how it should be. Some aspects of this come out in the illustrations that accompany the original manuscripts of the *Corpus Agrimensorum*. As two recent studies have remarked, these illustrations use mathematics, particularly right angles to form boundaries and structure the landscape, but they also use artistic elements, which clearly express engagement with the landscape and the abstract at the same time (Figs. 2.17 and 2.18).⁴⁴⁷ The so-called maps tend to render walls and towers in shades of tan and grey, mountains used to bound the

⁴⁴⁶ Guillaumin (1994), 288-289.

⁴⁴⁷ Acolat (2005), 12-13, 16, 19, 20-23, 31-32; Peterson (2006), 155-158.

landscape tend to be conical green or brown features, while the trees, symbolising forests, tend to be brown vignette and water, in the form of swamps, bays and streams, appear as thick black or dark blue lines or closed basins with ripples containing depictions of fish and ducks.

These elements, along with the formal geometric features that indicate the man-made *limites* of the surveyors, suggest a world where those who consulted the archives to view these documents, expected to see not just what was in the landscape, but what people should find there both in terms of natural resources and human structures. Such an ideal projection of the landscape would require that the depiction of a colonial *pertica* fits as seemingly as possible into a universal paradigm while depicting what had been constructed in the landscape, necessitating the shift in orientation, found in the Arausio tablets and other documents.

Therefore, in theory and depiction, every colony was oriented to true north even when it was not. Using such maps in the field, as Junius Nipsus clearly states, one should be able to orient the direction of the *kardo* and *decumanus maximus* and establish the identity of boundary markers. It would not have been easy. Perhaps one of the hallmarks of the surveyor and his craft was not only an ability to be seen making them, but to read the maps other surveyors had made in order to manipulate and regulate human perceptions of the world.⁴⁴⁸ The creation and manipulation of documents, which blended mathematics and law, were at any rate at the heart of the Roman world. Surveying can be considered the main tool used by the administration to collect taxes and regulate the business of an Empire comprising many cultures.

⁴⁴⁸ Jun. Nips. *Flum. Var.* 159-175.

Chapter Three: Whose Land Is It Anyway: *Agrimensores*, Boundaries and the Peoples of the Empire

“The farmer was a humble man yet, stripped bare by his wealthy neighbour’s greed, he wished at least to be buried where his family had always farmed, and so with some trepidation he’d invited a group of friends to gather formally to mark the boundaries”.⁴⁴⁹

“At the distance of 120 feet: Quintus Julius Rufus, son of Publius, from the Galerian Tribe, surveyor to the *Siccaenae* (is buried here)”.⁴⁵⁰

3.1 Introduction

Quintus Julius Rufus was a Roman citizen and an independent surveyor, who was probably born in Italy and died in the province of *Baetica* sometime before the accession of Claudius. The reasons for Rufus’ presence in Spain are unknown, though like most surveyors, he was doubtless concerned with the organisation of land in the provinces and with the resolution of property disputes, like the one described above. His independent status, the total absence of a dedication and the reference to the *Siccaenae* suggests that he was employed in a professional capacity by that *civitas*. Why Rufus should have been employed as an independent surveyor by this provincial community remains as much a mystery as the identity of those who buried him.

The tombstone (Fig. 3.1), which is unique in the Iberian Peninsula, however, shows a remarkable familiarity with both Roman burial practices and the conventions of Roman surveying. Rufus was identified by his full Roman *tria nomina* and voting tribe, and, in addition, those who constructed the tomb specified that there was to be a distance of one hundred and twenty feet, a standard unit of measurement used by Roman surveyors, between the burial plot and the road.⁴⁵¹

⁴⁴⁹ Apul. *Met.* 9.38 (translated by A. S. Kline).

⁴⁵⁰ App. 1.2.

⁴⁵¹ Dilke (1971), 82-83; Meyer (1990), 75-78; Salway (1994), 127-130; Borg (2011), 51-53.

This chapter will explore how surveyors like Rufus were introduced to the provincial populations of the Empire and the impact that they had on the development of Roman culture and civilisation in the provinces. To accomplish this, the chapter will first explore the nature of Roman boundaries and land ownership to establish exactly what it was that the Roman administration expected the surveyors to achieve in establishing boundaries. It will then investigate points of contact between the Roman administration and provincial populations, in which the actions of the *agrimensores* would provide a positive incentive for the subject populations to adopt Roman surveying and surveyors for themselves. Much of the focus in this part of the chapter will be on the structure and organisation of communities in the provinces and the regulation of inter-state boundary lines. Finally, the chapter will look at how the provincial population both resisted the activities of Roman surveyors and in turn used surveyors to resist the Roman administration.

3.2 Roman Surveying: Centuriation and Beyond

Here it is necessary to reiterate a point that was set out in the previous chapter. Roman surveying and survey theory were more than just a matter of centuriation. As has already been remarked, centuriation features very prominently in modern scholars' perceptions of the Roman world, but it is unclear from the physical remains on the ground just how common this rationalisation and reorganisation of the landscape really was in antiquity.⁴⁵² Recent reassessments of centuriation patterns have shown that while centuriation may shape the landscape around a Roman colony to a considerable distance, it was only one component of a more complex strategy in the use of the natural environment.⁴⁵³ These strategies tended to involve the introduction of roads, the creation of boundary demarcations using natural and man-made features, and the adaption or alteration of watercourses. By contrast, centuriation as Michel Tarpin and Daniel Gargola have both observed, was merely a Roman cultural form of land management intended to facilitate veteran settlement, legionary recruitment and taxation.⁴⁵⁴

⁴⁵² Terrenato (2007), 144, 152-153.

⁴⁵³ Bonnie (2009); Reis Martines and Carvalho (2010); Dellong (2010); Palet Martínez, Orengo Romeu and Riera Mora (2010); Ortega, Orengo and Palet Martínez (2012).

⁴⁵⁴ Tarpin (2002), 211; Gargola (2004), 217.

While centuriation could be used to organise agriculture and tax-collection in land that was controlled by non-Roman *civitates* within the Roman Empire, there is very little evidence to show that the lands of non-Roman *civitates* outside Africa were commonly centuriated.⁴⁵⁵ Rather, scholars have found a range of different forms of land-ownership and habitation in the territory controlled by Rome, which cannot be reduced to a single organisational principle, size or structural typology.⁴⁵⁶ As a consequence, the Romans engaged with a range of discrepant local concepts of spatial organisation with the application of the taxonomic categories, considered in the previous chapter. This taxonomic structure was then bound together through a web of interpersonal relationships to form a highly stratified landscape.⁴⁵⁷

An abundance of evidence shows that the Roman administration regulated the boundaries between non-Roman *civitates* within the Empire.⁴⁵⁸ But, as the previous chapters have shown, such regulation was not carried out by the surveyors in a vacuum. Local elites were very much involved and those elites themselves may have sought to regulate the boundaries of other *civitates* in terms of the Roman legal system as a part of regional power dynamics.⁴⁵⁹ In light of this, it is perhaps significant that there is no evidence to show that the *Siccaenae* either had their lands centuriated or sought a Roman surveyor to carry out such an operation. This suggests that the reason for Quintus Julius Rufus' presence in Spain was more involved with inter-state political activities conducted by the *Siccaenae*, their assertion of control over territory and the surveyors' expertise in the creation and regulation of both internal and external boundaries under Roman law.

3.3 Structure and Shape in the Roman Landscape

As discussed in the previous chapter, surveyors were expected to fully understand the nuances of the juridical taxonomy of settlements and land-division described by Frontinus and Agennius Urbicus. This taxonomy established obligations and awarded

⁴⁵⁵ Decourt and Mottas (1997); Woolf (1998); Keay (2003); Briand-Ponsart and Hugoniot (2006); Sahin and Adak (2007); Bonnie (2009); Mattingly (2011).

⁴⁵⁶ Chouquer (2010), 87, 89-93; Mattingly (2011); 143; Revell (2014), 383, 388-393.

⁴⁵⁷ Chouquer (2010), 90-96, 105, 107-108; Mattingly (2011), 71-72, 133-138, 210-211, 216-220, 223-225, 237-239.

⁴⁵⁸ App. 2.1, 2.2, 2.3, 2.5, 2.49, 2.53, 4.55; 1940.0070; Campbell (2005), 320-321, 323, 327.

⁴⁵⁹ Ager (1989), 109-112.

benefactions to a civic body – recognised by the Roman central administration using a sliding scale that ranged *vici* and *pagi* – rendered subordinate to another community to the most powerful of Roman colonies. In all cases, the surveyors employed the three-fold system of intervention to regulate their civic territory. Land was either divided and allocated through the creation of *limites*, allocated but not divided, or left unregulated as *ager arcifinius*.⁴⁶⁰

The first two categories, which were applied to most formal communities, were distinguished from the third through the delineation of a circular perimeter, enclosing an urban core and its dependent *fundi*, which were regulated by the communities' own internal taxonomy.⁴⁶¹ *Ager arcifinius*, also called *occupatorius*, was taken over by a *possessor*, usually in war, and structured using paths and boundaries, which a surveyor could describe geometrically, even though they followed natural features in the landscape, rather than being formed from geometrically constructed units. The sliding scale of civic status allowed the administration to reward and punish communities which came under its sway. Thus, the graded system for organising the landscape allowed the Roman administration to engage with a discrepant range of indigenous systems of land-tenure.

As Christopher Tilley has recently argued, most subsistence agriculturalists inhabit and move through a landscape which was focused on a fixed community with its adjacent fields and paths, whose character was structured by monuments and the agricultural cycle.⁴⁶² This made the adaptation of allocated, or allocated and divided land, comparatively straightforward, since the Romans developed both principles in the context of their own agricultural activities, as Daniel Gargola and Okko Behrends have argued.⁴⁶³ At the same time, while Gerard Chouquer has argued that the Romans viewed pastoralists and nomadic societies as bandits, who were disruptive to the development of the urban structure of the Empire, evidence from boundary disputes involving livestock considered below suggests that in practical terms the main concern of the Roman administration may have been the unfettered movement and/or the grazing of

⁴⁶⁰ Front. *De Agr. Qual.* 2000.2.3-23 = 2005.1.1-4.

⁴⁶¹ Front. *De Agr. Qual.* 2000.2.3-17 = 2005.1.1-3; Balb. *Ad Cels.* 2000.208.4-12; Hyg. *De Cond Agr.* 2000.78.21-32 = 2010.2.1-2; Sic. Flac. *De Cond. Agr.* 2000.118.37-120.17 = 2010.3.4-8; Hyg. *Const. Lim.* 2000.134.3-14 = 2005.1.1-5; 2000.136.13-17 = 2005.1.21; 2000.162.3-12 = 2005.20.7-12.

⁴⁶² Tilley (2012) 24-25.

⁴⁶³ Gargola (2004), 128-131; Behrends (2014), 12-14, 22-23.

livestock.⁴⁶⁴ As Tilley has remarked, pastoralists tend to move their animals along traditional pathways between fixed seasonal habitation sites with varying degrees of structured demarcation.⁴⁶⁵ But, those traditional pathways may not have always fostered peaceful relations with agriculturalists, particularly when those agriculturalists were newcomers to a region, as many Roman colonists were.

As the discussion of passages from both the *Corpus Agrimensorum* and the *Digest* of Justinian in the previous chapter shows, the Roman administration was deeply concerned with the regulation of roads and rights of way.⁴⁶⁶ Jurists and surveyors alike engaged in a lively discourse over the taxonomy and physical width of paths and roads, since the lines of demarcation separating both private property and communities also functioned as thoroughfares, merging the legal classification of boundaries with that of rights of way.⁴⁶⁷ As Siculus Flaccus explains, each right of way, like the land it bounded or crossed, had its own administrative category, establishing who had the privilege of using it, what mode of transport they could use, its availability to cattle-drovers and the identity of those responsible for its upkeep.⁴⁶⁸

The Roman landscape, however, consisted of more than just the quantified boundaries surrounding human settlements and the roads that connected or separated them. Jean-Marie Kowalski has argued that rivers were permeable or “soft boundaries”, defining and compartmentalising the use of the environment in informal ways, even as people used them to travel, exchange resources and ideas, and conceptualise the world.⁴⁶⁹ Tonnes Bekker-Nielsen has further argued that the Romans, who considered rivers and the sea to be subject to the *ius gentium* and therefore regulated exclusively by the emperor, nonetheless incorporated these permeable spaces into their legal taxonomy of formal boundaries.⁴⁷⁰ Such an approach to the landscape, pragmatically took

⁴⁶⁴ Chouquer (2010), 109-110.

⁴⁶⁵ Tilley (2012), 25.

⁴⁶⁶ Laurence (1999), 79-86; Kaiser (2011), 31-35; Moeller (2014), 73, 76.

⁴⁶⁷ Agen. Urb. *De Contr. Agr.* 2000.22.32-24.4; 2000.46.12-15; Hyg. *De Lim.* 2000.76.3-7 = 2010.1.1; *De Cond. Agr.* 2000.88.1-9 = 2010.2.45-47; Hyg. *Const. Lim.* 2000.136.2-12 = 2005.1.18-20; 2000.140.4-16 = 2005.3.6-8; 2000.152.22-24 = 2005.11.14; Cels. *Dig.* 8.1.9; Ulp. *Dig.* 8.3.1; Paul. *Dig.* 8.3.7Pr; Iaul. *Dig.* 8.3.13.

⁴⁶⁸ Sic. Flac. *De Cond. Agr.* 2000.112.9-33 = 2010.2. 26-32; compare also: Hyg. 2000.98.37-100.3 = 2010.3.34.

⁴⁶⁹ Kowalski (2012), 74-75, 81, 83.

⁴⁷⁰ Bekker-Nielsen (2014), 137-139, 143-144.

advantage of the human tendency to both stop at and travel along or across natural features, even as it imposed artificial quantitatively described lines of demarcation.

The interlocking relationship between formal and informal boundaries, comprising lines of demarcation formed from or crossed by a segmented assemblage of transport routes, organised the Roman Empire into a fragmented mosaic of interlocking personal and regional concepts of space, land-ownership and territorial identity.⁴⁷¹ At the core of these interlocking concepts, as Gerard Chouquer has argued, was the occupation of specific places within the environment by individuals, transforming the ground into a resource for exploitation; their discourse with both the local community and the wider world over what constituted proper or improper use and ownership.⁴⁷² Under the Principate, this discourse was guided by local customs operating under the umbrella of the Empire's taxonomic administrative hierarchy, which placed a restriction on the use of violence and introduced an external source of arbitration.⁴⁷³ This umbrella structure placed *fundi* as both small-holdings and *villa* estates as the fundamental building blocks for a stratified hierarchy, connected by a graded network of paths and roads feeding into *vici*, *pagi*, *castra* and a variety of *urbes*.

These nucleated settlements, identified along a sliding scale of size, were the differentiated nodal points in an overlapping stratigraphy of power and authority. As several of the case studies below show, the various grades of *urbes*, namely colonies, municipalities and *civitates*, had a varying degree of social and political power within the province and could own or control extra-territorial tracts of land in one another's territory. Likewise, individuals who travelled along the various segmented inter-state routes could acquire property in multiple communities, stimulating disputes over ownership and civic authority. Resolution of these disputes could be done under a variety of local or imperial legal systems, since a surveyor's authorisation to act always came from their employer. Besides, depending on who initiated the project, surveyors could find themselves negotiating the overlapping and competing authority of magistrates from *civitates*, *praefecturae*, *pagi*, municipalities, colonies and even the imperial administration itself.

⁴⁷¹ Ingold (2007), 74-76, 81; Chouquer (2010), 92; Kolb (2013), 114-115.

⁴⁷² Chouquer (2010), 89-91.

⁴⁷³ Feissel and Gascou (1995), 71-72; Campbell (2005), 310, 313, 321; Kokkinia (2006), 184-186; Brelaz (2008), 50; Humfress (2013), 83-86.

But, whatever else employing a surveyor such as Quintus Julius Rufus might bring, the *civitas* of the *Siccaenae* and communities like it had to be willing to at least tacitly recognise Roman law and accept the Hellenistic principles of proof and the performative procedures of the surveyors' craft. Without that no surveyor could regulate land and the human relationships which governed its use. However, their choice to do this may not have been entirely acquiescent, nor may it have been imposed from outside. The leadership of the *civitas* may have adopted the services of Rufus in response to the activities of both Roman and non-Roman citizens, living in their territory, as a means of regulating their own boundaries with neighbouring populations or even to regulate the boundaries of other *civitates* under the auspices of the Roman administration. To appreciate this, the rest of this chapter will look at the activities and impact of surveyors at first the local and then the regional levels.

3.4 Private Ownership and the *Fundus* in the *Civitas* of the *Cantiaci*

While numerous passages in the *Corpus Agrimensorum* demonstrate the overwhelming importance that assessing private land played in the administration of the Roman Empire, most of the discussion of land, attached to a *fundus* or other forms of private property, involves formulaic proscriptions, depicting the sort of thing that a surveyor might encounter or the course of action a surveyor should or must undertake.⁴⁷⁴ Such descriptions, though helpful for understanding the theoretical nature of surveying – as outlined in the previous chapter – and its relationship to Roman law, do not inform on the impact of surveyors on the lived experiences of land-holders in the Empire or the reasons as to why a non-Roman *civitas* might choose to employ a Roman surveyor.

Fortunately, five documents from across the Empire survive to provide a window on the impact of surveyors on property-owners in the seventy-year period from the death of Nero to the accession of Antonius Pius. Two of the documents, one from *Londinium* in Britain and the other from *Herculaneum* in Italy, are wooden writing tablets recording part of the proceedings for boundary or property disputes. The other three documents, from Nikšić in Dalmatia, *Daulis* in Greece and *Histonium* in Italy, are

⁴⁷⁴ Campbell (1996), 85-86; Gargola (2004), 127-129; Bispham (2006), 74-78, 87-88, 97-102, 122-126; Broadhead (2007), 149-154; Terrenato (2007), 139-143; Bekker-Nielsen (2014), 11-20; Behrends (2014), 15-17, 22-26, 36-37.

all inscriptions that record the restoration of boundaries or the final verdicts in property disputes. Four of these documents are considered here, while the inscription from Nikšić will be discussed in another section along with several documents from Africa.

Of all these documents, the one which is perhaps most representative of the majority of the populations' experience is the enigmatic tablet from *Londinium* (Fig. 3.2). This document records an investigation into the sale of what Roger Tomlin has suggested was a small sacred grove in the territory of the *Cantiaci*, probably by the senior magistrates of the *civitas*.⁴⁷⁵

In the consulship of the Emperor Trajan Hadrian Caesar Augustus for the second time, and Gnaeus Fuscus, on the day before the Ides of March. When he (the magistrate) had arrived at the property in question: fifteen *arpennia* of land, more or less, in the Verlucionian wood, which is in the *pagus* of Dibussu... in the *civitas* of the *Cantiaci*, and bounded by the estate of ... and the estate of Caesennius Vitalis and the village road, Lucius Julius Bellicus declared he had bought it from Titus Valerius Silvinus for forty *denarii*, as is contained in the deed of purchase. Lucius Julius Bellicus also testified that he...⁴⁷⁶

Civic magistrates, such as the one mentioned in this document who adjudicated claims of ownership in property disputes, tended to use procedures and laws derived from within their own jurisdiction, but those laws and procedures were frequently adapted to fit Roman norms since the organisation of property-ownership in a *civitas* depended upon the surveyors' activities. When surveyors established the outer perimeter of a *civitas*, it was customary for individual land-holders to accredit their title to a holding by estimating the amount of land contained within boundaries established through the naming and identification of adjacent holdings or public rights of way.⁴⁷⁷ In addition, as Siculus Flaccus, Frontinus and Agennius Urbicus explain, property-holders did not require the presence of a surveyor to establish a property demarcation in all cases, since surveyors did not normally investigate a legal claim on land such as this, but property-holders could not establish one unilaterally and were expected to have the

⁴⁷⁵ Tomlin (1996), 213; Chouquer (2010), 120-121, 129; Metzger (2013), 215-223.

⁴⁷⁶ App. 4.67 (with the translation adapted from Tomlin (1996), 211-212).

⁴⁷⁷ Pap. Dig. 10.1.11-12; Ulp. Dig. 50.15.4; Agen. Urb. *De Contr. Agr.* 2000.44.14-17, 29-42; Front. *De Agr. Qual.* 2000.2.12-17 = 2005.1.3.

Roman authorities recognise it.⁴⁷⁸ Rather, all claims on land, and the boundaries which defined it, had to be made, not just in the presence of the magistrates, but in the presence of the neighbouring land-holders as well. This practice was binding for Roman and non-Roman citizens alike, as the documents from *Herculaneum*, *Histonium* and *Daulis* considered below show.

But, declaring the limits of one's property in the presence of the community was not simply a matter of good manners to be observed in the interest of maintaining peaceful relations with other landholders. It was also a matter of gaining the acceptance of a foreign power. Theoretically at least, all land outside of Italy was either owned by the Roman people or under the control of the emperor by virtue of his *imperium*, making it impossible for private people without Roman citizenship to own property. In practice, however, much land seems to have been regulated through the *ius peregrinus* and *ius gentium*, opening it to occupation and private ownership under the auspices of the emperor, unless it was allocated to a community through a formal allocation undertaken by Roman surveyors.⁴⁷⁹ The surveyors' intervention in the *civitates* of the empire, at the request of both the Roman authorities and the community itself, meant that non-Roman citizens residing in a non-Roman *civitas* could still find themselves subject to Roman law and Roman courts, if someone had the resources and desire to access them.⁴⁸⁰ This was particularly true when Roman citizens, such as those mentioned in the document quoted above, acquired land within the territory of a *civitas*. As Nicholas Purcell has eloquently argued, individual Roman citizens living in the provinces, though being a small minority, could still exert a remarkable amount of influence on the non-Roman communities where they resided.⁴⁸¹ This provided a powerful incentive for the leadership of *civitates* to do things the Roman way in order to secure the property rights of their own citizens and avoid problems with the dominant power.

Something of this socio-political influence can be seen in the text of the wooden writing tablet quoted above. The use of the Celtic name Verlucionius to define the grove

⁴⁷⁸ Front. *De Contr.* 2000.8.3-7 = 2005.2.14; Agen. Urb. *De Contr. Agr.* 2000.44.14-32; Sic. Flac. *De Cond. Agr.* 2000.104.29-38 = 2010.2.2-3.

⁴⁷⁹ Cic. *De Off.* 3.17.69; Gai. *Inst.* 1.1, 2.7, 2.21; Ulp. *Dig.* 1.1.1.4-5, 41.1.31Pr; Campbell (2000), 335-336; Ando (2011a), 29-32.

⁴⁸⁰ P. Euph. 1; Feissel and Gascou (1995), 71-72.

⁴⁸¹ Crawford (2008), 630-640.

and its quantification using the Gallic measurement of the *arepennis* indicates that the property was defined by someone of Celtic heritage. Since groves were considered sacred under both Celtic and Roman religion, it may have been a significant cultural location for the community prior to Roman intervention, or it may have been a cultural construct formed through interaction between indigenous members of the *civitas*, foreign immigrants from the continent and Roman administrators.⁴⁸² In either case, its structural identity – as recorded in this document – was unquestionably a hybrid product of Iron Age and Roman concepts, since the Gallic *arepennis*, which may not have been used by the people of Britain prior to the Roman occupation, was syncretised to the Roman *actus* by the reign of Hadrian, as was the Greek *plethora* employed in the case from *Daulis* discussed below.⁴⁸³

While the name of the site is indisputably British in origin, a more important point for understanding its character is that the individuals who first delimited the grove as part of a *pagus* simply estimated the amount of land attached to each property by quantifying it in round units of five. This was the common practice attested as the normal method of organisation used by surveyors for land that was let out for lease throughout the Empire.⁴⁸⁴ The employment of an inexact method of quantification for this property suggests that the original owners of the land were keen to have the Roman administration recognise the grove's existence, but were not so concerned with exact units that they invested in a full formal definition in which each internal property-line was measured. This may in turn reflect their desire to rent the land out, but the presence of *fundi* with Latin titles would tend to indicate that it reflects an attempt by the *civitas* to accommodate the presence of Romans, who acquired property within the community and the application of the Roman census process.

At the same time, Oswald Dilke and Roger Tomlin may be right when they see this structural definition of space in terms of a *pagus* as reflecting the forcible centuriation of provincial land associated with the settlement of Roman veterans in

⁴⁸² Tac. *Ann.* 14.30; Plin. *Nat.* 16.249; Luc. *BC.* 1.450-458; Pomp. Mel. *De Chor.* 3.2.18-19; Sic. Flac. *De Div. et Ass.* 2000.130.7-11 = 2010.4.47; Hyg. *Const Lim.* 2000.156.6-9 = 2005.13.11.

⁴⁸³ Col. *RR.* 5.1.6; Isid. *Orig.* 15.15.4; Front. *De Lim.* 2000.10.23-26 = 2005.3.10; Hyg. *De Cond. Agr.* 2000.90.2-9 = 2010.2.53-55.

⁴⁸⁴ Ulp. *Dig.* 50.15.4, 50.16.60; Hyg. *De Gen. Contr.* 2000.98.9-14 = 2010.3.28; Sic. Flac. *De Cond. Agr.* 2000.132.7-15 = 2010.4.58-59.

individual allotments or through the regulation of Arcifinial land.⁴⁸⁵ All the land-holders mentioned in the documents were unquestionably Roman and they may have seized or been allocated land in the territory of the *Cantiaci* during the early days of conquest. If one accepts this explanation, however, two points should be kept in mind. First, as the discussion of the inscription from *Daulis* below shows, not all acts of centuriation were carried out as part of Roman colonisation. Surveyors frequently deployed various procedures used in centuriation to resolve problems between the indigenous inhabitants of a community and outsiders who acquired land within their territory. Indeed, this was perhaps the most common reason for surveyors to intervene in property or boundary disputes within the territory of a single community. Secondly, evidence for the structural identity of Roman *pagi*, discussed by Michel Tarpin, Murielle Faudet and others, suggests that these outlying rural districts were present at many un-centuriated settlements and that even when they were attached to divided and allocated land, *pagi* were not commonly centuriated.⁴⁸⁶ This is a matter that is discussed further below where the impact of Roman colonial *pagi* and *praefectura* on indigenous *civitates* is considered.

3.5 The Measurement of Monumental Memory and Self-Identity

Regardless of whether the land was formally centuriated or left as irregular plots, whose size was simply estimated in surveying terms for tax purposes, the community was allocated land with an administrative structure. It was quite different from the open organisation of property in Iron Age Europe, since it contained urban, extra-urban and rural land.⁴⁸⁷ In negotiating this socio-political transformation, the *Cantiaci*, like so many nations which came under Roman rule, had to simultaneously engage with the expectations of the Roman administration while creating a space which reflected who, and what, they were as a community.⁴⁸⁸ Some of this transformation may have been negotiated at the highest levels of the *Cantiaci* leadership,⁴⁸⁹ in a manner analogous to that which scholars have postulated Augustus carried out after *Actium*, manipulating old cultural ideas and merging them with newly structured spaces.

⁴⁸⁵ Dilke (1971), 191-193; Tomlin (1996), 214; Dubouloz (2012), 92.

⁴⁸⁶ App. 4.7, 4.9, 4.10, 4.48, 4.49; Tarpin (2002), 14-16, 33-37, 49, 193, 195-199, 204-211, 219, 223-226, 254, 270, 405, 409; Faudet (2006), 116-117, 120; Santangelo (2006), 624-626.

⁴⁸⁷ Tac. *Germ.* 16.1-4; Isid. *Etym.* 15.2.12; Behrends (2014), 14-15.

⁴⁸⁸ Paus. 7.18.7-8; Goldhill (2010), 61-66.

⁴⁸⁹ Metzger (2013), 215-223.

The scope was to create fresh communal memories that seem timeless in order to establish a sustainable sense of community to meet the vicissitudes of change.⁴⁹⁰ However, as many scholars have been at pains to argue, the true success of any such transformation depended upon individuals within the community, who structured memory and space along very different lines from those of the Classical tradition, bringing together memories and concepts of space from several cultures to create a new identity for themselves.⁴⁹¹ Several texts from the Roman Empire provide hints as to how the surveyors may have interacted with private land-holders within *civitates* such as the *Cantiaci* to bring this about.

3.6 Living with your Neighbours: Surveyors and Arbitrators at *Histonium*

While the activities of the Roman administration in the regulation of property-ownership and interstate boundary disputes in the provinces have received considerable attention, the actions of individual land-holders and their impact on the development of communities within the Empire have received far less attention from modern scholars. This is in part due to the fact that only a handful of documents recording this sort of information have survived from antiquity, and those which have, like the document from London, tend to be very fragmentary. The two best examples come from a wooden tablet from *Herculaneum*, dated to around 70 AD (Fig. 3.3), and a stone tablet from *Histonium* dating to around 74 AD. They are both relevant to the intervention of private arbitrators in disputes involving the *fundi* of private land-holders, who, like Julius Bassus, acquired property in communities where they were not necessarily originally citizens.⁴⁹² The document from *Histonium*, which is far more significant for this discussion, reads:

Gaius Helvidius Priscus, arbitrator by common agreement between Quintus Tillius Eryllus, *procurator* of Tillius Sassius, and Marcus Paquius Aulanius, advocate of the municipality of the *Histonienses*: when both parties were present and he himself had taken the oath, he proclaimed his verdict in those words which are written out below.

⁴⁹⁰ Wallace-Hadrill (2008); Sumi (2009), 168-169.

⁴⁹¹ Compare: James (2001), 190-195; Woolf (2001), 173-178; Grant (2012), 69-76; Snead (2012), 111-122.

⁴⁹² Arangio Ruiz and Pugliese Carratelli (1955), 453-454, no. 79; Vinci (2008), 13-16.

When an old book which Tillius Sassius wished to have considered as evidence was produced by the advocates of the *Histonienses*, and in it was written a verdict concerning the boundary of the places which were being disputed produced by Quintus Coelius Gallus, when Marcus Iunius Silanus and Lucius Norbanus Balbus were consuls, 8 days before the Kalends of May (24th April, 19 AD), between Publius Vaccius Vitulus, prior owner of the Herianican farm of the *Histonienses* and Titia Flacilla, an even earlier owner of the Vellanan farm of Tillius Sassus. Because the subject of the disagreement in the present matter involved a boundary dispute, once the landowners of both estates were present, Gallus established the boundary, in such a way that he planted the first wooden boundary post approximately eleven feet from the oak tree. Then there was a wooden boundary post which was not far from a ditch, though the interval which was written down is not clear because, on account of its age, the book has a gap in the spot where the number of feet appears to have been written. Then between the ditch and the wooden boundary post was a public right of way which was the sole responsibility of Vaccus Vitulus. From the wooden boundary post and its environs (the boundary went in a straight line) to an inscribed ash tree where a wooden boundary post was planted by Gallus, and then from this wooden boundary post and its environs (the boundary went in a straight line) to the bank of the furthest-most pond of Serranus. On the far left hand side (of the property) the boundary was aligned back to the starting point by Gallus...⁴⁹³

The two properties, which formed the core of the dispute arbitrated by Gallus, may have been established when a group of Caesar's veterans were settled at the *municipium* of *Histonium* sometime in the mid-40s BC.⁴⁹⁴ When Publius Vaccius Vitulus and Titia Flacilla took possession of the two *fundi* early in the reign of Tiberius, the boundary line between the properties was probably marked by ditches and trees, as was common in land that was allocated, but not divided, and they quarrelled over the extent of their respective estates. To resolve the dispute, Gallus investigated the evidence for the original boundary-line, assembled both parties on the land, and citing Herianicus and Vallanus as the names of the original owners, planted wooden boundary markers in their presence to re-establish the formal demarcation.

While there were no physical barriers or fences separating Vitulus and Flacilla, Gallus did not rely entirely on their mutual respect for his authority alone to maintain peace and the integrity of the two properties. Rather, in keeping with the archival practices discussed in the previous chapter, Gallus created a contractual bond between

⁴⁹³ App. 4.12.

⁴⁹⁴ *Lib. Colon.* 2000.200.17-18; De Felice (1994), 24-32.

Vitulus and Flacilla by filing records with the municipal government.⁴⁹⁵ The actions of all three parties in this dispute illustrate how the system of self-help and informal justice, which Denis Kehoe and Caroline Humfress have both argued typified dispute resolution throughout the ancient world, could blend individual notions of property ownership. The universal conventions of the surveyors, municipal law and the Roman formulary procedure, observed in the previous two chapters, could be used to solve a problem without violence.⁴⁹⁶

The full importance of this blending and its impact on local judiciaries has been discussed by Julian Dubouloz. Most *civitates*, municipalities and colonies developed legal institutions. The scope was to address such grievances which can be seen in the later dispute arbitrated by Gaius Helvidius Priscus.⁴⁹⁷ In that case, whose resolution is lost, it would seem that an absentee landlord, Tillius Sassius, entered into a dispute with the municipal government of *Histonium*, over what may have been the loss or damage to one or more of the marker-posts. This caused confusion about the boundary between the two properties.⁴⁹⁸ To prove his claim, Sassius forced the municipal administration to produce the record of Gallus' *decretum* as evidence of the actual situation on the ground. It was regrettable that the book was damaged, since that meant a further survey was in all probability undertaken to establish the distance between markers lost in the archival record. Damage of the archival records of this sort may have also played a part in the dispute between the *Patulcenses* and *Galillenses* of Sardinia which is considered below, but there is no proof of it. The main point to be recognised here is that informal processes of dispute resolution, based on the surveyors' craft, could resolve problems outside of any formal legal system, so long as the participants were willing to accept the decision of a private *arbitrator*, who drew on that knowledge base, and that the resulting *decreta* could influence future activities on the land.

⁴⁹⁵ Meyer (2004), 184-185; Edney (2009), 20-22; Chouquer (2010), 120-121; Sudi-Guiral (2010), 331.

⁴⁹⁶ Cuomo (2007), 111-113; Kehoe (2007), 104-105; Maganzani (2007), 12, 16; Humfress (2013), 81, 84-85.

⁴⁹⁷ Dubouloz (2012), 80-82; compare: Chouquer (2010), 121, 138-139 and Metzger (2013).

⁴⁹⁸ Vinci (2008), 11, 13-15, 17; (2009), 267-268.

3.7 A Meeting of Minds: Eubulus and the People of *Daulis*

The two documents just discussed illustrate two points. First, the individual actions could influence the development of a community and community's governing body could in turn both regulate and become involved in the structure and regulation of private land. Second, they show that Roman surveying conventions and administrative forms could be adapted to a non-Roman community, where there was a mixture of Roman and non-Roman citizens through the choices made by individual land-holders.

But an inscribed stele, found in front of a church in the modern village of Dhavlía in Greece, provides the clearest illustration of how surveyors adapted Roman administrative principles and the conventions of their craft to local conditions at the request of people, who were not Roman citizens. The text preserves two documents related to the construction of a temple to a local hero, known as the Archegetes, in a rural district or *pagus* of *Daulis*, called *Tronis*.⁴⁹⁹ The first document is the record of a *decretum* issued by the land surveyor Titus Flavius Eubulus in his capacity as judge in a dispute between two magistrates from *Daulis*, *Zopyros* son of Aristion and Parmenon, son of Zopyros, and one Memmius Antiochus son of Antiochus over four tracts of land sold by the heirs of a man named Cleon. The second document, which postdates the first, is a decree of *Daulis* ordering that a road to the new temple complex be surveyed, and promising Serapis, son of Zopyros, the representative of Memmius Antiochus, financial compensation should the road deprive Antiochus of any land awarded by Eubulus in the prior dispute. The two documents read:

(Side A:) I, T. Flavius Eubulus, judge and land surveyor appointed by Cassius Maximus the proconsul, retained by Valerius Severus, proconsul, (in the affair) between Zopyros son of Aristion and Parmenon, son of Zopyros, and Memmius, son of Antiochos, concerning the disputed places. Having heard from both parties for as long as they wished and having conducted an examination (of the land), and having been ordered to deliver a verdict by Clodius Granianus, the most excellent proconsul, I judge that concerning the field *Dryppios*, which Memmius Antiochos bought for himself from the heirs of Kleon, as I understand from the documents presented to me, 435 Phocic *plethora* belong to Antiochos. Whatever should be found to be more than this, I judge to belong to the city of the people of *Daulis*. Similarly, concerning the field *Euxyleia*, I judge that 430 *plethra* are

⁴⁹⁹ App. 4.28, side B, lines 51-58; Paus. 10.4.10.

Antiochos', the remainder are the city's. Concerning the fields *Platanos* and *Moschotomeai*, I judge that 230 *plethra* are Antiochos', the rest are the city's. I judge that the origin point of the field survey should be established wherever Antiochos wishes in each of the fields *Dryppios* and *Euxyleia*, but in *Platanos* and *Moschotomeai* there will be one survey origin for both fields, with the survey proceeding continuously from the appointed origin, excluding from the surveyed area streams, rough areas, or areas that cannot be cultivated which are over ten *sphyrai*. Present: T. Flavius Eubulus delivered the verdict and affixed his seal, L. Mestrius Soclarus, Kleomenes, son of Kleomenes, Neikon, son of Symphoros, Lamprias, son of Neikon, Zopyros, son of Antipatros, Sosibios, son of Drakon, Neikon, son of Alexandros, Leon, son of Theodotos, Kallon, son of Phylax, Cassius, son of Martianus.

(Side B:) By a decree of the city. The road to the (shrine of the) founder shall be two *kalamoi* wide. They shall jointly engrave the landmarks and boundaries of the survey by the twentieth day of the twelfth month, with us reviewing them when they are engraved.

Concerning the field called *Dryppios*, in accordance with the document presented by Serapis, son of Sopyros the legal representative (of Antiochos) and by the archons for (*Daulis*?) Philon, son of Sosikrates and Damon, son of Zopyros, we judge that if there should be anything lacking from the measurements of four hundred and thirty-five *plethora* in the verdict of Eubulus, that Serapis will have a claim for it from the citizens of the city of *Daulis*. Present: I, Kourrios Autoboulos, have judged and affixed the first seal. I Neikeiphoros, son of Lykomedes, have judged. I, Agasias, son of Teimon, have judged. I, P. Aelius Damoxenus have affixed the fourth seal. I, Eisidoros am fifth. Metrodoros, son of Apollodotos of *Antikyra*. Neikaretos, son of Pistos of *Tithorea*. I Tyrannos, son of Tyrannos have affixed (this) seal. I Akindynos, son of Kallikrates of *Tithorea*. Sextus Cornelius Axiochus. Eunous, son of Epaphras. I, Kalligenes, son of Keoneikus of *Tithorea* have affixed (this) seal.⁵⁰⁰

This dispute, like that involving the grove in the *civitas* of the *Cantiaci*, though embedded in a different cultural context, nonetheless involved a similar argument over the rightful ownership of land. However, here the question was complicated by competing claims against the four fields in *Tronis*, whose names were probably derived from Greek mythological figures, and whose ownership probably involved complicated narratives extending back into the distant past.⁵⁰¹ Since the city planned to construct a new temple complex to their legendary heroic founder, and perhaps to lease some of the property as a source of municipal revenue, such complex mythological connections may have formed part of the community's claim to the property.⁵⁰² However, the land may

⁵⁰⁰ App. 4.28.

⁵⁰¹ Tac. *Ann.* 4.50; Paus. 10.4.7; Chaniotis (2004), 191-193.

⁵⁰² Cic. *Ad Fam.* 13.7.1-2; ILS 5982, lines 5-6, 27-28; IG 9.1.61, side B lines; Patterson (2006b), 185-187.

also have been entailed to the community, if Cleon had taken on the task of completing the temple as a liturgy prior to his death.⁵⁰³ Debts of this sort are likely since Memmius Antiochos, a landlord from outside the community, bought the property from the heirs of Cleon before the city could accredit its claims to the property.

To resolve the disagreement that issued, either Antiochos or the magistrates of *Daulis* appealed to Cassius Maximus, the Roman provincial governor, who contracted with the surveyor Titus Flavius Eubulus to decide who the rightful owner of the property might be. The problem was protracted and lasted beyond Maximus' time in office, so that Eubulus was retained in his post by two subsequent governors before he was at last ordered to produce a verdict. Eubulus, like Julius Victor, the surveyor who resolved matters at *Hypata*, examined all the legal documents available, took a formal tour of examination of each property and concluded that both parties had a valid claim on the land. But, unlike Victor, Eubulus did not split the properties into two more or less equal halves.⁵⁰⁴

Rather, in keeping with the Roman surveyors' notion of equanimity, by which each person should get only what was their rightful due, he seems to have granted a portion of each field to each of the two claimants, based on the value of land in the area and the amount that Antiochos had paid for the property.⁵⁰⁵ He then asked Antiochos to choose a starting point for the survey in each of the first two properties named, the fields *Drypios* and *Euxyleia*, but in the second two pieces of property he allowed only one starting point for both. This meant that in the fields of *Platanos* and *Moschotomeai*, Eubulus retained the titles, but treated the two individual properties as one estate, something that tended to cause endless confusion for surveyors and administrators, when private land-holders did it on their own initiative.⁵⁰⁶

The retention of traditional Greek names in documents that otherwise record the reorganisation of land using local measurements illustrates what might be termed a discrete moment of *mutata forma agrorum*, or a transformation of the landscape, which

⁵⁰³ App. 4.28, side A lines and side B lines; Ael. Erist. *Or.* 50.73, 84; Reynolds (1982), 114 no. 15, lines; Kokkinia (2006), 187-188.

⁵⁰⁴ App. 3.1, 4.28, side A, lines 20-30.

⁵⁰⁵ App. 4.28, side A; Plassart (1970), 55-56, no. 294; Mitchell and Levick (1988), XXXVI.A, XXXVII.B.

⁵⁰⁶ Hyg. *De Gen. Contr.* 2000.96.11-15 = 2010.3.20.

was supposed to convey a sense of continuity with the distant past. This transformation, in both the landscape and the communal memories associated with it emphasised in the text through a total absence of any reference to the original structure of the landscape, or the total size of the estate prior to Eubulus' intervention, was initiated by the leadership of *Daulis* and carried out through the actions of Eubulus and several other surveyors. The motivation for this transformation is provided by Pausanias' account of how all the peoples of *Phocis* made daily sacrifices with offerings of wine and ritual feasting at the temple.⁵⁰⁷ While perhaps an exaggeration, the significance Pausanias ascribes to the temple shows that it was intended not only to renew the civic identity of the people of *Daulis*, but also to reorient their relationship with the other cities of the region and to renew the Phocians' sense of cultural identity under the domination of Rome.

For his part, Eubulus maintained the illusion of continuity by carefully using the archaic place names and a local system of land division, the Phocic *plethora*, rather than the Roman *actus*. However, beyond the use of this Greek measurement, his methodology for carrying out the survey itself was entirely Roman. This is clearest in the stipulations Eubulus set out for the allocation of land in the fields *Platanos* and *Moschotomeai*, where rough terrain, streams and land, which could not be cultivated in an area greater than ten *sphyrai*, would be excluded from the survey, placing it into the juridical category of *ager relictus*, discussed in the last chapter.⁵⁰⁸

The prominent place that the leadership of *Daulis* gave to the judgment of Eubulus and by implication to the Roman administration can be seen in the actions of the ruling they handed down sometime later. A panel of Roman citizens and Phocians from *Daulis* and two other communities provided financial compensation to Antiochos should the road they have ordered surveyed through the field of *Drypios* strip his estates of land granted by Eubulus.⁵⁰⁹ More importantly, they ordered that the survey for the road be undertaken using a similar methodology with the final result inscribed, publicly displayed, inspected and authenticated by the town council in the manner of a

⁵⁰⁷ Paus. 10.4.10.3-4.

⁵⁰⁸ Front. *De Agr. Qual.* 2000.2.32-4.2 = 2005.1.6; *De Contr.* 2000.6.32-8.2 = 2005.2.13; Campbell (2000), 320-321, 345-346.

⁵⁰⁹ App. 4.28, side B; Cels. *Dig.* 8.1.9; Cai. *Dig.* 8.3.8; Iauol. *Dig.* 8.3.13.

surveyor's *forma* and *aes*.⁵¹⁰ This would suggest that Eubulus' treatment of these fields as colonial land, which was subject to allocation and division under the terms of Roman civil law, prompted the people of *Daulis* to adopt the conventions of the Roman surveyors. If this interpretation is correct, then it shows just how a local dispute could transform the landscape of a non-Roman community in decidedly Roman terms under the very direction of its native inhabitants.

3.8 Iberian Law and Roman Procedure: The Resolution of Property Disputes in Early Roman Spain

A document, known as the "*Tabula Contrebiensis*" from Zaragoza-Aragon, demonstrates that the people of *Daulis* were not unique in adapting Roman legal and surveying procedures to the needs of indigenous communities. According to the re-edited text of this inscription, published by John Richardson in conjunction with Peter Birks and Alan Roger in 1984, a *civitas*, called the *Salluienses*, bought a tract of land owned by another *civitas*, called the *Sosinestani*, to build a canal that would bring much-needed water to their own territory in *Hispania Tarraconensis* around 87 BC.⁵¹¹ A third tribal *civitas*, the *Allavonenses*, objected to the sale of the land as well as the Roman-style-survey of the watercourse, and took action to obstruct the construction project. The *Salluienses* apparently complained about this obstruction to the Roman proconsul C. Valerius Flaccus and filed formal charges against the *Allavonenses* for obstruction. Flaccus turned the matter over to the civic council at *Contrebiea* for adjudication, instructing the *decuriones* there to employ formulary procedures similar to those found at the praetor's tribunal in Rome, while rendering a judgment in accordance with local law.⁵¹²

To judge from the questions that the people of *Contrebiea* considered, the *Allavonenses*' objections to the canal rested on two points. First, they contended that the *Sosinestani* did not have any right to sell their land to the *Salluienses* without consulting the *Allavonenses* because private citizens from that *civitas* owned and occupied some of

⁵¹⁰ App. 3.34, line 55-57; 4.28, side B, lines 51-58; 4.42; 4.43; 4.60; 4.61.

⁵¹¹ Birks, Roger and Richardson (1984), 45-46, lines 1-4 and 20.

⁵¹² Birks, Roger and Richardson (1984), 52, 60-64.

the land of the *Sosinestani* through which the canal was laid out by the surveyors.⁵¹³ Second, they argued that even if it was the *Sosinestani* who wished to build and operate the canal, they could not do so in the area that had been marked out for the purpose since private citizens of the *Allavonenses* owned some of the land and the *Sosinestani* did not have the right to use it.⁵¹⁴

Following the directive of Flaccus, the council of *Contrebiea* ruled that the *Sosinestani* were well within their rights to sell land that they owned to the *Salluienses*. They also determined that the *Salluienses*, acting as if they were the *Sosinestani* within the land they had bought, could also build their canal across the private land, owned by members of the *Allavonenses*, so long as they paid each private land-holder a sum of money fixed by an independent board of five.

Like the situation at *Daulis*, the problem in this case came from what might be considered an interstate property transaction, in which people from outside a community acquired land within it. The principal difference was that at *Daulis* a single individual entered into conflict with the community in which the property under consideration was located, while the *Tabula Contrebiensis* presents a complicated situation in which two communities entered into conflict over property owned in a third. Extra territorial enclaves, called *praefecturae* by the Roman surveyors, were common throughout the Roman world and were a frequent source of contention. They came into being under one of three conditions. First, when an individual or civic body acquired land within the territorial jurisdiction of another community or large estate either through lawful sale, *usucapio*, or by right of occupation in war.⁵¹⁵ This was the basis for the *Allavonenses*' interference with the *Salluienses* in the territory of the *Sinistani*. Second, *praefecturae* could be created when extra land within the territory of a Roman colony was either left in the control of its original inhabitants or returned to the control of another community. Third, a Roman colony could be granted control over land within the territory of a distant community.

⁵¹³ Birks, Roger and Richardson (1984), 45-46, lines 3-8.

⁵¹⁴ Birks, Roger and Richardson (1984), 45-46 11-14.

⁵¹⁵ Philos. *Vit. Apol.* 1.38; Front. *De Lim.* 2000.10.34-12.2 = 2005.3.13; Agen. Urb. *De Contr. Agr.* 2000.42.3-20; 2000.44.18-24; Hyg. *De Cond. Agr.* 2000.84.34-86.29 = 2010.2.34-42; Sic. Flac. *De Cond. Agr.* 104.3-7 = 2010.1.8.

The second and third situations will receive some attention in a moment because they play an important part in understanding the regulation of boundaries and the activities of the surveyors in the colonies of *Emerita*, Orange and Arles. What is important to recognise here is that the *Sinistani* faced the complexities involved in constructing aqueducts and canals for the extraterritorial transfer of water. This technical undertaking required either the ownership of land in other communities or else the establishment of servitudes allowing one party to make use of another's property.⁵¹⁶ All of these features reflect a highly developed concept of law, as well as property ownership, which may have been developed independently by the indigenous communities of *Hispania Tarraconensis*, but it unquestionably fit with the Romans' own socio-juridical world view and was ripe for the activities of the land surveyors.

3.9 Interstate Boundaries and Continuity at *Histria*

When one *civitas* owned land within the territory of another, it introduced problems in interstate property demarcation and the organisation of the provincial landscape. Serafina Cuomo, drawing on the work of Susan Alcock, has suggested that provincial administrators in the Greek-speaking provinces privileged past traditions of property-ownership and boundary demarcation to a greater extent than did their counterparts in the Western or African provinces.⁵¹⁷ Her suggestion that the Romans tended to preserve the boundaries of Greek cities and pay attention to the views and sensibilities of Greek citizens over those of other cultural backgrounds is quite plausible, given the special place Greek culture occupied in the Roman imagination. Yet, the argument needs to be nuanced since both Greek and Latin inscriptions from other parts of the Empire show that generalised tendencies do not always hold true.

Two fragmentary steles containing a bilingual set of administrative documents, published by Vasile Pârvan during the First World War (Fig. 3.4), shed some interesting light on the ways in which the Romans established and then maintained interstate boundaries following the military occupation of a region.⁵¹⁸ The inscriptions record five letters, written in Greek to the people of *Histria* by three Roman governors of *Moesia*

⁵¹⁶ Front. *De Aqu. Urb.* 6.5; 66.1; Ulp. *Dig.* 8.3.1pr; Leveau (2012), 83, 86-87, 101; Lewis (2012), 151-156.

⁵¹⁷ Alcock (1997), 106-112; Cuomo (2007), 126-127.

⁵¹⁸ Pârvan (1916), 558-593, no. 16; Elliott (2004), 87-93.

between the reigns of Claudius and Hadrian. These letters are framed by a Latin *determinatio* for a survey of *Histria*'s civic territory and the final *decretum*, issued in a dispute between the people of *Histria* and Charagonius Philopalaestrus, tax-collector for the Thracian coast. The Greek letters, which are arranged so that the most recent is at the top of the stele and the oldest towards the bottom, document the civic council of *Histria*'s petitions to the Roman administration for the imperial recognition of their ancestral boundaries, their status as an independent city, and their right to fish in the mouth of the Puce River, a tributary of the Danube, without being taxed.⁵¹⁹

This traditional diplomatic exchange between a particular provincial constituency and the imperial administration shows that the people of *Histria* did not assume that each successive governor, sent to the province, would automatically continue to recognise either their civic status or the boundaries that they and their ancestors had claimed. The Roman administration, for its own part, does not seem to have ever considered surveying the boundary to check the accuracy of the council's territorial claims. Nor do any of the emperors from Augustus to Hadrian seem to have ever seriously considered revoking *Histria*'s status as a free city. Only when the tax collector Charagonius vigorously accredited his right to tax the Histrians, did the governor Manius Laberius Maximus actually have the territory owned by *Histria* formally delineated by Roman surveyors.⁵²⁰

The text of the *determinatio* at the start of the inscription is too fragmentary to reconstruct its full contents, but the boundary follows the elliptical pattern for civic boundaries, found in the writings attributed to Hyginus, with *flexus* following mountain ridges and rivers and *rigores* connecting points across open country.⁵²¹ The inscription only mentions a few features of the city's internal organisation, making it hard to reconstruct patterns of land-usage around the urban core. However, one of the letters in the collection, written to the civic council by one Flavius Sabinus, mentions that the people of *Histria* have documentation showing that they have the right to exploit timber from a forest within an unspecified subsection of their territory free of taxation.⁵²²

⁵¹⁹ Elliott (2004), 89, no. 16.3, lines 26-27.

⁵²⁰ Elliott (2004), 91, no. 16.7.

⁵²¹ Hyg. *De Cond. Agr.* 2000.78.21-32 = 2010.2.1-2; Elliott (2004), 88, no. 16.1; Guillaumin (2010), 79-80.

⁵²² Elliott (2004), 89, no. 16.3, lines 24-26.

Archaeological and epigraphic evidence from other parts of *Moesia*, *Lycia* and *Asia Minor* suggests that cities in these provinces commonly held large tracks of rural land that were parcelled out into a variety of different types of administrative subdivisions, which frequently contained temples, *villa* estates or *vici*.⁵²³ Locally defined sub-districts of this sort, which varied in size and structure from city to city, were very much in keeping with the Roman understanding of land allocations. The remarkable feature of the allocations in this instance is not their apparent structure or age, but rather their extent. According to the surviving text of the *determinatio*, the people of *Histria* claimed a substantial part of the province for themselves. The total distance for the perimeter around *Histria* listed in the inscription was the incredible distance of 516 Roman miles. While measurements were never made to the same exact standards as in the present, the Roman *mile passus* was approximately equal to 1.48 kilometres.⁵²⁴ Applying that approximation, the boundary at *Histria* would have been roughly 763.7 kilometres enclosing an area of 46,447.6 square kilometres. Roman surveyors had the technical ability to enclose such a large area, but it is very unlikely that the Roman administration would have allowed an independent community within the borders of the empire to claim so much land. The evidence from the photographs of the inscription (Fig. 3.4) and the text of the transcription suggests that Pârvan copied the numbers off the stone correctly.⁵²⁵ A likely explanation for the anomalous distance figure Pârvan reported in the text is that the stone mason copying the text of the *decretum* misread either an L or a C for the letter D. If the number was supposed to read CXVI, then the perimeter around *Histria* at 116 miles or 171.7 kilometres would have enclosed an area of 2,436 square kilometres. If the number in the text was supposed to read LXVI, then the perimeter around *Histria* at 66 miles or 97.7 kilometres, would have enclosed an area of 759.5 square kilometres. The second of these options, though still representing a wide expanse of territory, would be compatible with the enclosed area of land that other powerful cities such as *Antiochia* controlled during the second century AD.⁵²⁶ More importantly, whatever the Romans were willing to accept, any ancestral territorial boundary claimed by the people of *Histria* would by necessity reflect only the land which the city was able to secure for itself as a *polis* through its own military and diplomatic initiatives, following its foundation in the seventh century BC. It is hard to

⁵²³ App. 4.17, 4.27; Onur and Alkan (2011), 67-71.

⁵²⁴ Smith (1851), 1025; Geus (2014b), 147-148.

⁵²⁵ Compare: Pârvan (1914); Elliott (2004), 88, no. 16.1.

⁵²⁶ Compare: Romano (2006), 68; De Giorgi (2011), 138.

see how the people of *Histria* maintained control over almost 800 square kilometres of land, let alone the higher figure.

Regardless of the actual area controlled by the people of *Histria*, Laberius Maximus, in resolving the situation between the city and Charagonius, illustrated several key points of Roman policy toward long-established civic centres. First, the Roman administration accepted the civic-bodies declaration concerning its ancestral territorial jurisdiction. As with the cases from *Daulis* and *Histonium* discussed above, the Roman administration's choice to accept such a declaration rested upon the existence of prior documentation supported by material evidence on the ground. The Romans only surveyed such boundaries when someone presented a challenge to their validity or to the veracity of either the documentation or to the monumental features of the landscape establishing the physical existence of the boundary line itself. Finally, even when Roman administrators had a pre-existing boundary-line surveyed to resolve a dispute, years sometimes passed before surveyors undertook the fieldwork necessary to reaffirm the boundary's course in order to make the final *decretum* in a dispute binding.⁵²⁷

Much of the administration's willingness to accept such declarations came from its inability to check the boundaries and property delineations of each and every community in the Empire. However, it also stemmed from the fact that the administration's own needs were serviced not by civic territorial boundary lines, but by the provincial boundary lines, tax districts and juridical *conventus*, superimposed onto a region's landscape when each province was created, a process explored in the next chapter.

3.10 Continuity and Control in *Africa Proconsularis* and *Mauritania Caesarensis*

While the document just examined comes from a predominantly Latin speaking province, there can be little question that it was produced by a Greek-speaking community. It is important to highlight that the production of monumental archives,

⁵²⁷ Compare: App. 2.7, 4.27, 4.41; SEG 39.577; Paus. 4.1.1; 4.4.2; Tac. *Ann.* 4.43; Elliott (2004), 91, no. 16.6, lines 59-61.

preserving important administrative documents in stone, which forms the majority of available evidence on large-scale surveying projects, was a cultural habit confined to the Greek-speaking population of the eastern provinces. In Africa and the west, such monuments were created in bronze or wood, which have long since been lost,⁵²⁸ and tend to be quite laconic. As Serafina Cuomo herself has remarked, the evidence for boundary disputes and authoritative demarcations in these regions tends to come from laconic boundary markers. Their text is so abbreviated that in many cases only someone very familiar with the epigraphic conventions of a given region would have known what the letters on the stones meant.⁵²⁹ This makes it very difficult to know if the Romans followed the same conventions of property adjudication and boundary preservation in non-Greek communities.

Two sets of documents from the reign of Trajan have been put forward as evidence for arbitrary boundary-marking and colonial oppression. The first set of markers record the authoritative demarcation of property between the *Musulamii* and several neighbouring constituencies. The second set of documents comprises quadrilateral marker-stones, reporting the centuriation of several *civitates* near the modern site of Henchir Chenah in the valley of the Bled Segui in Tunisia. However, neither set of stones provides any indication as to why the demarcations were carried out. Moreover, it is important to consider both cases in light of two crucial historical events. One event was the insurgency of the Roman deserter Tacfarinas and his allies from the *Musulamii*, which inflicted widespread damage on crops, livestock, boundaries and buildings throughout *Africa Proconsularis* and *Mauritania Caesariensis* between 18 and 23 AD.⁵³⁰ The other is the grain famine which struck Egypt at the start of Trajan's reign in 99 AD.⁵³¹

Both of these instances probably influenced the two series of quadrilateral markers, found around Henchir Chenah and published by Pol Troussset in 1978.⁵³² The first set, recording allocations ordered by the proconsul Vibius Marsus around 30 AD, consists of markers inscribed on two sides with grid notations for a Roman survey. It

⁵²⁸ Bodel (2001), 3-4, 23; Eck (2004), 9-10; (2009), 82-83, 94-95; Lavan (2013), 221, 227.

⁵²⁹ App. 4.58; CIL 8.7086, 8.7087, 8.7089, 8.9791, 8.19329; Bodel (2010), 108-109.

⁵³⁰ Tac. *Ann.* 3.20; 4.23-24.

⁵³¹ Plin. *Pan.* 30-32; Bennett (2000), 164; Lavan (2013), 168-172.

⁵³² Troussset (1978), 141; Briand-Ponsart and Hugoniot (2006), 52-54; Mattingly (2011), 150.

follows a 200 km long base-line running from the fortress of Ammedara to the area of the Chott Djerid/Fedjedj, which covered an area of 39.1 by 49.7 km, centred at the top of Jebel dou el Haneiche.⁵³³ The reasons for this vast centuriation grid remain unclear, but since the markers make it clear that the *civitates* retained their political and juridical independence, it is likely that the demarcations were intended to re-establish stability for taxation in a region, whose traditional system of land-tenure had been badly disrupted by the war.⁵³⁴ In this respect, it is important to note that centuriation was not required for establishing taxation, but provincial lands occupied in war which were subject to taxation, *agrum arcifinium vectigalem*, and were to be enclosed by stone markers and a centuriated grid, though some surveyors felt that *striga* and *scamna* should be employed to distinguish this sort of survey from a colonial foundation.⁵³⁵ More importantly, perhaps, the division and allocation was also intended to settle veterans either in self-regulating *praefecturae* or, as seems more likely from the inscriptions, on allocated lands subject to the jurisdiction of the indigenous *civitates*.⁵³⁶

While this program of centuriation and integration might have provided a framework for the intensification of agriculture, transforming life in the Bled Segui, as Bruce Hitchner and David Mattingly have argued, two crucial factors could have limited its impact on the largely pastoralist population of the region.⁵³⁷ First and foremost, as Christopher Tilley illustrates in his article on walking in the landscape, agriculturalists, pastoralists and hunter-gatherers interact with and inhabit the landscape in quite different ways.⁵³⁸ While the hunter-gatherer takes the world with him, walking at the centre of a place filled with a meandering medley of sensations and experiences that shape memory and knowledge, the semi-nomadic pastoralist walk or ride between distant contrastive landscapes, held together by seasonal migration routes opening out the world into cyclical circular patterns.⁵³⁹ Both of these systems of inhabiting and structuring the landscape contrast sharply with the activities of the Roman surveyors,

⁵³³ CIL 8.22786A-I; AE 1905.0181, 1997.1588; Troussset (1978), 141; Briand-Ponsart and Hugoniot (2006), 52-54; Mattingly (2011), 150.

⁵³⁴ Plin. *Nat.* 5.4.30; CIL 8.22786E.

⁵³⁵ Hyg. *De Cond. Agr.* 2000.82.15-22 = 2010.2.21-22; *De Const. Lim.* 2000.160.22-28 = 2005.20.1-3; 2000.162.1-12 = 2005.20.6-12.

⁵³⁶ Hyg. *De Cond. Agr.* 2000.82.23-30 = 2010.2.23-24; 2000.82.32-84.6 = 2010.2.26-27; Sic. Flac. *De Cond. Agr.* 2000.118.3-6 = 2010.2.56; *De Quaes. Agr.* 2000.118.26-34 = 2010.3.1-2; 2000.120.9-17 = 2010.3.7-8; 2000.132.22-25 = 2010.4.62.

⁵³⁷ Troussset (1978), 137-140; Hitchner (1994), 32-36; Hilali (2010), 38-40; Mattingly (2011), 150-152.

⁵³⁸ Tilley (2012), 22-26.

⁵³⁹ Ingold (2007), 75-78; Tilley (2012), 24.

who looked at the landscape and structured it by walking to create curving and straight lines of travel demarcating the use of places.

A second factor, closely tied to the problem of local world view, is that the Roman administration depended upon local cooperation for the development of land, which was not directly owned and controlled by the emperor himself. As an inscription discovered in 1919 near the bank of the Trebisnjica River outside Nikšić in modern day Montenegro shows, the restoration of bridges and boundaries damaged by neglect, floods or through other natural disasters depended upon private land-holders or their representatives. They usually contracted with surveyors to see the work was done without much active oversight from the small number of imperial officials in the provinces.⁵⁴⁰ As will be seen, some *civitates* took the trouble to do this in the pursuit of their own interests. However, unless Roman veterans living amongst the population compelled the local leadership to maintain this sort of engagement with Roman administrative practice, most pastoralist communities probably would not have bothered even for the sake of raising grain to pay their taxes.⁵⁴¹

Another set of marker stones, which were set (*posuita sunt*) in position between the *Nybgenii*, one of the *civitates* named on the markers set up by Marsus, and the *Tacapitani* in accordance with a *forma* sent by Trajan, may be an imperial demarcation in response to this sort of local indifference, since there is no mention of a *iudex* or the *decretum* indicative of a boundary dispute.⁵⁴² Moreover, another nearly identical marker recording a similar demarcation between the *Thabborenses* and the *Thimisuenses* by a centurion of the thirteenth urban cohort during the same period suggests that the demarcation for the *Nybgenii* was not just an isolated exercise in firming up a local system of land division, but rather, part of a larger project.⁵⁴³ There are no historical records to show what that project may have been. However, the use of a *forma*, which may have been derived from documentation produced by Marsus to monumentalise an interstate boundary in centuriated land, suggests that Trajan and his administrators were concerned with establishing continuity with the past and stability for the future. The

⁵⁴⁰ Sergejevski (1964), 93-94; Campbell (2012), 75-81, 84-90, 98-102; Kolb (2013), 112.

⁵⁴¹ Eck (2004), 11-12, 15-16; Briand-Ponsart and Hugoniot (2006), 74-76; Caballos Rufino (2011), 187, 189-191, 193; Haensch (2011), 101-102; Gordón Peral (2011), 210-212, 218-219.

⁵⁴² App. 4.54, 4.57.

⁵⁴³ App. 4.55.

grain famine just mentioned provides an ideal context, since the emperor would be interested in creating an alternative bread-basket in the event that Egypt's crops failed again in the future. The regulation of land-use was a crucial first step toward stimulating agricultural production in a region where, as Denis Kehoe and David Mattingly have both argued, it depended upon a cooperative effort between landowners and tenure farmers.⁵⁴⁴

This need to regulate the use of agricultural land should also be seen as the impetus behind the establishment of boundaries between the pastoralist community of the *Musulamii* and their neighbours. Rather than being an attempt to create a sort of tribal reservation, as some scholars have suggested, each of these authoritative demarcations should be seen as an attempt to regularise the use of *ager occupatorius*, taken by private Roman settlers during the war with Tacfarinas and the pastoral or agricultural land of indigenous *gentes*.⁵⁴⁵ The point is clearest in the inscription regulating the boundary between the *Musulamii* and the estate of a woman named Valeria Atticilla in 106 AD.⁵⁴⁶ The inscription invokes the authority of the emperor, names the parties separated by the boundary, but does not mention a dispute. Instead, the text simply reports the distance measurements for a right-angled perimeter, measuring 90 by 716 feet reflecting irregular dimensions of land without the application of centuriation.

Whether the *Musulamii* lost on this transaction or not it is impossible to say, but as was discussed in the previous chapter, every boundary was delineated in the presence of all parties whose land was involved. If the *Musulamii* understood the system of proofs involved with Roman surveying, then it is possible that they may have actually gained some land from one or more of their neighbours, since at least one of the boundaries was delineated multiple times. Sheila Ager has made a strong case for cities under the authority of the Romans, such as *Melitaia* in Thessaly, to have manipulated the Roman legal system to expand their territory at the expense of neighbouring communities.⁵⁴⁷ To be sure, the epigraphic evidence she presents applies to just one city

⁵⁴⁴ Kehoe (2007), 59-62, 64, 67, 7-72, 76; Mattingly (2011), 151-155.

⁵⁴⁵ App. 2.49, 2.50, 2.51, 2.52, 2.53; AE 1940.0070; Briand-Ponsart and Hugoniot (2006), 52-54; Mattingly (2011), 150.

⁵⁴⁶ App. 2.54.

⁵⁴⁷ Ager (1989).

in the late Hellenistic period, and there may be other possible readings for some of the inscriptions presented by Ager in her study. Nonetheless, the potential for one city to gain territory and power at the expense of others by taking advantage of the Roman administration's unfamiliarity with local law or politics should be born in mind when considering inscriptions, such as those monumentalising the boundaries between the *Musulamii*. As other inscriptions considered below show, it was crucial for communities, who historically lost a war with Rome, to master the arts of Roman law and come to terms with the Roman surveyors in order to safeguard their interests.

3.11 Colonies, Compulsion and the Transformation of the Provincial Landscape

In considering the Trajanic markers from Tunisia, centuriation and the choice of indigenous *gentes* to engage with Roman surveyors, it is important to consider the impact of colonial foundations and the forced relocation of collective populations. For many indigenous *gentes* this violent and disruptive form of surveying was the first and sometimes most significant contact with Roman surveyors. As will be discussed further in the next chapter, the creation of colonies was frequently part of the Romans' consolidation of control over a region. In the majority of cases, a colony was created as a new community built out of the ashes of an indigenous settlement, whose population was wiped out or relocated elsewhere by the Romans.⁵⁴⁸ *Lingum* in *Britannia*, *Bracara* in *Lusitania* and *Colonia Iulia Flavia Augusta Corinthiensis* in *Achaia* are all examples of this practice, which stimulated discourse and trade between indigenous communities and the Romans.⁵⁴⁹ In some cases, such as at *Arausio*, *Forum Iulium* and *Emerita*, the land for the new city was taken from a community, which continued to exist in the shadow of the colony.⁵⁵⁰

The impact that this practice had on existing communities varied greatly with the foundation of some colonies in Italy, occupying so much land that they even incorporated parts of a pre-existing city's urban fabric into their *pertica* or assigned

⁵⁴⁸ Orejas, Ruiz del Arbo and Sastre (2006), 195-197.

⁵⁴⁹ Jones (1999), 101-104; Romano (2006), 61-62; Carvalho and Azevedo Mendes (2010), 156-157; Reis Martines and Carvalho (2010), 283-285.

⁵⁵⁰ Christol (2006), 89-90; Leveau (2010), 57-61; Edmonson (2011), 31, 33, 39; Dubouloz (2012), 80-86.

lands.⁵⁵¹ In rare cases, a colony was created out of an already inhabited Roman *castra* such as at Amadara, or in the midst of a thriving civic centre such as at Antiochia.⁵⁵² Because each colony was regulated by Roman law and specifically created by the surveyors to provide legionary veterans and civilian colonists with *fundi*, the inclusion of an existing indigenous community within the physical territory of a colony created a dynamic internal discourse about power and social identity, which was quite different from anything seen in the *civitates* or municipalities.⁵⁵³

To fully appreciate this distinction, it is necessary to look at the impact of surveying on the internal organisation of a colony and its impact on the indigenous population. A selection of inscriptions, along with archaeological evidence, shows that while the colonies were intended as Roman settlements and had a profound impact on the landscape, they were not, as several scholars have recently remarked, intended to consciously transform the culture of the indigenous population in order to incorporate them into the fabric of Roman society.⁵⁵⁴ Two of the inscriptions, illuminating the political gradation and social complexity of centuriation at both a proper colony and in a *praefectura*, are the Arausio and Lacimurga tablets, both of which were introduced in the previous chapter.⁵⁵⁵ One of the other two inscriptions is a bronze tablet from near the village of *Esterzili* on the island of Sardinia, which preserves the text of a *decretum* in a property dispute between the *Patulcenses Campani* – a Roman colonial foundation – and the indigenous *Galillenses*.⁵⁵⁶ The last text considered in this section is an honorific dedication, found near Gémenos in France, which details the political relationship between the *pagus Lucreti*, attached to the *Colonia Iulia Paterna Arelate*, and the *civitas* of the *Arelatensies*, within whose boundaries the *pagus* was actually located.⁵⁵⁷

As was discussed in the last chapter, the Arausio and Lacimurga tablets are the surviving fragments of two cadastres reflecting the *aes*, which was the monumental

⁵⁵¹ Haynes (2013), 95-107.

⁵⁵² Crummy (1999), 89-91; Briand-Ponsart and Hugoniot (2006), 59; De Giorgi (2011), 135-137.

⁵⁵³ Aul. Gel. NA. 16.13.8-9; Cic. *De Leg. Agr.* 1.22; Suet. *Jul.* 42; App. *BP.* 20.136; Hyg. *Const. Agr.* 2000.84.19-22 = 2010.2.30; Hyg. *Const. Lim.* 2000.140.20-142.11 = 2005.5.1-9.

⁵⁵⁴ Compare: Mattingly (2011), 150-152; Haynes (2013), 349-352; Lavan (2013), 245-248.

⁵⁵⁵ Gorges (1993), 21-23; Chouquer and Favory (2001), 43-48, 226-228; Leveau (2010), 59-62; Edmonson (2011), 35, 39.

⁵⁵⁶ App. 4.60.

⁵⁵⁷ App. 4.62.

publication of the *forma* and its *commentaria*. Each *forma* simultaneously recorded the relationship between different physical features within the centuriated landscape, created by the surveyors and situated them inside a geometrically arranged theoretical framework.⁵⁵⁸ This framework was used to ascribe to each feature or section of land in the settlement a social and political identity created using a set of abbreviated tags.⁵⁵⁹ The interpretation of these tags, like the abbreviated notations on boundary markers, formed part of the specialised knowledge of the surveyors. Four tags, whose meaning can be inferred from the writings of the Roman land surveyors, are important here. As Julien Dubouloz has recently argued, they create a stratified landscape of privilege and exclusion, illustrating that not everyone living within a colony's territorial jurisdiction was a part of the community subject to its liturgies and jurisdiction.⁵⁶⁰ These categories include: *agri ex tributo soli*, *agri excepti*, *agri concessi*, and most importantly, *agri reddit*.

In most colonial foundations, land was theoretically distributed equally to all either by sortation or by direct assignment based on preselected criteria, such as military rank.⁵⁶¹ However, in mixed communities such as *Emerita* or Carthage, where soldiers and civilians who may not even have possessed Roman citizenship prior to the *deductio* were settled alongside one another, the imperial administration had to find a system of reward to satisfy soldiers with a particularly distinguished record of service and the wealthiest colonists.⁵⁶² In keeping with Brian Campbell's observations concerning the importance of Augustus in the development of surveying practice, it would seem likely that he developed the first two categories of land definition just mentioned to specifically reward colonists who enjoyed imperial favour. According to the authors in the *Corpus Agrimensorum*, the colonial *deductor* could grant a *fundus* which was *exceptus* or held by the possessor as part of the territory of the *Res Publica Romana*, so that it was not subject to taxes or liturgies levied by the colonial administration.⁵⁶³ A

⁵⁵⁸ Guillaumin (1994), 289; Roby (2014), 20, 23-26, 29-30.

⁵⁵⁹ Piganiol (1962), 49, 55-56, 103-104, 172, 202; Campbell (2000), 395-401; Chouquer (2010), 143, 145.

⁵⁶⁰ Dubouloz (2012), 79-81, 92-93, 98-100, 114-115.

⁵⁶¹ Hyg. *De Lim.* 2000.78.13-17 = 2010.1.11; Hyg. *Const. Lim.* 2000.158.3-5 = 2005.14.8; Sic. Flac. *De Div. et Ass.* 2000.120.33-35 = 2010.4.5; Liv. 35.9.5-9.

⁵⁶² App. *BP.* 20.136; Str. *Geog.* 3.2.15; Front. *De Contr.* 2000.6.36-8.2 = 2005.2.13; Hyg. *Const. Lim.* 2000.136.28-31 = 2005.1.26.

⁵⁶³ Hyg. *Const. Lim.* 2000.154.23-33 = 2005.13.3-8.

slightly less exalted honour was for the *deductor* to grant a colonist a *fundus*, which was *ex tributo soli* or exempt from payment of property taxes.⁵⁶⁴

Alongside these two sets of privileges, the Roman administration maintained another set of distinctions, which singled out individuals and small groups of indigenous possessors for special treatment. These distinctions may have been intended to mitigate the disruption and anger which the Roman administration was all too aware colonisation caused.⁵⁶⁵ One policy, which has been attested in Italy and at eastern cities such as *Antiochia* and *Epirus*, was for the *deductor* to pay financial compensation to evicted land-owners and incorporate the existing civic structures of the community into the monumental centuriated landscape of a new imperial city.⁵⁶⁶

If the *deductor* wished to return land to those who held it prior to the *deductio*, he could do so in several ways. One way was for the *deductor* to reassign *subseciva*, which, as Brian Campbell and Julien Dubouloz have both argued, remained in the hands of the emperor and could freely be allocated to the colony as public forest or pasture land, sold to private land-holders, or reassigned to the communities from which it was taken.⁵⁶⁷ Another option was for a *deductor* to grant a *fundus concessus*, which was an extra-legal allocation to anyone containing more land than the colonial charter made available in a single allotment.⁵⁶⁸

A further practice, attested on the Arausio tablets, was for the colonial *deductor* to make grants of *agri redditu prior possessum* to individual land-holders.⁵⁶⁹ The exact meaning of *agri redditu* remains uncertain, but Michael Crawford and Brian Campbell have interpreted stating that land was returned to an individual, who established themselves as *vetus possessor* in the eyes of the Roman administration.⁵⁷⁰ The author of the *De Conditionibus Agrorum*, attributed to Hyginus, certainly establishes *agri redditu* as a legal concept. In fact, he states that land taken in war by the Roman people, which

⁵⁶⁴ Piganiol (1962), 55-56; Campbell (2000), 319, no. 6.

⁵⁶⁵ App. *BC*. 2.94; Cic. *Sull.* 60-62; Licin. 36.36; Plin. *Nat.* 3.52; Tac. *Ann.* 14.31-32; Cass. Dio 48.9.4; Virg. *En.* 1.70-71; 9.28; Prop. 4.1.130; Hor. *Sat.* 2.2.112-36.

⁵⁶⁶ Sic. Flac. *De Div. et Ass.* 2000.124.6-10 = 2010.4.20; Bowden (2011), 107-108, 110, 112; De Giorgi (2011), 136-139.

⁵⁶⁷ Campbell (2000), 320-321, 344-345; Dubouloz (2012), 93, 95, 115.

⁵⁶⁸ Hyg. *Const. Lim.* 2000.154.23-33 = 2005.13.3-8.

⁵⁶⁹ Piganiol (1962), 103-104, 172, 202.

⁵⁷⁰ Crawford (2002), 153-155; Campbell (2000), 362, no. 22.

was not allocated to veteran settlers because it was in excess of what was required, was rented out for extended periods. However, it would sometimes be restored to a named individual or individuals, if they could prove that they held prior title to the land in a Roman court.⁵⁷¹

The more common practice, however, seems to have been for a *deductor* to simply return allocated plots to prior possessors at his sole discretion.⁵⁷² Since the return of such lands did not always satisfy either colonists or the indigenous land-holders, room was left in the allocations for possessors to trade sections of land, so that they could form *fundi* containing both agricultural and forest or pastoral land. The principal distinctions between the two conditions was, in part, that one was undertaken after the fact, while the other was done at the moment of creation, which may have involved the civic status of the land-holder. Individuals who proved title after the fact may have gained a legal position within the colony, as those who bought land in the municipalities did.

But, unless there was a clause in the colonial charter or an imperial edict, which provided for *prior possessores* to be subject to the liturgies and jurisdiction of the colony, *veteri possessores* were subject to the taxes and liturgies of their home community.⁵⁷³ It was undoubtedly the existence of constitutional clauses placing *veteri possessores* under the jurisdiction of colonial magistrates, which prompted Siculus Flaccus to observe that, while a *deductor* frequently returned land to the indigenous inhabitants of a community when founding a colony, there were cases in which jurisdiction over that land was not returned along with the right of occupation and use.⁵⁷⁴

While both Andre Piganiol and Julian Dubouloz have used the tag of *iugera Tricostini reddit*, found on the Arausio tablets, to argue that the Roman administration returned land as a benefaction to provincial *gentes*, such as the *Tricostini* as well as to Italians and Roman citizens such as those at Verona, the grant was perhaps a mixed

⁵⁷¹ Hyg. *De Cond. Agr.* 2000.82.31-84.6 = 2010.2.25-27.

⁵⁷² Hyg. *De Cond. Agr.* 2000.84.19-22 = 2010.2.30; Hyg. *Const. Lim.* 2000.160.2-6 = 2005.18.2; Sic. Flac. *De Div. et Ass.* 2000.122.27-32 = 2010.4.15-16; 2000.126.34-128.5 = 2010.4.36-37.

⁵⁷³ Agen. Urb. *De Contr.* 2000.42.3-9; Hyg. *De Cond. Agr.* 2000.84.23-33 = 2010.2.31-33; Dubouloz (2012), 104-108.

⁵⁷⁴ Sic. Flac. *De Div. et Ass.* 2000.130.36-132.6 = 2010.4.54-57.

blessing.⁵⁷⁵ To be sure the allotments within a colonial *deductio* returned to *veteri possessors* from a *civitas*, such as the *Tricostini*, would have been recorded on the *forma* and in the *commentaria coloniae*, protecting their legal status under Roman law, as Julian Dubouloz has argued.⁵⁷⁶ But there were distinctly different rates of taxation between colonies and *civitates*, which along with cultural differences and competing territorial jurisdictions may have produced serious tension and contention between the *veteri possessors* and colonists.⁵⁷⁷

Yet, three factors seem to have mitigated this problem. First and foremost, the Roman administration only granted land within the colony to *veteri possessores*, who were already fully conversant with and accepting of Roman law and culture.⁵⁷⁸ Secondly, the Roman administration depended upon bonds of obligation created by these land grants to stimulate participation in the colonial judicial system, where multiple legal systems could operate in tandem under a foundational charter, which was crafted to fit the local situation.⁵⁷⁹ Third, the surveyors presented a monumental *aes*, depicting the landscape experienced by individual colonists and transformed through their craft, before a united audience of imperial officials and the colonists themselves, to create a sense of community.

While the authors in the *Corpus Agrimensorum* only discuss the *aes* as a public reference for the resolution of property disputes, a role amply illustrated by the inscription from Sardinia considered below, its role as a focus for the discursive formation of a colony's collective identity can be deduced from several pieces of evidence. First, Siculus Flaccus, when discussing *ager occupatorius*, makes the observation that there were no *formae* or *aeres* for this category of land, since it was not held by virtue of a survey, but many possessors of this type of land nonetheless produced *formae* of their own and their neighbours' holdings.⁵⁸⁰ This shows that landholders considered the *forma* and its publicly displayed *aes* to have been a significant declaration of both ownership and position within a community.

⁵⁷⁵ Piganiol (1962), 30-32, 54; Cavalieri Manasse (2007), 27-28; Dubouloz (2012), 98-99.

⁵⁷⁶ Dubouloz (2012), 96.

⁵⁷⁷ Dubouloz (2012), 100-105, 121-122.

⁵⁷⁸ Piganiol (1962), 30-32, 54-55; Christol (2006), 90-91; Dubouloz (2012), 99, nos. 122-128 above.

⁵⁷⁹ Arnaud (2003), 22; (2006), 69, 73-75; Dubouloz (2012), 104-105, 108, 117-118; Humfress (2013), 79-82; Lavan (2013), 157-161, 165-166, 219-222.

⁵⁸⁰ Sic. Flac. *De Cond. Agr.* 2000.104.29-33 = 2010.2.2.

This individual interest in displaying the boundaries of private property was perhaps a natural outgrowth of the system of negotiated boundaries and property identity, seen in the cases from the *Cantiaci* and *Histonium* considered above. More importantly, this interest was clearly echoed on the marble fragments of *aeres* recorded by Mommsen at Rome, where Augustus had the names of individual possessors, inscribed for each delineated property along with the quantity of water allocated to each *fundus*.⁵⁸¹ Like the Arausio tablets, which display two or possibly three consecutive deductions carried out at the order of the emperor, they were created to monumentalise the ideological control of the imperial administration over the relationship between individuals and the land at a formative moment for both.⁵⁸² As has already been discussed, surveyors or their assistants publicly hung up the *aes* high on the wall of a building to ritually conclude a colonial *deductio* and reaffirm that the community was fully constituted in accordance with the terms of its charter. The text from *Daulis* discussed above partially shows the importance which civic magistrates placed in this ritual display of a surveyed territory. It validated and formed public space in the consciousness not just of the community but in the minds of all those who might experience the space from outside.

However, it is clear from passages in the *Corpus Agrimensorum* that much of the *aes*'s contents was presented in obscure abbreviations best known to the surveyors, and in a position from which it is doubtful that even the most literate members of the community could have read the text.⁵⁸³ This would tend to suggest that, while people did refer to the *aes* in the course of litigation, the real power of the *aes*, like most publicly displayed legal documents, was in the symbolic legibility of its contents, rather than its physical accessibility.⁵⁸⁴ Both Jennifer Trimble and Richard Talbert have suggested that monumental diagrams of geometrically structured space functioned as articulations of power relationships, political hierarchies, cultural practices and social identities, which were embedded in a specific location.⁵⁸⁵

⁵⁸¹ App. 4.45, 4.47, 4.66; Bruun (1991), 56, nos. 48, 70, 87; Rodriguez-Almeida (2002), 24-26, 29, 31-34; Najbjerg and Trimble (2004), 578.

⁵⁸² Woolf (1996); Bodel (2001); (2010); Christol (2006), 88-90.

⁵⁸³ Gorges (1993), 15, 17; Campbell (2000), 394-396; Arnaud (2003), 14-15; Bodel (2010), 107-108.

⁵⁸⁴ Kokkinia (2006), 184, 186; (2009), 193; Eck (2009), 90-95; Bodel (2010), 209-210.

⁵⁸⁵ Trimble (2008), 67-70, 95-97; Talbert (2012b), 172-177.

The associations between historical events, significant within a particular cultural matrix, social position, political power and depicted locations, were activated through discourse prompted by the shared experience of viewing an inscribed monument in a significant location. Neither Trimble nor Talbert explain the mechanics behind this system of visual comprehension and confine their application of the theoretical framework to the *Forma Urbis Romae*, their suggestion that communal memories of significant places embedded in the *forma*'s union of text and image has much in common with arguments put forward by Michael Squire for the ways in which elite viewers interpreted what might be termed annotated or inscribed art. Squire has argued that viewing art in the Hellenistic and Roman periods demanded that a viewer draw social meaning from the relationship between literary text and graphic or plastic subjects, the composition's physical location and any absent cultural references, implied by the work which were not present before uttering a verbal response to the composition in the presence of other viewers.⁵⁸⁶

This multi-layered social concept of viewing, so different from anything in the modern world, was deeply embedded in the popular Platonic and Stoic philosophies of the period. Yet, it was not out of reach for much of the population, since many people outside the political elite constructed works of art annotated by inscriptions.⁵⁸⁷ Even though the system of viewing Squire advocates was best suited for subtle games of disjunctive meaning, best appreciated by the educated elite in a private setting, not every work of art needed to contain such obscure references nor did every viewer have to appreciate all the subtle references in a piece of art for the system to function as a cultural paradigm.⁵⁸⁸

Within this cultural paradigm, the *aes*, which was probably both engraved and painted to make key boundaries or features stand out, would have stimulated memories and cultural associations, empowering those within the community on two different levels.⁵⁸⁹ On a passive level, it would have reminded people of where they were and what the structural identity of their community was through the act of casual collective viewing. Above all, people passed through the space in which the document was hung,

⁵⁸⁶ Squire (2009), 239-250.

⁵⁸⁷ Zimmer (1982); Clark (2003).

⁵⁸⁸ Squire (2009), 271-282, particularly 276-277; Trimble (2008), 81-82.

⁵⁸⁹ Tucci (2007), 475; Trimble (2008), 81, no. 30.

much as people were reminded of their history on a casual level by the inscribed statues and paintings, encountered in both public and private spaces throughout a city. On a more active level, the *aes* would have functioned as the focus of intellectual and legal discourse, much as Varro and his friends employed the pictorial rendering of Italy at the start of his work on agriculture, as a springboard and unmentioned focus for their conversation on life in the Italian countryside.⁵⁹⁰ The *aeres* at *Daulis*, *Arausio* and elsewhere would have functioned as a mnemonic device, reminding the collective viewers of places in the community made famous by the presence of significant individuals or through key events, which were a monumental part of the lived landscape shaping their everyday identities.

3.12 Continuity, Conflict and Control in the *Forma* from Sardinia

One document illustrating some of the discursive properties of the *aes* and *forma* is the bronze tablet from Esterzili on Sardinia. The tablet records the *decretum* of the Roman governor L. Helvidius Agrippa in a property dispute between the *Patulcenses*, who held a block of divided and allocated land near modern Partedi, and the indigenous *Galillenses*, whose *civitas* was near modern Gerrei:

When the Emperor Otho Caesar Augustus was consul, 16 days before the Kalends of April (17th of March 69 AD). Transcribed and authenticated from the bound *codex* of Lucius Helvius Agrippa, proconsul, which Gnaeus Egnatius Fuscus, quaestorial scribe produced, in which was written what has been written out below. On page 5 at headings 8, 9 and 10: 3 days before the Ides of March (27th of February) Lucius Helvius Agrippa, Proconsul, once the case had been heard, declared: Since for the sake of the public good it is appropriate to abide by cases that have been adjudicated, and with regard to the case of the *Patulcenses*, Marcus Juventius Rixa, a very distinguished man and the Augustan procurator, has more than once proclaimed that the boundaries of the *Patulcenses* must be maintained just as they were arranged by Marcus Metellus on the bronze tablet, and in the end, he proclaimed that he wanted to punish the *Galillenses*, who had frequently renewed the dispute and who were not complying with his verdict, but out of respect for the clemency of the best and greatest princeps, he would be content to admonish them with an edict whereby they would be quiet and abide by rulings in prior cases, and before the Kalends of October next, withdraw from the lands of the *Patulcenses* and surrender the empty property. But if they persisted with their wilful disobedience to judicial

⁵⁹⁰ Compare: App. 4.28, side B; 4.61, 4.65, lines 62-74; Var. RR. 1.2.1-5; Piganiol (1962), 80-89; Wallace-Hadrill (2008), 259-264.

decrees, he would direct his severity against those responsible for the sedition. And later on, when Caecilius Simplex, a very illustrious man, on account of the same case was approached by the *Galillenses*, pleading that they would produce a document pertaining to their situation from the Archive of the Princeps, proclaimed that it would be humane for an evidentiary adjournment to be granted and gave them a period of three months, until the Kalends of December, on which day, if the map (*forma*) was not produced, he would observe the one which was in the province. When I was also approached by the *Galillenses* with excuses, because the map (*forma*) had not yet been produced, granted them a further period (of grace) until the Kalends of the February which was next, and I understood that the delay was agreeable to the possessors. Let the *Galillenses* depart from within the boundaries of the *Patulcenses Campani*, which they have occupied by force, before the next Kalends of April. And if they do not comply with the demands of this proclamation, let them understand that they will be liable for punishment on account of their longstanding and frequently denounced criminal conduct. Present in his *concilium* were: Marcus Julius Romulus, the propraetorian legate; Titus Atilius Sabinus, Propraetorian Quaestor; Marcus Stertinius Rufus, son of (Marcus); Sextus Aelius Modestus; Publius Lucretius Clemens; Marcus Domitius Vitalis; Marcus Lusius Fidus; and Marcus Stertinius Rufus. Witnesses: Cnaeus Pompeius Ferox; Aurelius Gallus; Marcus Blossus Nepos; Gaius Cordus Felix; Lucius Vigellus Crispinus; Gaius Valerius Faustus; Marcus Lutatus Sabinus; Lucius Cocceius Genialis; Lucius Plotius Verus; Decimus Veturus Felix; Lucius Valerius Peplus.⁵⁹¹

A prominent feature of this case, which is not self-evident from the text, is that the *Patulcenses* initiated the dispute by complaining to the procurator of Corsica and Sardinia about a group of *Galillenses*, who were squatting on unoccupied land claimed as part of the formal territory of the colony. In doing so, they opened up an ever intensifying discourse with a non-Roman *civitas* about the nature of the provincial landscape. That challenge forced the *Galillenses* to engage with Roman concepts of land-ownership and surveying. Whether the *Galillenses* observed similar legal traditions with the Romans or not, they would have required legal advice and representation in the hearings before Juventius Rixa, the imperial procurator. If the *Galillenses* were *veteri possessores*, occupying *subseciva* through the right of *usucapio* or as *agri concessi Augusti*, then it is possible that they had the support of a surveyor. Unfortunately, in spite of a detailed article by Margi Kantor, showing that Roman juridical knowledge entered the courts of provincial governors and procurators through both the administrators' direct application of the law, local juridical experts and through the petitions of litigants, little is known about how *civitates* like the *Galillenses* formally

⁵⁹¹ App. 4.60.

accessed legal knowledge necessary to conduct their cases before Roman magistrates.⁵⁹² Even so, the text of the inscription makes it clear that the *Galillenses* believed that their case was strong enough in both mutual and legal terms to disregard the ruling by Rixa and a subsequent edict ordering them off the land.

Rixa's initial ruling, which he probably delivered from a tribunal in the *forum* of the *Patulcenses*, validated the argument made by the *Patulcenses* that their boundaries had to be maintained just as they were arranged by Marcus Metellus on the bronze tablet. Since it can be documented that other colonies sold off or yielded land to outsiders, their argument was not strictly based in law, though the extraterritorial sale of colonial land may have required approval from the emperor.⁵⁹³ Rather, it reflects a strong conservative sense of ownership and self-identity, grounded in the rhetorical role of the *aes* as an intellectual bridge between the *forma censualis* of individual *possessores* and the concept of the colony as a collective entity, set within specific topographical limits. This construction reflects the theoretical framework for the formation of a colony, discussed in the previous chapter. It also helps to illustrate that the formation was not just an intellectual concept confined to the writings of the Roman surveyors, but permeated outwards into the thinking of at least the colonial elite and Roman provincial administrators.

In the context of the trial, the *aes* was a symbol of the colony which need not have been read off at any point by litigants or magistrates, even when they referenced it as their source of authority for their arguments. It was enough for the *aes* to be present and for people to know its general provisions through collective viewing. Only when the *Galillenses* challenged its cultural authority by requesting an adjournment to consult documents in Rome, it was necessary for the provincial authorities to reference the higher authority invested in the *forma*. Thus, the request to consult documents at Rome intensified and elevated the level of discourse, transcending the bounds of local public authority. It was vested in the power of public documents, contained within two communities of a province. It also invoked the authority held over everyone by the imperial administration at Rome. In granting that request, after giving the *Galillenses* a

⁵⁹² Paul. *Dig.* 10.1.4.1; Ulp. *Dig.* 11.6.3.4; Hyg. *De Cond. Agr.* 2000.84.34-86.21 = 2010.2.34-39; Kantor (2009), 255, 259-266; Humfress (2013), 79-86.

⁵⁹³ App. 4.8; Hyg. *De Gen. Contr.* 2000.98.17-27 = 2010.3.30-31; Hyg. *Const. Lim.* 2000.154.30-156.5 = 2005.13.7-10.

hearing over a prolonged period, the proconsul Helvius Agrippa shows that, while the Roman administration may have been prejudiced in favour of Roman colonists, they were willing to recognise that the final say in any matter rested with the emperor. It was possible for him to have made a concession to the *Galillenses*, which was recorded at Rome, but which had not been added to the copy of the *forma* held in the provincial archives.

As Junius Nipsus and Siculus Flaccus both observe, in the event of a dispute over unoccupied lands in a colony, it was essential for a surveyor to consult not only the *aes* and the *forma*, but the imperial book of benefactions for the province, in order to make sure that the emperor had not exercised his privileges and granted the land as part of a supplementary colonial allocation or as *ager concessus Augusti*.⁵⁹⁴ To judge from the text of the inscription, the proconsul thought that the *Galillenses* were searching for the emperor's copy of the *forma*, while in truth they may have been searching for the text of an edict, which granted them title to the land. In either case, their inability to secure the required documents should not be seen as proving them in the wrong since the violent events at Rome in 69 AD could well have prevented them from accessing the imperial archives.

3.13 Lines of Control and Realms of Identity in the Provincial Landscape

While the activities of the *Galillenses* and *Patulcenses* suggest that they lived within a world system regulated by the universalising tendency, discussed in Chapter One, and a specific form of geo-political framework regulated by surveyed boundaries, it does not elaborate on that framework in any detail. Conversely, a later inscription from Arles clearly articulates a world view, in which communities were defined by a graduated scale of shifting, intersecting and overlapping boundaries and forming discrete spheres of identity within the administrative and geographic framework of a province, regulated by the central authority at Rome.

⁵⁹⁴ Tac. *Ann.* 14.18; Agen. Urb. *De Contr. Agr.* 2000.40.21-32; Jun. Nips. *Lim. Rep.* 57.189-194; Sic. Flac. *De Div. et Ass.* 2000.120.19-32 = 2010.4.1-4.

The notes of tension and contention implied in the articulation of self-identity and the discrepant experience of power under Rome, as they were articulated, ripple across the provincial landscape and up the graduated scale of the imperial hierarchy, in a manner which complements and augments those narrated in the text just considered. The truly remarkable feature of the text is that it was not a monumental boundary marker or the account of a property dispute, but rather an honorific dedication set up to the wealthy freedman Quintus Cornelius Zosimus by a group of people living on a rural estate outside the *Colonia Julia Paterna Arelatis*, which casually employed Roman surveying terminology to structure the relationship between a group of *clientes* and their patron:

The countrymen of the Lucretian Pagus, who are within the territorial borders (*finibus*) of the *Arelatensies*, on the Gargarian estate (*loco Gargario*), dedicate this to the honour of Quintus Cornelius Zosimus, freedman of Marcellus, member of the board of six *Augustales* at the *Colonia Julia Paterna Arelatis*, who conducted the case concerning our injustice to the most holy *princeps* of the entire world, Titus Aelius Antoninus Augustus Pius, at Rome three times. For many years he petitioned the proconsuls of the province. He sought redress for our injustice at his own expense. And for this (reason) provided on our behalf, the financial outlay which made it so that the benefactions of the most holy *princeps* of the entire world, the Emperor Caesar Antoninus Augustus Pius, for the water and public bathing establishment, which we were enjoying free of charge, and which was discontinued for the country folk, though they had utilised it for more than 40 years, might endure and remain perpetual for all time.⁵⁹⁵

In describing themselves, the *pagani* or country folk of this inscription make it clear that they were citizens of the colony, who enjoyed benefits there for a considerable period. But they do not claim to be Roman citizens. While Murielle Faudot has suggested that they were a mixed group of Roman and indigenous Gallo-Roman tenants farmers – a suggestion which fits with recent scholarship on veteran settlement – the Roman agrarian economy and the asymmetrical social relationships between Roman patrons and their clients cannot be established beyond question.⁵⁹⁶

⁵⁹⁵ App. 4.62.

⁵⁹⁶ Faudot (2006), 116, 118; Kehoe (2007), 76, 93-96; Haynes (2013), 341-344, 361-363; Lavan (2013), 160, 165-166, 169-173, 181-185; Mac Gaw (2014), 80-86.

Far more important than the social identity of the countrymen is the language they used to construct their place in Roman society and their relationship to the wider world. They claim to be the countrymen of the *locus Gargarius*, which is in the *pagus Lucreti*. Within the juridical taxonomy, employed by Roman surveyors and jurists, a *locus* was, broadly speaking, any settlement site, and in the narrow sense that the term was used by the *pagani*, it was either a portion of a larger *villa* estate, or else a *fundus* joined with others to form a *latifundum*.⁵⁹⁷ Since colonial *pagi* were most commonly created by the *deductor* as *ager consessus* through the allocation of land to colonists without any *limites*, the *locus Gargarius* was probably a *fundus* comprised of small holdings, incorporated into a larger estate in an outlying rural district.⁵⁹⁸ More than twenty such semi-autonomous rural districts belonged to the *Colonia Julia Paterna Arelatis*. However, it seems to be the only one which was *finibus Arelatensium* or within the territorial boundaries of another community.⁵⁹⁹ Such a description suggests that the *pagani* understood themselves to be a collective group working land. It was part of an estate which itself was owned by a larger estate set within the boundaries of an uncenturiated district that belonged to a colony, but which was physically enclosed by the boundaries of a non-Roman *civitas*.

Furthermore, the language used to describe the activities of Zosimus, the patron of the *pagani* and Antoninus Pius, suggests that they conceptualised *pagus*, *civitas* and colony as all being situated politically and geographically within a province administered by a governor, which was in turn under the emperor at Rome, who ruled over the entire world. There is nothing in the inscription to show how the *pagani* envisioned the physical structure of the province, but the phrase *omnis saeculus* as a method of describing the extent of the emperor's power is quite telling. It suggests that, like the Roman land surveyors, the *pagani* from the *locus Gargarius* considered their community as being encompassed by the boundaries of the *civitas*, which contained it and the province itself as being contained within a spherical world over which the emperor held absolute power.⁶⁰⁰

⁵⁹⁷ Ulp. *Dig.* 50.16.60; Flor. *Dig.* 50.16.211; Faudot (2006), 120.

⁵⁹⁸ Isid. *Or.* 15.2.14; Sic. Flac. *De Cond. Agr.* 2000.112.15-20 = 2010.2.28; *De Div. et Ass.* 2000.126.30-128.1 = 2010.4.35-36.

⁵⁹⁹ Tarpin (2002), 14-17, 33-37, 49, 219.

⁶⁰⁰ Geus (2014b), 118-119, 123-124, 126-127; Roby (2014), 26-30.

The surveyors' geographical world view and their role in creating provinces as a framework for interstate interaction and imperial administrative activity will be discussed more fully in the next chapter. At this point, it is worth noticing that the encompassing boundaries of the *aes*, found in the inscription from Sardinia and those conceptualised as encompassing the *locus Gargarius* and its *pagus* in this text, seem to be similar topographical constructions born of the surveyor's craft. When they are considered with the system of property boundaries in the texts from *Histonium* and the *pagus Cantiacorum* examined above, they tend to substantiate Chouquer's argument for seeing the Roman landscape as a series of graduated interlocking circles, which began with individual holdings and expanded upward and outward in a complicated stratigraphy.

3.14 The *Limites* of Power in the Roman Provinces

Before moving on to explore the role of surveyors in Roman conquest and the creation of the provinces, two final points raised by the situations introduced by the *Galillenses* and the *pagani* from the *locus Gargarius* need to be considered. The first is the problem of local resistance to the surveyors and the implementation of judicial *decreta*. Helena Abreu de Carvalho, reporting on *Breccara Augusta*, and William Bowden, reviewing the built environment of *Epirus*, have convincingly argued that indigenous populations around a colony freely entered into a discourse with the colonists to develop the landscape. This occurred frequently, even relocating their settlement sites to take advantage of the imperial communications network, extending from the *limites* of the new settlement, out along and across rivers and mountains to link the distant parts of the Roman world.⁶⁰¹ Yet, the problems faced by the *Galillenses* and the presence of the *locus Gargarius* within the territory of the *Arelatensies* show that the discourse could be heated and contentious.

While the *locus Gargarius* may have been established on land, bought from the *Arelatensies* by one Lucretius to establish the *pagus*, the existence of *pagi* in Italy, whose boundaries encompassed land from two different communities, suggests that

⁶⁰¹ Carvalho and Azevedo Mendes (2010), 157, 162; Reis Martines and Carvalho (2010), 290-293; Bowden (2011), 110-112; Kowalski (2012), 80-82; Kolb (2013), 114-115.

many were created by the right of *usucapio in agri occupatorio*.⁶⁰² Epigraphic evidence advises that the need to secure land for use against this sort of conduct under Roman law was acute enough to stimulate even semi-nomadic tribes, such as the *Rodopeis* of Thrace, to employ surveyors, in order to establish boundaries to regulate land and adjudicate disputes.⁶⁰³

Even so, the involvement of surveyors in local matters was not always a choice for all concerned in a local dispute. There were unquestionably times when angry cattle-drovers and land-holders used violence to obstruct a survey. However, the only documentary record of such an event comes from a series of fragmentary letters, preserved on marble blocks, which once formed an archive wall in the Greek city of *Koroneia*. The letters were all addressed to the *Koroneioi* and their southern neighbours, the *Thisbeis*, by Hadrian and Antoninus Pius. Modern commentators still do not agree on the original order of presentation for the documents inscribed on the wall, making it difficult to establish the exact sequence of events, chronicled in the surviving documents.⁶⁰⁴

What is clear from four of the letters is that, shortly after Hadrian initiated the construction of an aqueduct and drainage project intended to reclaim land from Lake *Copais* in 125 AD, the people of *Koroneia* petitioned the emperor to adjudicate a dispute, involving summer pasture high in the mountains between *Koroneia* and the land of the *Thisbeis*.⁶⁰⁵ The problems may have involved negotiating servitudes to transport water across the land of other civic territories and the flooding of fields caused by problems in the engineering works or control over previously unusable land. This disrupted agricultural and pastoral activities, though from the documents long-running political tensions were involved as well.⁶⁰⁶ Whatever the cause, Hadrian's direct instigation of the project prompted him to appoint a special judge, a local magnate named Mestrios Aristonymos, to hear the case instead of handing the matter back to the provincial governor in the usual way. After looking into the matter, Aristonymos assigned the pasture to the people of *Koroneia*. However, his judgment was not

⁶⁰² App. 4.7; Santangelo (2006), 617, 620, 624-626.

⁶⁰³ App. 1.11.

⁶⁰⁴ Elliott (2004), 137, nos. 325-327.

⁶⁰⁵ Birley (1997), 186; Elliott (2004), 137, no. 326.

⁶⁰⁶ Elliott (2004), 317-318; Leveau (2012), 86-88.

respected and fighting broke out between the two communities. Hadrian responded to this breach of the peace not with force, as was done in similar situations elsewhere in the Empire, but with a letter admonishing the two communities:⁶⁰⁷

(A letter) of the divine Hadrian, written to the *Thisbeis*. The *Koroneioi* wrote to me, accusing you of doing the opposite of what Mestrios Aristonymos decided on my order, but it was right – when you did not obey the decisions but began invading their territory – that they should resort to preventing you from grazing. How much the tax due to them is, or what security of yours the *Koroneioi* have kept, Aristonymos himself will judge. Farewell.⁶⁰⁸

Following this letter, the *Thisbeis* apparently changed tactics and like other Greek states, which lost a property dispute at the highest levels of the Roman judicial system, challenged the validity of the boundary used as a guide to award the property.⁶⁰⁹ In 154 AD Antoninus Pius issued a ruling ordering a survey of the land in question. However, one party or the other in the case was unhappy with the survey and used force to obstruct the work. Antoninus Pius, exasperated by the situation, ordered the proconsular governor of the province to carry out an investigation into the matter and punish those responsible for this condition:

The Emperor Caesar, son of the Divine Hadrian, grandson of the Divine Trajan Parthicus, great grandson of the Divine Nerva, Titus Aelius Hadrianus Antoninus Augustus, Pontifex Maximus, holding the tribunician power for the 18th time, (hailed as) Emperor two times, consul for the 4th time, Father of the Fatherland, to the magistrates, council and people of the *Koroneioi*, greetings. I have sent you a copy of the verdict which I made between you and the *Thisbeis*, and I wrote also to Mestrios Aristonymos to measure out the *plethra* for the *Thisbeis* which my divine father ordered to be given to them. And if the *Thisbeis* should persuade you (to allow them) to pasture (their livestock) on some of the land outside (the allocated area), they will pay a pasturage tax. If ever they should also restore as much as they are judged to owe for the previous period (when they occupied your land), it is clear that you will also restore the collateral to them. Ailios Glykon and Dionysios son of Dionysodoros were the envoys, to whom the travel allowance should be granted unless they promised it as a gift. Farewell.⁶¹⁰

⁶⁰⁷ AE 1979.0648; Jos. *AJ.* 20.2-4; Tac. *Hist.* 4.50.

⁶⁰⁸ App. 2.9; Fossey (1982), 50-52, no. 9; translation adapted from Elliott (2004), 145.

⁶⁰⁹ App. 2.7; Tac. *Ann.* 4.43; Elliott (2004), 76.

⁶¹⁰ App. 2.9; Fossey (1982), 50-52, no. 11; translation adapted from Elliott (2004), 146.

The Emperor Caesar, son of the divine Hadrian, grandson of the divine Trajan Parthicus, great-grandson of the divine Nerva, Titus Aelius Hadrianus Antoninus Augustus, Pontifex Maximus, (holding the) tribunician power for the 18th time, (hailed as) Emperor for the 2nd time, consul for the 4th time, Father of the Fatherland, to the magistrates, council and people of the *Koroneoi*, greetings. Upon hearing your decree, I ordered a copy of those things which I sent to the *Thisbeis* to be sent to you so that you might know that I considered the matter worthy of attention. Because you accuse them and they accuse you of not allowing the measurement of the *plethora* to occur in accordance with the verdict that my divine father rendered concerning these matters and which I, judging it to be valid, uphold. Hence forth, the proconsul will be responsible for finding out which of the two parties (in this dispute) are the ones refusing to comply with prior judgments, and he will provide for the quickest possible way to establish the resolutions of the verdicts ... by Aristonymos so that a quick conclusion might be made of an affair ... providing an origin and an excuse to the cities for strife and rivalry. The ambassadors were Aelius Glykon, Alo... gift, as you made clear through your decree. Farewell.⁶¹¹

It is important to recognise that the violence, which was unquestionably used to disrupt the survey in this case, represented a response to and rejection of the *decretum*, issued by Aristonymos. Surveyors drew their authority to act from the individual or individuals who commissioned the survey. The testimony of Agennius Urbicus, Ulpian and Paul indicates that attempts to bribe, threaten and perhaps even beat surveyors into acting against their better judgment or to prevent the implementation of a *decretum* were a common concern.⁶¹² In this case, however, the situation was probably exacerbated by the nature of the project started by Hadrian and the unusual latitude he gave to the Greeks. Had he shown a strong hand when the problem of the boundary had first come to light as Pius? He eventually did, it is likely that violence would have been averted and the case would not have dragged on for nearly thirty years.

Fortunately, not every imperial surveying operation was so monumental in scope or duration. Most direct opposition to other imperial surveys rarely reached the point that an armed response was required, and emperors like Hadrian and Pius only became directly involved when matters of imperial patronage were a concern. The situation at *Aizanoi*, considered elsewhere in this study, is perhaps a prime example. As discussed in Chapter One, the people of *Aizanoi* were locked in an internal struggle over whether or not a small group of land-holders had to pay rent to the civic government to maintain

⁶¹¹ App. 2.9; translation adapted from Elliott (2004), 145.

⁶¹² Agen. Urb. *De Contr. Agr.* 2000.46-48; Ulp. *Dig.* 11.6.1.1-2; Paul. *Dig.* 11.6.2-3.

and/or finance the rebuilding of the Temple of Zeus.⁶¹³ When the problem was placed before the Roman proconsul for adjudication, Mettius Modestus ruled that the rents were due. The question was then how much each land-holder should pay and from what point in time payments should be considered due. The problem was compounded by the fact that the pattern of land-holding had been greatly disrupted, since the original foundation of the temple occurred some three hundred years earlier. This factor contributed to the notion that the rents were considered a fiction dreamed up by the temple priesthood.

Concerned about the possibility of civil unrest over the matter, the proconsul Avidius Quietus intervened and/or commissioned surveyors to establish the average size of allotments in the region around *Aizanoi* and with the backing of Hadrian fixed a date for payment. Not content with this situation, a number of land-holders, presumably using information derived from the surveyors' investigations, challenged their need to pay rent on the grounds that their land was outside the temple's boundary. Sensing an opportunity to enhance his image as an imperial benefactor, Hadrian pledged the money to rebuild the temple and dispatched a centurion to survey the outer boundary of the temple, putting an end to the question of whether or not people had to pay rent. The centurion, acting under the direct authority of the emperor, established a series of bilingual boundary markers, which stated in no uncertain terms that they marked what Hadrian accepted as the ancestral boundary-line around the Temple of Zeus:

The Emperor Caesar Trajan Hadrian Augustus, Father of the Fatherland, Consul for the 3rd time, (holding the) tribunician power for the 13th time, restored the boundaries given to Zeus the Founder and the community of the *Aezaniti* by Attalus and Prusias the Kings, since Septimius Saturninus, the *primus pilus* made a measurement, such as King Prusias had established.⁶¹⁴

Whether the continuity Saturninus established between Hadrian and Prusias by creating the boundary around the temple had any historical truth behind it, was not important. The people of *Aizanoi*, like the *Siccaenae*, employed surveyors or survey knowledge to make a claim about geometrically constructed space under Roman law. Thus, the emperor had countered that claim using the exact same principles. People, regardless of their citizenship, consulted with surveyors to reorganise the landscape and

⁶¹³ See: Cuomo (2007), 117-118; Chapter 2 above.

⁶¹⁴ Kearsley (2001), 140-141, no. 166.

stake a claim to it within the very specific ontological system of justification, derived from the Hellenistic principles of proof. Not every group of people in the Empire subscribed to that world view. As a consequence, many communities never bothered to organise land and their dwellings on it in accordance with the principles practiced by the Roman surveyors. Indeed, the only reason to organise the landscape in this fashion was to make a claim about it in the face of Roman power.

It was that power which Saturninus accredited in the name of Hadrian, and it was that power relationship which prompted someone to inscribe the Greek letter of Quietus and its supporting documentation on the wall of the *pronaos* in the Temple of Zeus.⁶¹⁵ Like the bilingual boundary-markers, which reminded the tenants of their place on the land and the obligation to pay rent to the temple for it, the letters were a reminder to the priesthood that their privilege to collect the rents along with their temple itself and the province within which the entire city of *Aizanoi* was situated, were a construction of the emperor and the surveyors who served him.

⁶¹⁵ Kokkinia (2004), 49.

Chapter Four: Storming the World: *Agrimensores*, Measurement and Roman Power Beyond the Frontiers

“For while I was more involved in military service, I set this entire business aside as if it were forgotten, thinking about nothing except the glory of war. After we entered enemy territory for the first time though, Celsus, at once the operations of our Caesar began to require surveying skill”.⁶¹⁶

4.1 Introduction

Written by the Roman surveyor Balbus, these lines constitute one of the few passages in the whole of Latin literature that equate Roman conquest with technical skill. As such, it is an open invitation to explore the role of surveyors and surveying in Roman warfare and conquest. Yet only Robert Sherk in his 1974 article on Roman military exploration and geographic mapping has seriously considered the subject.⁶¹⁷ While this study forms a valuable starting point, it is not without its problems and Sherk’s discussion does not represent a full account of the surveyors’ role in Roman conquest. Using the text of Balbus and the work of Sherk as a guide, this chapter reconsiders the place of surveyors within the Roman army and, specifically, their role in the exploration and conquest of territory beyond Rome’s control. It will pay particular attention to the tasks that the surveyors carried out while the Roman army was on campaign, the way in which they carried out these tasks, and the impact of their activities on the imperial administration’s own conception of the Empire.

Because of limitations introduced by the available range of evidence, a comparative approach will be adopted here, in which information from a range of contexts will be used to assess the impact of military surveyors in conquest and the creation of new provinces as discrete spaces under Roman control. In order to structure such a complicated synthesis of material, the chapter is broken into two parts. The first section, which is structured around the narrative of Balbus, discusses the practical

⁶¹⁶ Balb. *Ad Cels.* 2000.204.18-21.

⁶¹⁷ Sherk (1974), 546-561.

contribution of surveyors and surveying to the tactical situation of a Roman army on campaign. The second section leaves the narrative of Balbus to consider a range of sources with the aim of exploring how the surveyors' activities on campaign shaped the Roman administration's understanding of the Empire through the creation of provinces as formally defined places marked by boundaries.

4.2 Balbus and the Narrative of Conquest

The text of the surveying treatise written by Balbus, which was introduced in Chapter Two, contains more details about the activities of legionary surveyors on campaign than any other surviving document. Balbus, however, because he was not primarily writing about either the campaign he participated in or about the Roman army as an institution, omits material on military surveyors found in other works and, as the discussion in previous chapters has shown, was deeply engaged in a dialogue with Greek philosophy.⁶¹⁸ It is therefore important to understand exactly what it was that Balbus wrote and why he wrote it in order to properly synthesise the three examples of the surveyor's craft considered in the following sections into a full picture of the surveyors' contribution to Roman tactical operations.

According to his own account, Balbus was a young surveyor, who, in a quest for personal glory, answered a call for volunteers to serve as part of an expedition to *Dacia*.⁶¹⁹ During his service, Balbus apparently caught the eye of the imperial high-command by demonstrating an unusual aptitude for surveying. When hostilities were concluded, Balbus was granted the rare honour of a year's leave from the legion to compose a work on the mathematic principles of surveying.⁶²⁰ Balbus, writing in the spirit of Euclid, Archimedes and Eratosthenes addressed and, perhaps, sent his work to his friend and former teacher Celsus, who may have been an Alexandrian mathematician of some standing.⁶²¹ As the discussion in Chapter Two has already indicated, the work Balbus composed contained a summary of all the principles of

⁶¹⁸ Compare: Veg. *Mil.* 2.7.3-9; 3.8.4-5; Hyg. *De Munit. Cast.* 12; Balb. *Ad Cels.* 2000.204.18-32; Guillaumin (1994), 281-290; (1996), 6-8; Bohlin (2013), 6, 13-15, 22, 25-26; Roby (2014), 34-39, 44-47.

⁶¹⁹ Balb. *Ad Cels.* 2000.204.18-32.

⁶²⁰ Balb. *Ad Cels.* 2000.204.28-32; Roby (2014), 35-37, 40-48.

⁶²¹ Balb. *Ad Cels.* 2000.204.3-12; Arch. *De Mech.* Pref. 1-4; Crişan and Timoc (2004/5), 157; Jaeger (2008), 1-3; Roller (2010), 12, 270; Bohlin (2013), 6, 13-15; Fodorean (2013), 16; Roby (2014), 21, 34, 36-37, 44-46.

geometric surveying and natural philosophy Balbus had learned during his apprenticeship and a number of new applications developed while on campaign.⁶²² The principle that warfare contributed directly to the advancement of human knowledge was not uniquely held by Balbus, and is a point which will receive more attention below.⁶²³

The date and nature of Balbus' military service is problematic, since both Domitian and Trajan conducted campaigns across the Danube. There are three indicators, however, which suggest that Balbus served under Trajan in at least one Dacian War. First, Balbus states that he abandoned his writing unexpectedly to join the emperor on his expedition to *Dacia* in search of military glory, suggesting that Balbus was swept up in a large scale effort to gather new recruits prior to hostilities.⁶²⁴ Documentary evidence shows that Trajan formed two new legions prior to the second Dacian War, while Domitian only used existing legions pulled from the provinces of Moesia and *Britannia*.⁶²⁵ Second, Balbus states that his leave to write was granted only after the emperor had "opened up *Dacia*", suggesting that the army had succeeded in conquering the entire territory incorporated into the Roman province by Trajan and Hadrian.⁶²⁶ Lastly, Balbus constructed his account of the war and his activities as a continuous travel narrative during which he first enters enemy territory by constructing a new road, crosses a river, and then conquers an enemy mountain stronghold before being allowed to return to the heart of the Empire.⁶²⁷ Such a travel narrative echoes the one surviving fragment of the *De Bello Dacico*, which shows that, for Trajan, travel played a major part in the chronicle of his campaigns:

From there we then advanced to Berzobim, then on to Aizi.⁶²⁸

The centrality of travel narratives in the historiography and propaganda associated with the Dacian Wars may also be reflected in the frieze on Trajan's Column. At one time scholars such as Lino Rossi saw the frieze as showing episodic snapshots of the war, but more recent studies by scholars such as John Coulston have noted that the

⁶²² Balb. *Ad Cels.* 2000.204.8-14; Campbell (2000), 433-437.

⁶²³ Ash (2011), 8-11.

⁶²⁴ Balb. *Ad Cels.* 2000.204.10-14; Bennett (1997), 89-91; Fodorean (2013), 15.

⁶²⁵ Dio. 67.6; Jord. *Get.* 76-77; ILS 9200; Bennett (1997), 91-3, 100-101; Fodorean (2013), 12-13, 15.

⁶²⁶ Compare: Balb. *Ad Cels.* 2000.204.29-33 with Dio. 67.6 and Jord. *Get.* 77.

⁶²⁷ Balb. *Ad Cels.* 2000.204.17-30 and compare Salway (2007), 189-190.

⁶²⁸ Traj. *Dac.* fr. 1; Sherk (1974), 541-542; Bennett (1997), 97.

presentation more nearly reflects a continuous narrative such as one might see or read by unfurling a scroll; suggesting that the freeze was derived from the emperor's war commentary in order to generate political capital and shape Trajan's image as a successful emperor in the minds of the public.⁶²⁹ Andrew Wallace-Hadrill, in a recent study of Vitruvius, has shown that technicians often engaged directly with the reigning emperor's ideology to craft a place of importance for themselves as authorities who were crucial for the maintenance of Roman society.⁶³⁰ As soldier and surveyor seeking glory and a strong position within the society of surveyors, Balbus would have found it advantageous to craft the narrative portion of his work so that it was in dialogue with the emperor's own published account. As a consequence, it is more than likely that Balbus served under Trajan and structured his account of *servus* in *Dacia* to complement the *De Bello Dacico* and Trajan's Column.

4.3 Balbus and the Shape of Empire

Another feature crucial to understanding and interpreting the writings of Balbus as a source for the role of surveyors in Roman conquest is the author's world view. Following the sentence quoted at the start of this chapter, Balbus explains how he was expected to create a road to help the Roman army reach their objective. The road he describes and the introduction to it move through what might be termed chronological, tactical and strategic space.⁶³¹

Framed by Balbus' statement that he had just entered enemy territory ("*at postquam primum hosticam terram intrauimus...*") and a declaration that he was allowed to return from the northernmost reaches once *Dacia* had been opened up ("*statim ut e septentrionali plaga annuauice transpire permisit*"), the Roman military assault road forms the core of a journey, which seemingly moves in a linear one-dimensional fashion from the safe area inside the Roman Empire outward into hostile territory before returning once again to where it started.⁶³² As the narrative progresses into the enemy landscape, the narrator uses the construct of the road to link and

⁶²⁹ Rossi (1971), 197-199; Coulston (2001), 107; Fodorean (2013), 15; Levithan (2013), 74, no. 106.

⁶³⁰ Wallace-Hadrill (2008), 144-169; McEwen (2003); König (2009); Harris-McCoy (2016).

⁶³¹ Rambaud (1974), 114-122; Riggsby (2006), 23-26; Spencer (2010), 34-36; Roby (2014), 25, 29, 40-1, 4-46.

⁶³² Balb. *Ad Cels.* 2000.204.19-23, 29-32.

dominate rivers and mountains, two key topographical features in ancient geography, in order to transform the territory of *Dacia* into a Roman province over the course of time.⁶³³ This transformative literary motif conjures up an image of the Empire as a finite part of the world, organised into compartmentalised provinces with delineated internal and external boundaries. They could be described mathematically, even as Vitruvius described the orders of architecture in terms of the geometric proportions of the human body, and Galen, in what may be an inversion of Strabo's analogy of a geographer, subdividing the world in the manner of a surgeon amputating a human being, described the human body in terms of a geometrically defined world.⁶³⁴

Passages from Herodotus, Aristotle and Aristophanes show that these ideas about linear travel and a geometrically structured world formed part of an intellectual panoply of congruent concepts of spatial perception. They ranged from an intuitive or deontological approach on the one hand, to a fully reasoned understanding of the world marked by maps on the other, centuries before the advent of the Roman Empire.⁶³⁵ By employing depictions of linear travel alongside geographic terms such as *septentrionali* or 'the northern reaches', Balbus could contextualise the immediate experience of travel within a global framework derived from Hellenistic geography as it was developed by Eratosthenes.⁶³⁶ More importantly, Balbus, like many other surveyors, used this construction of the world to demonstrate his own erudition while writing Roman surveying into a wider philosophical discourse even as he articulated the main purpose of his work:⁶³⁷

Therefore, after the greatest of emperors through his recent victory, had opened up *Dacia*, he permitted me to leave the northern regions for a period of one year, and I returned to my studies as if I was returning to a period of leisure and I gathered up the many ideas almost written out on individual

⁶³³ Coulston (2001), 128; Murphy (2004), 133-138, 149-154; Geus (2007), 117, 119-121; Talbert (2010), 89-90, 95; Kowalski (2012), 83; Bianchetti (2013), 80; Roby (2014), 20.

⁶³⁴ Plin. *HN*. 6.141, 160-161, 181-182; App. *Praef.* 3, 4, 7; Ael. Arist. *Or.* 26.79-94; Vit. *De Arch.* 3.1.1-5; Str. *Geog.* 2.1.30; Ptol. *Geog.* 1.1.3-5; Gal. *Anat. Admin.* 8.1; Talbert (2004), 25-26; (2005), 93-94, 100; Roby (2014), 25, 28.

⁶³⁵ Herod. *Hist.* 4.36; 5.49; 5.52-54; Aristot. *Meteor.* 2.5 362bl2; Aristoph. *Meth.* 200-217; *Lysist.* 1156-1180; Dan (2014), 18, 20-21, 24, 30.

⁶³⁶ Geus (2002), 233-238; (2004), 19-24; (2007), 119-121; Roller (2010), 5-7; Bianchetti (2013), 79-86.

⁶³⁷ Balb. *Ad Cels.* 2000.204.29-32; Hyg. *Const. Lim.* 2000.144.23-148.19 = 2005.7.1-8.8; Agen. Urb. *De Contr. Agr.* 2000.18.13-31; Sic. Flac. *De Cond. Agr.* 2000.102.20-22 = 2010.1.4; Dilke (1967), 25-27; Guillaumin (2005), 193, nos. 144-146; Abry (2011), 231-234; Jones (2012), 113-115; Geus (2014a), 113-114, 126-127.

leaves and scattered about so that I could incorporate them into the canon of our craft.⁶³⁸

As discussed elsewhere in this work, much of this discourse, and indeed the surveyors' canon of practice, involved the geometric construction of space and the development of maps, which reflected that construction.⁶³⁹ The ability to conceptualise the world in this way, as well as to construct or use the maps that went with it, represented learned skills beyond the reach of most people.⁶⁴⁰ As the previous two chapters have shown, however, these constructions of space and their depictions seem to have become increasingly prevalent as features defining the lives of various constituencies in the provinces, as well as their awareness of, and consensus about, the nature of Empire. Most people who travelled beyond their own home communities or who had extensive contact with the imperial administration seem to have recognised, although to varying degrees, the existence of limits to both provinces and the Empire itself, which functioned as adjustable zones of legal and military control.⁶⁴¹ These people also seem to have recognised that movement between and the adjustment of these administrative zones depended upon roads, rivers and an exact knowledge of them derived from the surveyor's craft.⁶⁴²

4.4 Balbus, Trajan and the Roman Roads of War

The road marked out by Balbus as a means of navigating both narrative and landscape forms the first of three *exempla* that demonstrate how surveyors structured tactical space on campaign, providing a unique window into Roman military operations:

Two parallel straight lines with an established distance between them had to be provided for the roads, so that a dense mass of stakes would rise up along them as protection for the supply lines: the use of the *ferramentum* extended these parallel lines through your discovery (of a method) for the reduction of a section of the road works to a narrow point.⁶⁴³

⁶³⁸ Balb. *Ad Cels.* 2000.204.29-32.

⁶³⁹ Roby (2014), 20, 25, 29; Chapter 3 above.

⁶⁴⁰ Dan (2014), 18-21.

⁶⁴¹ Talbert (2004), 24-26; Salway (2007), 201-203; (2012), 207-210; Richardson (2008), 180-181; Haensch (2011), 98-99, 104-105; Caballos Rufini (2011), 186-191; Gordon Peral (2011), 211-213, 218-219.

⁶⁴² Salway (2001), 39-43; (2004), 66-85; (2012), 178-190; Talbert (2004), 23, 29-32; (2007), 257-259, 265-67; Kolb (2013), 112-115.

⁶⁴³ Balb. *Ad Cels.* 2000.204.21-23.

It is difficult to understand exactly what Balbus is describing in this passage. Every scholar who has edited or translated this section of text, other than Brian Campbell, has omitted the end of the second half of the last clause so that they can interpret the passage as the description of a road leading into a fortified camp; although the syntax of the full sentence precludes this.⁶⁴⁴ Since no other Latin author mentions either a palisade or the use of survey lines to create a road as Balbus does, it is not really possible to interpret the text using other Latin descriptions of road construction.⁶⁴⁵ Likewise, the subject of laying out Roman roads is not one that has been covered in most traditional works on the roads of the Empire such as those published by Raymond Chevallier or Ray Laurence.⁶⁴⁶ Only the experimental investigations into Roman road design carried out separately over the last fifteen years by John Poulter, Hugh Davies, and most importantly, Michael Lewis, have shed any light on this passage of Balbus.

In 1998, Hugh Davies, in an attempt to explain how the Romans laid out their roads, argued that they first surveyed the line between two points then totalled the east-west and north-south displacements established by the survey so as to gain the overall bearing.⁶⁴⁷ When topographical features on the ground prevented them from laying the road out in a straight line, Roman surveyors would first plan out the line of the road across the area that they had surveyed, as though on a map, and then measure out the line of the road on the ground by means of offsets at right angles to the survey lines (Fig. 4.1). Michael Lewis, doubting the practicality of this method, if for no other reason than a lack of evidence for Roman scaled maps like those Davies advocates, experimented with the instruments available to the Romans and argues that the roads were laid out using pure geometry.⁶⁴⁸ This method, which reflects observations made by Claudius Ptolemy on finding a direction relative to the meridian, depends on one fixed point, which is ideally elevated above the landscape, and is based on the geometry of similar triangles (Fig. 4.2):

⁶⁴⁴ Guillaumin (1996), 22-25; Campbell (2000), 204-205; Cuomo (2001), 171-172; Crişan and Timoc (2004/5), 178.

⁶⁴⁵ Compare: Liv. 9.29.6, 10.47.4; Stat. *Silv.* 2.2.11, 4.3.40-55.

⁶⁴⁶ Chevallier (1997); Laurence (1999).

⁶⁴⁷ Davies (1998), 5-12.

⁶⁴⁸ Brodersen (2001), 14; Lewis (2001), 232-235; (2012), 145-148; Talbert (2012b), 165, 180; (2012c), 192-193.

Let us suppose the surveyor wants to stake out a direct route from A to B, which he knows lies roughly east of A, and his best guess is that it lies a little north of east. By extrapolation he projects a line AX in that direction, sighting from high-point to high-point. When it becomes clear that his line passes well north of B, he returns to A and projects two new alignments AY and AZ further to the south, designed to bracket B, and he stakes them out as he goes. Then, from B he projects two lines back on the reciprocal bearings until they intersect AY and AZ at C and D. The diagonal between C and D is measured, and the point E halfway along it is marked. Because ACE and BDE are identical triangles, as are ADE and BCE, AEB is a straight line. To fill in further points on this line, the same process can be repeated on a smaller scale or can be interpolated in the usual way, as the terrain directs.⁶⁴⁹

There are problems with Lewis's reconstruction, particularly the issue of establishing directions without the benefit of a compass, but the work of two separate scholars has shown that Roman surveyors undoubtedly used some system of this sort to lay out roads. Lorenzo Quilici, investigating the Via Appia in Italy has noted that the 90 km straight line that runs between Rome and Terracina is marked by only one significant point for back-sights at Colle Pardo near Ariccia, where the surveyors took a line from the Temple of Diana on the Aventine, some 23 km to the rear. The same high-point was used to make a foresight to the seaward cliff of Leano, targeting the shrine of *Lucus Feroniae*, since the summit of the cliff blocks the view of Terracina, some 61 km to the south. As Quilici notes, the axis of these straight stretches was marked directly on the ground, establishing on site where the road had to pass, including the intermediate destinations, and the road deviated from the established alignment only to negotiate topographical features which the Roman construction crew could not either remove or otherwise bridge.⁶⁵⁰

Working independently of Quilici, John Poulter also supports Lewis's theory through his investigation of alignments for Roman roads in the north of England. Poulter has shown that the road running between Tadcaster and the Dry Burn was laid out using a system of long-distance alignments sighted on prominent features found at high points in the landscape, which were visible from just over the brow of a hill. Many of the alignments cover a distance of more than 30 km; a distance Quilici also considers

⁶⁴⁹ Lewis (2012), 146.

⁶⁵⁰ Quilici (2008), 554-555, 560-561.

normal for Roman alignments.⁶⁵¹ Poulter also shows that the planning alignments were apparently created to establish the general line of a road without taking river crossings into consideration. When the road was actually built, all the deviations from the alignment were made on high ground to approach a river crossing, navigate around topographical features, or else, because the surveyors had made a mistake requiring correction.⁶⁵² He has further argued that one can establish the direction of a survey by studying the lines of visibility at points where there is a change of direction. Since the landscape has changed considerably since Roman times, this argument seems somewhat speculative. Even so, Poulter and Quilici do seem to have shown that the Romans established long-distance alignments for their roads, which can be described using geometry.

This use of geometry to create paths of movement, like other acts of surveying discussed in the previous chapters, represents an intellectual abstraction and transformation of the landscape formed by an embedded intersection between the theoretical principles of Euclidian geometry and the concrete reality of the world created by the lived experiences of surveyors.⁶⁵³ Put simply, it was the transformative actions of the surveyors, driven by the principles of Hellenistic mathematics and theoretical geography which structured the physical environment created by Roman conquest and occupation.

In light of these philosophical and archaeological observations, it should perhaps not be a surprise that Balbus chose to focus on the application of geometry to surveying in his writings. In what Jean-Yves Guillaumin, Eric Bohlin and Courtney Roby have argued was direct engagement with the writings of Euclid and Hero of Alexandria, Balbus devotes a great deal of space in his work to the categories and functions of lines, angles and geometric shapes by juxtaposing abstract *formulae* against concrete examples from daily life to embed mathematical theory in the practical realities of the surveyors' working world.⁶⁵⁴ This would tend to suggest that Balbus' description of the narrowing of a wide section of the road works to a point using the *ferramentum* should

⁶⁵¹ Quilici (2008), 560; Poulter (2009), 4-6, 10.

⁶⁵² Poulter (2009), 10-12, 22-25.

⁶⁵³ Guillaumin (1994), 281-284, 289-291; Roby (2014), 11-12, 25, 44-46; Chapter 4 above.

⁶⁵⁴ Guillaumin (1994), 281-283, 290; (1996), 8, 10-11, 14-15; Bohlin (2013), 12-15, 22-26; Roby (2014), 38-46.

be considered a reference to the construction of the Roman roads into Dacian territory using the Euclidian principles of congruent right triangles.

While the works of Guillaumin, Roby, Lewis and Poulter show the theoretical interface between mathematics and surveying on the ground, explaining how surveyors laid out Roman roads, but identifying exactly what type of road Balbus was describing, they present a real challenge for archaeology. The roads which have been uncovered thus far tend to be formed by stone or earthen embankments, functioning as a curb line with side paths for foot traffic, a centre trench and a gravel, or gravel and stone, fill that acts as surfacing.⁶⁵⁵ Such roads, however, represent the built up infrastructure at the core of the Empire and do not seem to reflect what Balbus had in mind when he drafted his narrative. A panel from Trajan's Column (Fig. 4.3), shows that *classiarii* or *axmen*, possibly drawn from the fleet, were deployed by the legions to clear a path through the trees in the densely wooded mountains of *Dacia*.⁶⁵⁶ They may have also been deployed in the same capacity in other similar situations such as the Danish peninsula or the mountains of Africa.⁶⁵⁷ Some of these pathways may have been little more than dirt tracks, but an inscription from Trentino-Alto Adige in northern Italy, dated to 46 AD, proves that many temporary lines of communication cut by surveyors during military campaigns could leave a lasting impression:

Tiberius Claudius Caesar Augustus Germanicus, Chief Priest, (holding the tribunician power for the 6th time, designated Consul for the 4th time, (hailed as) Emperor for the 11th time, Father of the Fatherland, paved the *Via Claudia Augusta*, which his father Drusus had driven through the Alps during the war to open them up, from the Po River to the Danube River, for a distance of 350 miles.⁶⁵⁸

This inscription records how Claudius finished the military roads cut by the younger Drusus 33 years earlier. It shows that military roads were not paved and that in some cases they could retain their unpaved character for decades. More interestingly, when the text of this inscription is read with the text of Balbus quoted above, it becomes clear that Roman military campaign roads were composed of an unpaved central section

⁶⁵⁵ Jackson (2002), 55-58; Quilici (2008), 556, 567.

⁶⁵⁶ Hyg. *De Mun. Cast.* 24; Rossi (1971), 180.

⁶⁵⁷ Plin. *HN.* 2.167; 5.14; 6.38; Aug. *RG.* 26.4; Tac. *Germ.* 34; Dio. 55.10; Nicolet (1991), 85, 87; Baatz (1991), 174-176; Grane (2007a), 9-10; (2007b), 86-89; (2013).

⁶⁵⁸ App. 3.22.

with shallow trenches on either side which were topped by high embankments studded with surveyors stakes to prevent the enemy from cutting the road as happened to Varrus during his march through Germany.⁶⁵⁹ In order to help civilian contractors supply the legions or transport booty back from the campaign as demonstrated by both archaeology and panels from Trajan's Column, roads may have been provided with a partial surfacing of sand and pebbles by the soldiers in some instances.⁶⁶⁰

Regardless of whether the roads were a simple dirt cutting or paved with sand and pebbles, such roads would leave very little trace in the landscape, unless someone like Claudius or Trajan undertook to provide a more substantial paving. Indeed, even when proper stone paving and milestones were provided, it can still be difficult to trace the course of the legion's advance.⁶⁶¹ This state of affairs is exemplified by the fact that modern scholars still cannot agree upon the exact route the Roman legions followed into *Dacia*, even though an inscribed milestone from *Aiton* (Fig. 4.4) shows that Trajan had the roads measured and paved immediately following hostilities.⁶⁶²

4.5 Balbus, the Legions and a Bridge for Conquest

Following on to his description of the Roman road into *Dacia*, Balbus, in the second of his three *exempla*, chronicles another key index of tactical movement for the Roman legions, the measurement of a ford used to cross a river:⁶⁶³

Now as it pertains to the measurement of bridges, we were able to fix the width of rivers from the near bank even if the enemy wished to prevent us from doing so.⁶⁶⁴

River crossings were dangerous. There were a finite number of places where the water was shallow enough to get across and many were only accessible at slack water, making it difficult to transport heavy baggage and artillery.⁶⁶⁵ To cope with the problem, the Romans may have used pre-existing bridges, since many other peoples

⁶⁵⁹ Tac. *Ann.* 1.48-52, 1.56.1, 12.20.

⁶⁶⁰ Coulston (2001), 110, 112, 118, 123; Levaux (2003b), 45; Quilici (2008), 568; Poulter (2014), 25-26.

⁶⁶¹ Kolb (2004), 141, 144-147, 151-152.

⁶⁶² Fodorean (2013), 6, 33.

⁶⁶³ Coulston (2001), 124-128; Ingate (2013), 136-138; Bekker-Nielsen (2014), 140-143.

⁶⁶⁴ Balb. *Ad Cels.* 2000.204.23-24.

⁶⁶⁵ Dumont (2011), 50-51; Bekker-Nielsen (2014), 142-144.

built them, although as Anne Dumont observes, few bridges predating the Roman imperial period have been found because of problems in preservation.⁶⁶⁶ Regardless of whether or not native bridges were available for use, the Roman army was equipped to create its own river-crossings and Balbus is clear about the tactical advantage surveying gave the Roman legions in such operations. As Serafina Cuomo observes, the principles of mathematics, transposed onto the reality of the landscape through the practice of surveying allowed the Romans to quantify and know the limits of the river, thereby restructuring the tactical space of a crossing and asserting control over it.⁶⁶⁷

Balbus does not elaborate on the methods employed to acquire this knowledge, however, just as he does not provide details on the methods he used to survey the roads he constructed in *Dacia*. His brevity here is perhaps in part because such mathematical calculations were discussed in the body of his work and he only sought to provide a general practical example in his introduction.⁶⁶⁸ It is also doubtless, however, due to the fact that the methods used to calculate the width of a river were common mathematical exercises for those who studied the more advanced aspects of geometry. This point is illustrated by the fact that no fewer than three known authors discuss an early identical formula for calculating the width of a river: Hero of Alexandria, the second-century Roman surveyor Marcus Junius Nipsus and the third-century Christian author Julius Africanus.⁶⁶⁹

Like the calculations for the layout of a road discussed above, the formula depended on the use of fixed points and the creation of right triangles drawn out as straight lines projected on to the ground using either the *dioptra* (Fig. 2.6) or the *groma* (Fig. 4.5).⁶⁷⁰ Once measurements were made with one of these instruments, a surveyor would have worked with others to build a bridge in much the same manner that Nonius Datus worked with auxiliary soldiers to dig the aqueduct tunnel at *Saldae*.⁶⁷¹ As several sources show, architects, carpenters and mechanics are well attested in the Roman army.⁶⁷² Unfortunately, there is not enough evidence to reconstruct the exact

⁶⁶⁶ Dumont (2011), 50-51.

⁶⁶⁷ Cuomo (2000), 190-193, 198-199.

⁶⁶⁸ Bohlin (2013); Roby (2014), 40-41, 44-48.

⁶⁶⁹ Bouma (1994), 17; Lewis (2001), 56, 97; Cuomo (2002), 166.

⁶⁷⁰ Herr. *Dioptr.* 9; Nips. *Flum.* 1994.67.3-28; Afr. *Cest.* 15; Lewis (2012), 134-135.

⁶⁷¹ App. 3.34.

⁶⁷² Ter. Pat. *Dig.* 50.6.7; CIL 6.6283; 6.6285; 7.1065; 8.2850; 13.7945.

relationship between these technicians, but the surveyors probably measured and assessed a site while architects and other related craftsmen took responsibility for the actual construction.⁶⁷³ In addition, based on a passage of Josephus discussed more fully below, labor for the survey and construction of roads, bridges, military encampments and related structures was probably formally organised into a hierarchy with a predesigned division of labor, which employed prefabricated plans similar to those used for the construction of Roman camps.⁶⁷⁴ If this was so, it would support Roger Ulrich's recent contention that constructing a wooden bridge would not have posed much of a challenge for the Romans, since axmen and carpenters could cut and shape timbers in the field so long as there was a readily available source of wood.⁶⁷⁵

Documenting the results of this military bridge-building, depicted on Trajan's column, is not easy, both because of the perishable nature of wood, and because as John Poulter has remarked, most temporary bridges were replaced with more permanent structures when the planning alignments for a road were consolidated in order to provide a permanent surfacing; an observation that marks the difference between a Roman incursion into foreign territory and the creation of a province.⁶⁷⁶ As indicated above, the creation of a province will be discussed more fully in the second half of the chapter. Here it is enough to recognise that two different types of wooden bridges can be identified from archaeological remains and the Column of Trajan.

One type was the pontoon bridge constructed of boats lashed together (Fig. 4.6), which provided a temporary avenue of advance, securing Roman territory from easy attack from the far bank of a river.⁶⁷⁷ The second type was a more permanent single-span bridge built on pilings, sunk into the riverbed to support a wooden frame with plank decking and open-work balustrades (Fig. 4.7).⁶⁷⁸ These timber bridges, though more modest than Trajan's well-known stone edifice (Fig. 4.8), were nonetheless monuments of Roman power, which structured the landscape and conveyed specific political and cultural messages just as monumental statues, tombs and buildings did in

⁶⁷³ Col. *RR.* 5.1.3; Vit. *De Arch.* 6.5.51; Cic. *Ad Fam.* 9.2.5; DeLaine (2000), 123-125; Francese (2007), 144-145.

⁶⁷⁴ App. 3.34, line 56; Jos. *BJ.* 3.115-121; Veg. *Mil.* 2.7.6-9; 3.8.4; Vit. *De Arch.* 1.2.1-5; Aul. Gel. *NA.* 19.10.3; O'Connor (1993), 61-62; Delaine (2000), 137, nos. 19-20.

⁶⁷⁵ Ulrich (2007), 75.

⁶⁷⁶ Poulter (2009); (2014), 25-26.

⁶⁷⁷ O'Connor (1993), 133-137; Coulston (2001), 125.

⁶⁷⁸ Coulston (2001), 124; Ulrich (2007), 73-74; Wilson (2008b), 345.

the heart of the Empire.⁶⁷⁹ Instead of negotiating a dialogue about status, power and standing within society, the wooden bridges probably, at least at first, induced a sense of violation and domination similar to that which Gwyn Davies has ascribed to siege works.⁶⁸⁰

4.6 Balbus and the Victory of Mathematics in Siege Warfare

In his third and final *exemplum* of military surveying, Balbus, in one of the rare passages that mention levelling in the *Corpus Agrimensorum*, states that exact topographical knowledge and the surveyor's divinely inspired ability to obtain it were essential for the Romans to transform the tactical space of a battle field and achieve success in war:

Then, with the blessing of the gods, that science showed us a way for us to work out the height of mountains that needed to be stormed.⁶⁸¹

While this passage reaffirms the idea that Roman conquest depended upon topographical knowledge based on quantifiable data, and buttresses the opinions of Kate Gilliver and other experts about the importance of surveyors in a siege, it is even less informative about the surveyors' activities than the previous two passages.⁶⁸² Fortunately, Josh Levithan in his recent study of siege warfare has developed a method for discussing the Roman siege, which can be termed the 'siege progression'. Levithan describes the progression as being like a set of ratcheting gears whose tension increases with every turn until the pressure is released like a spring through the storming of the city.⁶⁸³ This highly mechanical analogy provides the clearest expression of a system for looking at the role of surveyors in siege craft, since Levithan's progression breaks a siege down into a series of phases where the surveyors' craft can be identified.

⁶⁷⁹ Ando (2000), 209-215, 271-292; Patterson (2000), 264-280; Borg (2011), 53-68; Ingate (2013), 138-144.

⁶⁸⁰ Davies (2001), 71-73; Gilliver (2007b), 148; Dumont (2011), 49; Campbell (2012), 218-219.

⁶⁸¹ Balb. *Ad. Cels.* 2000.204.25-26.

⁶⁸² Faudot (2006), 116; Le Bohec (2006), 135-141; (2009), 60-62; Gilliver (2007b), 147-148; Caballos Rufino (2011), 186, 193; Gordon Peral (2011), 212, 218-219, 220-223.

⁶⁸³ Levithan (2013), 48-49.

1) *Stage One: The threat of destruction.*

During the first and second stages of Levithan's progression, the army approached its target city, made a demonstration of its strength, intended to intimidate the defenders into surrender, and launched a probing assault to test the defences.⁶⁸⁴ During these preliminary manoeuvres the only point at which a commander might have employed surveyors seems to have been in the layout and construction of field camps from which operations could be conducted.⁶⁸⁵ A series of four texts link the surveyors to this task, both in the context of the siege and as part of general military field operations. In a frequently quoted passage of the *De munitionibus castrorum*, Hyginus states:

In the entrance way to the middle section of the Praetorian is the spot called 'The Place of the surveyor's cross' (*locus gromae*), either because a crowd congregates at that spot or else because, in accord with the established rule for taking measurements, the surveying cross (*groma*) is set up at the top of an iron pole (*ferramentum*) on the very same spot so that the gates of the camp make a star in accord with the sighting lines. And the masters of this art are specifically called land surveyors (*gromatici*) for the reason explained above.⁶⁸⁶

The idea that surveyors created the camp from a central point fixed by the *groma* is supported by an inscription dated to the reign of Gallienus found at *Lambaesis*, which identifies the monumental courtyard, or *forum* area, in front of the praetorian as the *groma*; a designation which may indicate that the *groma* had fallen out of use as a surveying instrument.⁶⁸⁷ Further support comes from a passage in the *Corpus Agrimensorum* where the author ties the creation of the ideal Roman colony to the creation of a Roman military encampment by explaining that both should be created using the same geometric method to generate a grid from two interlocking streets.⁶⁸⁸ While only a few examples of colonies, such as Colchester, developed from a military encampment and many colonies were never fortified, the author of this passage generated a philosophical continuum in which the first could evolve from the second in

⁶⁸⁴ Gilliver (2007a), 10-14; (2007b), 148; Levithan (2013), 56-58, 61-62.

⁶⁸⁵ Davies (2006); Dobson (2008).

⁶⁸⁶ Hyg. *De Mun. Cast.* 12.

⁶⁸⁷ App. 3.43; Lewis (2001), 323.

⁶⁸⁸ Hyg. *De Con. Lim.* 2000.142.31-36 = 2005.6.6-8.

much the same way as the temporary roads considered above gave rise to permanent imperial highways.⁶⁸⁹

The contention seems to be predicated on two points which are important for this study. The first is the rhetorical argument which existed at least from the time of Cicero in which the martial character of the colonies contributed man-power to the Roman legions while providing a bulwark in defence of the Roman heartland.⁶⁹⁰ Secondly, and perhaps most importantly, there is the fact that the organisation of space and its use in both the colony and camp was articulated along mathematical lines using a plan or map. As has already been discussed in the course of this study, land attached to a colony and its ownership was articulated both publicly and privately through the creation of a *forma* or ground plan, which rendered space graphically using a measured grid.⁶⁹¹ In a similar vein, Vegetius in two separate passages informs us that the surveyors were responsible for providing living quarters for the troops by designing an encampment using geometry and a *podismus* or predesignated ground plan.⁶⁹²

The exact nature of this document remains the subject of debate, but two recent assessments by Alexander Richardson and Brian Dobson suggest that it was a document containing precepts based on mathematics, probably Euclidian, geometry and a table of square roots, which could be used to enclose an area of land within a temporary rampart.⁶⁹³ Evidence from the *De munitionibus castrorum* suggests both that there were a variety of methods for laying out a camp and that each *podismus*, like an architect's or surveyor's *forma*, was crafted for a specific situation using a mixture of text and graphics to help surveyors apply their information in the field.⁶⁹⁴ There does seem to have been a distinction, however, between the composition and function of these documents, which the Romans themselves may not have always recognised. The *podismus* and architect's *forma* seem to have guided the introduction of man-made

⁶⁸⁹ Crummy (1999); Campbell (2000), 189-191; Guillaumin (2005), 188, no. 115.

⁶⁹⁰ Patterson (2006a), 191-199.

⁶⁹¹ Hyg. *De Lim.* 2000.88.10-21 = 2010.2.48-49; Gorges (1993), 8, 11, 13-15; Christol (2006), 85-86; Faudot (2006), 116; Dubouloz (2012), 96; Chapters 3 and 4 above.

⁶⁹² Veg. *Mil.* 2.7.6-9; 3.8.3-4; Hyg. *De Mun. Cast.* 21.

⁶⁹³ Richardson (2004); Dobson (2008).

⁶⁹⁴ Compare: Phil. Byzan. *Pneum.* 18-20; Athen. *Mech.* 39.7; Hyg. *De Mun. Cast.* 15, 25; Veg. *Mil.* 3.8.3-4; Vit. *De Arch.* 1.2.2; Hyg. *De Const. Lim.* 2000.158.26-34 = 2005.17.1-5; Netz (1999), 14-19, 26-38, 51-63; Campbell (2000), 277-281; DeLaine (2000), 124; Acolat (2005), 10-18; Bogen (2013), 280-281, 284-286.

features, while the surveyor's *forma*, like the *forma sensualis*, principally recorded features of the landscape as part of the discourse over ownership and control.⁶⁹⁵

Interpreting the actual application of a *podismus* to the construction of siege camps and other structures, like the interpretation of the surviving surveyors' *formae*, is problematic. Both Brian Dobson and Rebecca Jones have observed that while the remains of internal features unearthed at sites such as *Numantia*, *Masada*, *Inchtuthil* and *Kintore* can match the descriptions provided by the classical sources, more often than not they tend to diverge wildly from what modern scholars consider to be the theoretical model of camp design.⁶⁹⁶ This may not be the problem that scholars sometimes make it out to be, however, since a close reading of the text suggests that the author was primarily interested in providing a theoretical ideal rather than strict practical proscriptions, and only provides suggestions for how to organise individual sections of a camp depending upon the presence or absence of a specific type of unit.⁶⁹⁷ If this interpretation is correct, then it was not so much the structure of the camp itself which posed a threat at the start of a siege, but rather the act of surveying and entrenchment which transformed the tactical space around a city and functioned as an assertion of control.

2) *Stage Two: Lines of Circumvallation and Isolation.*

When a city held out against the threat provided by the camps and the commander's initial probing attack, then the siege would launch the third phase of Levithan's progression. In this phase, the camps constructed for housing the army would be extended with straight lines connecting fixed points in the landscape to form a series of trenches, walls, artillery emplacements, and watch towers.⁶⁹⁸ These fortifications, which incorporated many of the elements described as boundary markers by Siculus Flaccus, functioned as an inversion of the normal civic boundary line of territorial integrity,

⁶⁹⁵ Compare the references in the previous note with: Front. *De Art. Mens.* 2000.8.30-33 = 2005.3.2; Hyg. *De Cond. Lim.* 2000.88.10-21 = 2010.2.48-49; Sic. Flac. *De Cond. Agr.* 2000.78.24-32 = 2010.2.2; Sic. *De Divis. Et Ass.* 2000.120.22-32 = 2010.4.2-4; Chouquer (2007), 15, 18; Maganzani (2007), 6-9; Lewis (2012), 129.

⁶⁹⁶ Dobson (2008); Jones (2011), 54-55.

⁶⁹⁷ Hyg. *De Mun. Cast.* 9, 10, 14, 15, 23, 25, 30, 32, 37, 40, 45-47; Jones (2011), 54-55.

⁶⁹⁸ Compare: Davies (2006); Le Bohec (2006), 136; (2009), 61-62; Levithan (2013), 63-74.

stripping a community of its independent identity by transforming a familiar extramural area into a hostile and forbidding landscape.⁶⁹⁹

To maximise the intimidation factor in this line of circumvallation, as Gwyn Davies has argued, the Romans sometimes over-engineered their lines of envelopment in order to articulate a clear message of power and control.⁷⁰⁰ By creating lines of circumvallation that interacted with and dominated the landscape, such as those at *Masada*, the Roman surveyors, as Davies has argued, could create a hardened boundary to isolate the enemy and induce feelings of despair which would contribute to a quick victory.⁷⁰¹

3) Stage Three: *The Engineered Assault.*

During the final stages of the siege progression, when the Roman commander concentrated all his efforts on the forcible reduction of a city rather than its capitulation, the surveyor's craft came into its own assessing physical features for the construction of mines and siege ramps. The inscription set up by Nonius Datus at *Lambaesis* shows that levelling surveyors were versed in assessing mountain heights and possessed the necessary managerial skills to direct the labor force involved in creating mines and tunnels through them.⁷⁰² However, the Romans considered mining to be a dangerous and unreliable method of storming a fortress and employed it only as a last resort.⁷⁰³

Their primary method of attack was to go over the wall using an *agger* or siege ramp.⁷⁰⁴ However, the construction of siege ramps was a complicated matter, since, as Gwyn Davies has remarked, in order for a ramp to be effective it has to have just the right gradient across the available open space so that engines can be winched up, while being just the right height to allow men to storm the enemy's fortifications.⁷⁰⁵ Equally, if the ramp was constructed too close to the wall, falling masonry could clutter up the

⁶⁹⁹ App. 4.17; Jos. BJ. 5.446-459; Hyg. *De Cond. Agr.* 2000.78.21-32 = 2010.2.1-2; Sic. Flac. 2000.78.33-80.4 = 2010.2.3-4; Guillaumin (2010), 80, no. 3; Davies (2011), 62, fig. 1; Ando (2012b), 113-114.

⁷⁰⁰ Davies (2001), 71-76.

⁷⁰¹ Davies (2001), 71-76; Purcell (1983), 194-195; Levithan (2013), 63-65.

⁷⁰² App. 3.34.

⁷⁰³ Davies (2006), 118-124; Francese (2007), 150; James (2011), 298-299; Levithan (2013), 71-72.

⁷⁰⁴ Davies (2006), 118-121; Levithan (2013), 71-72.

⁷⁰⁵ Davies (2006), 99-101.

path of the assault force even as it crushed rams and the men working them. Assessing the best site and line for such a ramp required a good eye for terrain, as well as mathematical know-how. It also represented a direct conflict of authority with the military commander directing operations, since classical texts make it clear that the choice of where and how to attack were exclusively the prerogative of the general.⁷⁰⁶

In this respect, the design of a siege ramp was likely to be a situation similar to the creation of a boundary line during a dispute or the creation of an aqueduct like the one at *Saldae*. Surveyors had to publicly demonstrate deference to their military superior while making sure that the general recognised the surveyor's superior technical abilities; an exercise requiring all the rhetorical skill discussed in Chapter Two above.

It is difficult to assess the extent to which plans similar to those used in the construction of the camp may have influenced the surveyor's discourse with his commanding officer, or the extent to which they may have structured the design of siege ramps, since the only reference to such theoretical documents are the passages in Hero which provide the formula for assessing height and the raising of a mound, and the plans drafted by the military leveller Datus for the construction of the aqueduct at *Saldae*.⁷⁰⁷ Recent experiments using a reconstructed *dioptra* to assess the height of a wall, however, have shown that the system of right triangles described by Hero, and which may have been discussed by Balbus too for establishing both distance to and elevation of a city wall, were accurate at the remarkable distance of up to three hundred meters.⁷⁰⁸ By contrast, Hero's rather vague formula for calculating the dimensions of the mound itself, seem to have involved the use of interlocking equal parallelograms and the creation of vertical arcs from right triangles:

Let the site be **ABΓΔ** and its centre be **E**. Through **E** lay out with the dioptra as many lines as you like, such as **ΑΓ**, **ΒΔ**, **ΖΗ** and **ΚΘ**, and plant vertical stakes along them. Our instructions for one line apply to all the rest. Plant **ΒΔ** with stakes at **ΑΜ**, **ΝΞ**, **ΟΠ**, **ΡΣ** and **ΤΥ**. Set the disc of the dioptra vertical, with **ΦΧΨ** corresponding to the segment of the mound. Stand a rod **Ως**, in the same way [as described in chapter 17 of Hero's work] so that the lines of sight from **Ω** to **Φ** and **Ψ** coincide when projected with **Β** and **Δ**. Sight from **Ω**, past the circumference **ΦΧΨ** to the points **Μ**, **Ξ**, **Π**, **Σ** and **Υ**

⁷⁰⁶ Levithan (2013), 8-10, 74.

⁷⁰⁷ Her. *Dioptr.* 12-13, 18.

⁷⁰⁸ Lewis (2012), 139.

on the stakes. These points lie on the segment of the curve. Plant stakes on the other lines, sight on them and, when the stakes have been marked, mound the site up to the marks. The mounding will correspond to the segment of the sphere.⁷⁰⁹

Several papyrological documents along with passages from the *Corpus Agrimensorum* and their Medieval illustrations, show that the creation of circles from squares was frequently carried out by surveyors when calculating the area of an irregular plot of land, and it may have even been a common classroom activity for those doing more advanced mathematical studies.⁷¹⁰ In addition, a section of Balbus' work that has yet to be fully edited, deals with the creation of rectangular figures from two or more interlocking circles.⁷¹¹ It is important to note that none of these examples involve the creation of an arc from a right triangle in the context of constructing a vertical surface, but given Balbus' reference to the calculation of mountain heights in his introduction, it is likely that the lost portion of his text included a discussion of this topic and the mathematical formulae involved.

Unfortunately, the only surviving examples of siege ramps against which one can study the theoretical model set out in the text come from the sieges at *Avericum* (50 BC), *Machaerus* (72 AD), *Masada* (74 AD), *Sarmizegethusa* (106 AD), *Cremna* (third century) and *Dura Europos* (256 AD). While mathematical calculations are evident in all of these examples, there is so much variation in the gradient of each, with the shallowest rising one meter in seven and the steepest rising one meter in three, that a unifying algorithm for calculating construction is hard to find.⁷¹² This problem, like the problems in finding the *podismus* in the Roman camps discussed above, is probably a result of a limited sample and the need to accommodate the local topography during building.

Even so, each *agger* was built with one of two basic methods. They were either composed of compacted earth and stone using a dump-fill method or else a wooden frame was built with hurtles to contain spoil in what might be termed a box-construction

⁷⁰⁹ Her. *Diopt.* 18; translation adapted from Lewis (2001), 276.

⁷¹⁰ Front. *De Art. Mens.* 2000.12.3-29 = 2005.4.1-2; Hyg. *De Cond. Agr.* 2000.82.1-16 = 2010.2.17-22; Guillaumin (1994), 287-291; Jones (2009), 342.

⁷¹¹ Bohlin (2013), 9-26; Roby (2014), 37-39.

⁷¹² James (2004), 32; Davies (2006), 108, 110-111; (2011), 76-77.

method depending on the available materials.⁷¹³ The danger and backbreaking labor involved in constructing such ramps, and in conducting a siege in general, leads me to agree with Josh Levithan when he argues that the Romans preferred to engage an enemy openly on the field of battle rather than through a siege.⁷¹⁴ A siege represented an extreme effort at subjugating the inhabited landscape through applied geometry and brute force in ways that went far beyond the construction of roads and bridges. The Romans only undertook such a dramatic and violent transformation of both the topographical and human landscape when the inhabitants refused to diplomatically recognise the might of Rome and yet resisted Roman domination without fighting openly on the field of battle.⁷¹⁵

The implicit knowledge gap between the theoretical concepts, found in literary texts and the engineering works that made such a transformation possible, reflects both Roman administrators' need for technically competent subordinates and the expectations placed on those experts by technical authors.⁷¹⁶ Technical literature such as the *Corpus Agrimensorum* and the writings of Hero were unquestionably intellectual documents intended to entertain and enlighten any well-educated reader, but technicians were also clearly expected to be able to bridge the gap between the theoretical concepts of the texts and their practical application to a specific situation through hands-on experience.⁷¹⁷ Since it is very unlikely that the majority of even well-educated individuals in antiquity possessed the prerequisite experience and mental organisation to create siege works from the textual examples known, it is worth considering just how common it was for a Roman army to have surveyors on hand who might possess this sort of knowledge.

Such consideration is even more important when examining the text of Balbus, since Floran Fodorean has recently suggested that Trajan placed Balbus in charge of all engineering works in *Dacia* as a prominent member of the Praetorian Guard.⁷¹⁸ In order to do this, however, and in order to further assess the impact of surveying operations on

⁷¹³ Davies (2006), 101-104, 106-112.

⁷¹⁴ Levithan (2013), 49-50, 63, 75; *contra* Le Bohec (2006), 135 ; (2009), 61.

⁷¹⁵ Levithan (2013), 6-7; Lavan (2013), 97, 156-158, 164-166, 176-178, 181-182, 186, 216, 245-248.

⁷¹⁶ Cuomo (2011a), 173-180; Bogen (2013), 281-286; Netz (2013), 239-242; Thiering (2014), 265, 268, no. 3, 279-280.

⁷¹⁷ Campbell (1996), 79; Cuomo (2002), 174-176; Curtis (2009), 66-70; Roby (2014), 12, 22-29, 33, 41; Thiering (2014), 266, 269, 271, 277-280.

⁷¹⁸ Fodorean (2013), 15-16.

the development of the Roman Empire in the second half of this chapter, it will be necessary to leave the text of Balbus behind and consider other avenues of evidence.

4.7 *Mensores Militum*: Surveyors in the Roman Army

While the text of Balbus shows the surveyors' ability to restructure the landscape while on campaign, it does not indicate how many men were involved or their place within the Roman legions. The speed and success with which Roman surveyors could transform the landscape, both at the tactical level of an army on campaign, and at the strategic level when organising a province, depended upon the number of surveyors and surveying assistants available and their position within the Roman army. It is only a passage of Josephus that provides a vivid picture of how the Romans organised manpower to modify or otherwise cut roads during a military campaign. In the third book of the *Bello Iudaico*, Josephus narrates the march of Vespasian from *Ptolemais* to *Gabara* and then on to *Jotapata* by first stating:

Vespasian, eager to invade Galilee himself, set out from *Ptolemais* after drawing up the army in the accustomed Roman marching order. He ordered the auxiliary lightly-armed troops and the archers to go in advance, so that they might both prevent any sudden attacks by the enemy and investigate woodlands that were suspicious on account of their suitability for an ambush. And next, followed a body of heavily-armed Roman soldiers, both infantry and cavalry. After these troops marched ten men from each century carrying their own equipment and the implements for marking out the camp. And after these came the engineers who were to straighten bends in the road, level rough areas, and cut down woodland which was blocking the way, so that the army would not be exhausted by a difficult march.⁷¹⁹

This description of a Roman marching column closely reflects the organisational principles for road construction discussed above, and while Josephus does not specifically mention the surveyors, the ten men he states were selected from each century to go in advance with the tools for marking out the camp were probably the *metatores* or camp technicians who Frontinus, Vegetius and the author of the *De munitionibus castrorum* describe as being responsible for selecting and laying out a camp site under the direction of the surveyors.⁷²⁰

⁷¹⁹ Jos. *BJ.* 3.115-126.

⁷²⁰ Hyg. *De Munit. Cast.* 12, 37, 46; Front. *Strat.* 2.7.12; Veg. *Mil.* 2.7.6-9, 3.8.3-4.

According to Robert Sherk's interpretation of the available evidence, each legion possessed eleven surveyors, with two surveyors serving in the first cohort, which was of double strength, and one surveyor in each of the other nine.⁷²¹ He further argued that each of the nine praetorian cohorts also had its own surveyor, providing the emperor with independent technical support. As Brian Campbell has pointed out, however, the inscriptions Sherk used for his reconstruction date to the third century AD and reflect specific moments in the history of two particular legions, which may not reflect the situation at other times and places.⁷²² Campbell's own assessment, based mostly on a reading of the monument set up by Nonius Datus, was that surveyors were quite rare with many legions and imperial administrators not having access to any at all.

In both of these interpretations, the fundamental problem is a lack of qualification. As was pointed out in an earlier chapter of this study, there were four subdivisions of the surveyors recorded in the epigraphic record, and three of them are attested in both Praetorian and legionary cohorts: the land surveyor or *agrimensor*, the levelling surveyor or *librator*, and the cartographic surveyor or *chorographiarii*.⁷²³ In keeping with the general demographic trends outlined in the second chapter, the land surveyor seems to have outnumbered the other two groups in the Roman army. However, four factors make assessing the number of surveyors in the Roman army in absolute terms all but impossible. First, a strict formal system of self-identification does not seem to have ever been introduced for the surveyor in the Roman army. While some surveyors took pride in identifying themselves as a *ensor librator*, for example, most simply styled themselves as *ensor* without specifying their technical competency. In addition, even when surveyors identified themselves by technical competency, the abbreviations they used were ambiguous and can be confused with other occupations. This is particularly true of the *librator*, since the abbreviation "*lib.*" could also stand for the Latin word *librarius*, unless prefixed by the notation *men* meaning *ensor*.⁷²⁴

Third, quantifying the number of surveyors present in the Roman army is complicated by the fact that *ensores* seem to have been introduced to auxiliary cohorts of citizen soldiers beginning in the last quarter of the first century, and in peregrine

⁷²¹ App. 3.9, 3.44; AE 1992.1872; Breeze (1969), 54-55; Sherk (1974), 547-549; Frere (1980), 67.

⁷²² Campbell (2000), 'Introduction', LI, no. 156.

⁷²³ App. 3.19, 3.21, 3.23, 3.25, 3.26, 3.28, 3.34; Lewis (2012), 131.

⁷²⁴ Cuomo (2011b), 159, no. 82; Martinez and Finn-Senseney (2013), 403-404.

cohorts before the end of the second.⁷²⁵ At the very least, surveyors and their apprentices were present in *Cohors XX Palmyrenorum* at *Dura Europos* in 239 AD, where archaeology shows their proficiency in both strengthening the city's defences and later in countering the Persian siege mines.⁷²⁶ Since documentation for most auxiliary units is only partial at best, it is impossible to say just how many of these units had surveyors, and when.

But the most significant problem in establishing the presence of surveyors in the Roman army is simply the fact that not all surveyors identified themselves as such. Contrary to the views of Michael Speidel, surveyors, who served in the legions as *immunes*, seem to have used their position and their specialised skills to earn advancement to the rank of *optio* or centurion, at which point they identified themselves by rank rather than by occupation.⁷²⁷ This means that many men who were practicing surveyors cannot be conveniently identified as such in the epigraphic record, unless there are clear indicators in the document to show that the *optio* or *centurion* was carrying out the tasks of a surveyor. Interestingly enough, people outside the legions seem to have understood and followed this practice of identification as well.

Seneca when describing Nero's expedition to explore all of *Ethiopia*, states that the emperor sent just two centurions from the Praetorian Guard to carry out the investigation.⁷²⁸ Presuming that Nero only sent one expedition, these centurions would have been the surveyors who produced a *forma* showing the rout taken by the Praetorian expeditionary force mentioned by Pliny the Elder.⁷²⁹ Seneca's depiction of the journey, as undertaken by just two surveyors, may reflect his ambivalent feelings about imperialism and exploration beyond the accepted bounds of the inhabited world, but it also probably reflects the true state of most surveying operations in which a finite number of technical experts were available to accomplish a great deal.⁷³⁰

⁷²⁵ App. 3.46, 3.48, 3.49; Reynolds (1980/81), no. 2; Le Glay (1985), 120-122; Haynes (2013), 98-101.

⁷²⁶ PDur. no. 89; Fink (1971), 192-197, no. 50; James (2011), 297-302.

⁷²⁷ Tarr. Pat. Dig. 50.6.7; Kearsley (2000), 140-141, no. 166; Sergejevski (1964), 94-95; Devreker (1971), 359; Speidel (2001), 51-52.

⁷²⁸ Sen. QN. 6.8.3-4; Sherck (1974), 540-541; Nicolet (1991), 86.

⁷²⁹ Plin. HN. 6.181; 12.19; Dio. 63.8.1; Brodersen (2003); Williams (2012), 234-236.

⁷³⁰ Sen. QN. 5.14.2; 5.16.1-5; 5.18.4-14; Romm (1992), 154, 165-167; Inwood (2005), 178.

In general terms, while it is impossible to quantify the exact number of surveyors serving at any given time, the number unquestionably increased steadily from the late first to the early third century AD so that by the death of Alexander Severus they were serving in nearly every branch of the Roman military. At the same time, the overall percentage of serving soldiers who were surveyors remained comparatively small. This means that, while it was possible for Balbus to have been part of the Praetorian Guard, this was not necessarily so, since an active member of such a small group could call himself to the attention of his military superiors by demonstrating outstanding ability regardless of his position. Indeed, the only direct evidence for Balbus' position as part of the Praetorians comes from the fact that he was granted a year's leave to write a book on surveying and his insinuation in the narrative portion of his introduction that his services to the emperor played a significant role in the collection of geographic information used in the incorporation of *Dacia* as a province of the Empire.

4.8 Paths of Knowledge: Facing the Unknown

Assuming that Balbus was being truthful in asserting that the surveyors, with their understanding of Hellenistic geography, were the principal source for the collection of quantifiable information on the location of people and places, the Romans had to carry out their geographic investigations with a limited body of men using the methods outlined above. This introduces two problems. First, there is the problem introduced by N. J. E. Austin concerning the surveyor's ability to collect enough information to establish a viable geographic understanding of a region from a single line of advance, such as the road and river-crossings described by Balbus.⁷³¹

To borrow an observation from the writings of the British anthropologist Tim Ingold, roads created as straight lines in this fashion represent a series of points connected as a network of destinations.⁷³² Such a connected line does not constitute a base for a two-dimensional understanding of the landscape unless it is used as a baseline from which surveyors and their assistants investigated the landscape. Put simply, the Romans had to have a system for distributing the limited number of surveyors and

⁷³¹ Austin and Rankov (1995), 114-116.

⁷³² Ingold (2007), 74-75, 81.

surveying assistants available to an army over a field of operations greater than that occupied by a single column of march without subjecting them to danger. Such a task also had to be accomplished in such a manner that the quantifiable data they collected and the control it represented could, and would, be meaningful for the direct exploitation of an entire region and its population centres.

Secondly, surveyors, regardless of how much land they investigated, had to be able to find their way to and through the places being surveyed. Within the Empire, as noted elsewhere, those who needed to find a destination in the pre-modern world, were confined to consulting a written itinerary when planning their journeys and were obliged to ask members of the local population for directions on route when those itineraries failed to provide the information needed.⁷³³ But, as Caesar's account of his first expedition to Britain shows, itineraries were not always available and information gathered from foreign envoys and local merchants could prove insufficient for establishing a tactical line of advance.⁷³⁴ Therefore, Roman scouts and surveyors, when creating a network of paths and roads in a new territory, like many native hunters seeking game in the wilderness, had to interact with the landscape in order to create the connecting line of the itinerary and find its destinations for the first time.⁷³⁵

4.9 Paths of Knowledge: The Sufferings of a Guide

One effective method for supplementing knowledge found on an itinerary, as well as for navigating through otherwise unknown terrain, both inside the Empire and out, was to acquire the services of a local guide.⁷³⁶ While employing a guide meant that travellers were dependent upon the good-will of an outside person who could become lost himself or lead them into an ambush, the accounts of Nero's expedition to *Ethiopia* clearly show their value, since the praetorian soldiers acquired and employed the services of knowledgeable locals from the king of *Ethiopia*.⁷³⁷

⁷³³ Brodersen (2001), 14-16; Delano-Smith (2006), 46-52; Salway (2012), 188-191.

⁷³⁴ Caes. *BG.* 4.20-21; Plin. *HN.* 6.84-86; Ptol. *Geog.* 1.1.5; Austin and Rankov (1995), 60-61, 98-99; Schadee (2008), 159, 162, 171-172.

⁷³⁵ Ingold (2007), 76-79, 88.

⁷³⁶ Caes. *BG.* 2.16; Str. *Geog.* 1.1.17; Plut. *Cat. Maior* 13; Amm. *Hist.* 16.12.19-21; 17.10.3-6; Austin and Rankov (1995); Hauken and Malay (2009), 332.

⁷³⁷ Sen. *QN.* 6.8.3.

According to Pliny, the Praetorian cohort sent on the expedition was able to travel nine hundred and eighty five miles past Cyrene at the southern border of the Empire, record the distances between major cities along the main line of advance and even produce a *forma* of some sort.⁷³⁸ While Pliny provides a wealth of information, what he included in his discussion on the geography of *Ethiopia* was probably only a fraction of what the *forma* contained and it is not really possible to reconstruct what the document looked like. This is demonstrated by the fact that the distances Pliny reports are far too great for anyone to have covered in a single day. This means that regardless of how the local guides conducted the Roman expeditionary force, there were intervening stages and changes in direction in the journey between the named urban nodes of the itinerary, which Pliny does not discuss.

Pliny states that the main purpose of the expedition was to carry out a reconnaissance for future conquest, and it is very possible that Nero was principally interested in locating the source of gold and ebony that tradition said existed south of the first Nile cataract.⁷³⁹ If this was the case, then it is quite possible that the Praetorian expeditionary force and their guides had orders to investigate the landscape away from the Nile River in spite of the harsh climate in order to locate places where natural resources such as those found in the western desert of Egypt might be obtained.⁷⁴⁰ Such orders might seem implausible, but since the Roman army had access to local guides, dromedaries and surveyors, it was theoretically possible for the Praetorian tribune in command of the expedition to hold the main body of his force in a temporary camp on the banks of the river and, in a manner similar to Agricola's exploration of Scotland, dispatch a small surveying party, led by guides, out into the desert to investigate matters.⁷⁴¹ In this context, it is worth noting here that pits excavated in marching camps from Scotland show that such temporary camps could be maintained for up to five weeks, and a small group of scouts and surveyors carrying food and water on pack animals could, with the help of a local guide, ride in a wide circle gathering a considerable quantity of information during such a period.⁷⁴²

⁷³⁸ Plin. *HN*. 6.181-189.

⁷³⁹ Compare: Herod. *Hist.* 3.114; Plin. *HN*. 6.181-184; 12.17; 12.19; 37.45; Sen. *QN*. 6.8.2-4.

⁷⁴⁰ Gates-Foster (2012), 212-214.

⁷⁴¹ Caes. *BC*. 1.62; Tac. *Ann.* 1.50; Tac. *Agr.* 26; Plin. *HN*. 5.38; 6.101-103; Str. *Geog.* 17.1.45; Fink (1971), 192-197, Doc. nos. 50, 63; Coulston (2001), 112; Adams (2007), 214-215.

⁷⁴² Fink (1971), 192-197, doc. no. 50; Jones (2011), 82-83.

4.10 Paths of Knowledge: Following the Signs

When operating away from well-marked pre-existing travel routes, both local guides and Roman surveyors would have been dependent upon landmarks, astronomical observations and dead-reckoning to work out where they wanted to go and the best way back.⁷⁴³ This would prove particularly true if they expected to lead others back along the same path or create a road for others to follow later. Recently, Martin Thiering has contended that navigation of this sort involved mental modes of implicit knowledge, which functioned as a dynamic, deductive problem-solving process based upon the observation, memory and cognitive reconstruction of specific structural clues within the landscape.⁷⁴⁴ In a world devoid of navigational tools such as the gyro-compass, such problem-solving abilities would have been crucial for anyone seeking to know and transform the landscape on both the tactical and strategic levels described by Balbus and Pliny the Elder, as they provide the only means of navigating through the wider world.

Within this cognitive system, all orientation and directional determinations depend on three points of reference: internal, external and the purely theoretical. Internal points of reference involve the articulation of distance measurements in terms of the traveller's own body using the finger, palm, forearm and foot to approximate size in a world without exact, standardised units of measurement.⁷⁴⁵ In addition, without the absolute source of direction provided by the compass, travellers need to establish directional indicators based on human syntax, such as when a given object is described as being on the right or left hand or, more remotely, by referencing a person or object as being near to a point which is fixed relative to the traveller's own position and point of view.⁷⁴⁶

External points of reference are formed in the mind of an individual traveller through the experience of sensations that start outside the individual and are taken in through the sensory extensions of the nervous system via the eyes, ears, nose and skin.⁷⁴⁷ Where travel and movement are concerned, these external features include

⁷⁴³ Ptol. *Geog.* 1.2.1-3; 1.8.6.

⁷⁴⁴ Thiering (2014), 265, 271, 277-279, 282-283, 296, 300-301.

⁷⁴⁵ Geus (2014b), 147-149; Thiering (2014), 287.

⁷⁴⁶ Kowalski (2012), 91, 95-96, 123; Thiering (2014), 277, 283, 287-288.

⁷⁴⁷ Tilley (2012), 17-18; Thiering (2014), 279.

obvious topographical landmarks such as rocks, rivers, mountains, sun and stars, as well as a broader range of phenomena such as plant and animal life, wind, rainfall, temperature, humidity and the like.⁷⁴⁸ All of these external features function as either visual land marks that are fixed and easy to remember or as cognitive markers, which can be considered as things whose presence or absence along with the degree to which they are present or absent signal a person's location.⁷⁴⁹

The cognitive or purely theoretical frame of reference is formed by an abstract set of understandings, which allow travellers to extrapolate where they are based on known features which are not immediately experienced. A key part of this process is the recognition that one can establish the distance between two unseen places using the movement of a person by measuring the amount of time, usually in relative terms such as days that it takes to go from one place to another.⁷⁵⁰ The movement involved in such calculations is understood strictly in one dimension. A second dimension can be added, however, through the use of known lateral relationships established between two or more objects and/or places which an individual passes by, or between, in the course of travel.⁷⁵¹ In order to make this two dimensional frame of reference function when navigating incommensurable distances, such as those involved in crossing large open bodies of water or the vast waste of the desert, it is necessary to develop a systematic study of the stars and a fixed conceptual or imaginary point of reference. Astronomical observations of specific stars or constellations can be used to establish orientation and track the rate of movement, while fixed imaginary points of reference such as the phantom island used by Micronesian navigators in the south Pacific, can be memorised against any number of known star groups and locations to provide a permanent point of orientation.⁷⁵²

4.11 Paths of Knowledge: Instruments Knowing the Landscape

While these three points of reference are theoretically enough to allow one to navigate through any known or unknown landscape, Hellenistic philosophers added another

⁷⁴⁸ Tilley (2012), 22-25; Kowalski (2012), 86-89, 112-113, 122, 137; Arnaud (2014), 48-54.

⁷⁴⁹ Thiering (2014), 301-303.

⁷⁵⁰ Arnaud (2014), 42-45; Geus (2014b), 148-153.

⁷⁵¹ Kowalski (2012), 91-97; Arnaud (2014), 42-44.

⁷⁵² Kowalski (2012), 86-88; Arnaud (2014), 43-44; Thiering (2014), 295-297.

factor to the human understanding of the terrestrial world by introducing the *dioptra* and portable sundial. The *dioptra*, mentioned above as an instrument for surveying rivers and military fortifications, could also be set up on a tripod in a vertical posture in order to measure the angle between two stars on the same meridian.⁷⁵³ This knowledge could be used to establish one's position along a horizontal axis in a crude approximation of the modern concept of longitude.

By contrast, the portable sundial as described by Vitruvius, if designed the right way, could be used to establish one's latitude.⁷⁵⁴ Derek de Solla Price, using what some consider to be a contentious system of nomenclature, has identified three distinct types of portable dial, all of which he believes were in use by the beginning of the second century AD.⁷⁵⁵ The first type, which he refers to as *viatoria pensilia* (Fig. 4.9), was portable but calibrated to work at only one specific latitude, making it useless for surveying or navigational purposes, since one had to know the latitude one was at in order to make the instrument function properly.⁷⁵⁶ A second type (Fig. 4.10), which de Solla Price refers to as the *pros pan clima*, provides compass-like orientations as well as the time, based on shadow lengths, measured from a *gnomon* positioned on a curved plate.⁷⁵⁷ A third and incredibly complicated type of dial (Fig. 4.11), which de Solla Price identifies as *pros ta historumena*, consists of a series of interchangeable plates that could be slotted into a housing with an aperture through which sunlight could pass. Each of the disks seems to have been marked out with lines that allowed the user to measure time at different latitudes.⁷⁵⁸

In strict terms, while this third type of dial may have been useful to those who travelled, only the second was truly useful while one was traveling, and it is interesting to note that many examples of the second type of dial were calibrated for different latitudes, using the names of Roman provinces as a reference system, showing that people thought about the provinces as places and structured their understanding of the world accordingly.⁷⁵⁹ This is an important point, since such a system of conceptualising

⁷⁵³ Lewis (2012), 141.

⁷⁵⁴ Vit. *De Arch.* 9.8.1; Talbert (2008), 25-26; Lewis (2012), 141.

⁷⁵⁵ De Solla Price (1969), 242-244.

⁷⁵⁶ De Solla Price (1969), 243-244.

⁷⁵⁷ Stebbins (1952), 251-254; de Solla Price (1969), 243-244 and Buchner (1976), 329-336.

⁷⁵⁸ De Solla Price (1969), 244, 249-251; Buchner (1976), 336-341.

⁷⁵⁹ Stebbins (1958), 251-254; Talbert (2008), 26.

the world entails a system of construction, which shapes the identity of each province in strictly quantifiable terms. It also suggests that Roman surveyors had the tools and methodology to quantify the boundaries as well as internal structures of each province and organised those quantified structures in relationship to one another.

4.12 Paths of Knowledge: Roads of Change

A monument that also articulates an understanding of the world in terms of Roman provincial organisation, is the *Stadiasmus Patarensis* (Fig. 4.12). Set up in the harbour of *Patara* by the Lycians in 46 AD, this rectangular monument articulates a clear connection between surveying at the tactical level and the creation of a province's topographical identity by honouring Claudius as ruler of the world and prising him for building roads throughout *Lycia*.⁷⁶⁰

Tiberius Claudius Caesar Augustus Germanicus, son of Drusus, emperor of the *oikomene*, built roads through the entirety of *Lycia* with the services of the pro praetorian legate Quintus Verranius, the distance of which is written out below.⁷⁶¹

On the two sides flanking this inscription (Fig. 4.13), are the sixty-five stages forming an itinerary or list of roads and destinations. Modern maps reconstructing the text of the itinerary (Fig. 4.14) show that the monument assumes the Roman provincial capital of *Patara* as the prime point of orientation and reference for the information presented in the lists. More importantly, as Benet Salway has remarked, the monument describes the road network of the province and its cities from west to east, using six relevant topographical groupings containing thirty separate itineraries rather than a straightforward linear progression.⁷⁶² This means that the authors of the text on the *Patara* monument structured their presentation of information in terms of several key geographic nodes, which collect cities and routes into discrete groups, rather than presenting them as a simple list that progresses from A to B to C. An example of this can be seen at the start of the text where *Patara* and *Zanthos* form the key nodes in the

⁷⁶⁰ Sahin and Adak (2007), 28-32, 78-84; Salway (2007), 195-197; Eck (2009), 82-83; Kolb (2013), 111-112.

⁷⁶¹ App. 4.26, side B lines 1-8.

⁷⁶² App. 4.26; Salway (2007), 197-198.

route which goes from *Patara* to *Xanthos* to *Sidyra* to *Kalabantia* before reverting back to *Xanthos* to describe a route to *Pinara*.⁷⁶³

As a series of recent archaeological investigations has shown, the majority of routes found in the itinerary were formed by short distance alignments defined by the mountainous topography of *Lycia*, which were all measured by surveyors under the direction of the legate Verranius using Roman miles that were then translated into Greek *stadia* for the convenience of the provincial population.⁷⁶⁴ The presence of key nodes in the network and the nature of the distances presented suggest that Roman surveyors and their support staff used specific cities as central nodes or clearing houses for the collection of information on local topography, routes and settlements.⁷⁶⁵ Once the data were collected, they were then gathered into a coherent structure that represented *Lycia* as a topographical compartment containing a group of cities that could be put into context with other similarly organised provincial groupings.

As recent work done on the organisation of colonies and the transportation infrastructure of Roman *Hispania*, *Dacia* and *Britannia* have shown, the pattern of nodes and routes, forming the final structure of the itinerary on the *Patara* monument was not unique to that province. Several studies of the placement of Roman colonies in Spain show that they were located at central strategic points in the regional road network, where they served as central administrative centres in the formation of the provincial *conventus* or administrative districts.⁷⁶⁶ Similarly, Florin Fodorean, in his reconstruction of the Dacian landscape, has shown that there were at least nine major routes forming the Roman imperial road network, with each focused upon one or more key administrative centres, and that the distance measurements used to create the roads were all derived from Roman military travel patterns.⁷⁶⁷

Echoing Fodorean's arguments about the organisation of *Dacia*, aerial photographs taken over much of Scotland and Germany show how Roman temporary

⁷⁶³ App. 4.26, side B, lines 9-14.

⁷⁶⁴ Sahin and Adak (2007), 97-101, 106-110; Onur and Alkan (2011), 66, 69-70, 73-74; Uzunğlu and Taşdelen (2011); Onur and Oktan (2013), 94-99; Kolb (2013), 113-114.

⁷⁶⁵ Salway (2007), 197-199.

⁷⁶⁶ Gorges (1993), 14-16, 22-23; Reis Martines and Carvalho (2010), 283-285, 290-293; Edmondson (2011), 33, 38-46; Caballos Rufino (2011), 186, 188-191; Gordón Peral (2011), 220-223.

⁷⁶⁷ Fodorean (2013), 33-34.

camps dotting the landscape, although oriented using rivers, river valleys and mountain passes without any surviving roads to connect them, nonetheless form corridors of advance which structure the landscape. A map showing the location of temporary camps in England and Scotland (Fig. 4.15) shows how many of these lines of encampment intersect with Roman roads to converge on centralised transit nodes similar to those found in the *Stadiasmus Patarensis*, discussed above.⁷⁶⁸

Sites in Wessex and Shropshire demonstrate that the Romans did not always create new roads, but frequently incorporated local roads into their surveys, even as they used pre-existing settlement sites to establish military fortifications and colonial settlements.⁷⁶⁹ By way of example, during a rescue excavation carried out by Tim Malim and Laurence Hayes at Sharpstone Hill near the village of Bayston Hill, six km north-west of Worcester in 2009, excavators uncovered three layers of cambered road, which intersected an iron-age track-way servicing a line of hillforts. The second road leading to the hillforts seems to have gone out of use at the start of the Roman occupation. However, the cambered road, which was built in the Roman fashion, even though all of its strata were laid down well before the Claudian invasion, formed part of the Roman advance into western Wales and continued to be developed with new municipal features such as *mansiones* and *mutationes* well into late antiquity.⁷⁷⁰

In contrast to this, at Knighton Hill above Bishopstone in Wessex, on route from *Sorviodunum* (old *Sarum*), a Roman settlement established near an iron-age hillfort, Roman surveyors, in laying out what is known as the Ackling Dyke, crossed the iron-age track-way known as the ‘Ox Drove’ ridgeway in order to avoid the heads of two combs. In doing so, they merged the line of the Roman road with that of the older track for more than a kilometre before breaking off to follow an alignment across the Ebbles River at Stratford Tony, on route to the settlement at Badbury.⁷⁷¹

At another site, a little north of this, on Pertwood Down in the Wiltshire Downs, an aerial photograph taken in 1924 (Fig. 4.16) shows how Roman surveyors, in order to

⁷⁶⁸ Jones (2011), 30-36.

⁷⁶⁹ Levaux (2003a), 330-331; Bishop (2005), 214, 218; Adams (2007), 212, 214-215; Gates-Foster (2012), 209-213; Hitchner (2012), 223-225; Kolb (2013), 111-115.

⁷⁷⁰ Malim and Hayes (2011), 56, 62, 66-72.

⁷⁷¹ Sparey-Green, *Pers. Com.* 11/08/2014.

descend the steep side of a comb along an easier route, took advantage of a terrace to effect a change of alignment in the exact manner described by John Poulter.⁷⁷² This change in alignment, as O. S. G. Crawford pointed out in 1928, caused the Roman surveyors to follow the line of the ridge, paralleling what is termed a ‘double-lynched way’.⁷⁷³ This iron-age track-way was laid down running south-west to north-east in order to access a series of fields under cultivation. The Roman surveyors were quite happy to follow this line until they wished to push their road west, at which point they broke away from, and cut through, the line of the older track in order to carry their route to the Mendips and possibly further on to the Bristol Channel.

Whether the Romans constructed this route with or without the assistance of the local land-holders, their adoption of the older road to their own needs initiated a complex range of changes in local settlement practices and travel patterns. The forcible introduction of those changes was not inconsequential, since the limited availability of military surveyors frequently meant that the completion of road construction and the reorganisation of agricultural land would be left to the local land holders, who could expect help from the Roman emperor’s personal staff only in exceptional situations.⁷⁷⁴

4.13 The Province’s Form and the *Forma Provinciae*

With the myriad of small track-ways and side roads that crossed the Empire, one might legitimately question how much information on sites such as the one at Pertwood Down filtered up to the imperial administration at Rome. However, there were two features that clearly shaped the understanding of imperial administrators at the strategic level and local land-holders alike. On the one hand, there was the zeal and ability of the surveyors to structure the local landscape while taking careful notes as members of the wider imperial community.⁷⁷⁵ On the other hand, there was the imperial administration’s need to structure space on a grand scale through the creation of provincial boundaries as much as inter-regional roads to connect and partition the territory under its control.

⁷⁷² Crawford (1928), fig. 37, pl. XXVI.

⁷⁷³ Crawford (1928), 159.

⁷⁷⁴ App. 2.7, 2.43, 2.46, 2.48; AE 1983.0944; Sic. Flac. *De Cond. Agr.* 2000.112.9-33 = 2010.2.26-32; Crawford (1928), 159-160; Kolb (2013), 113-114.

⁷⁷⁵ Talbert (2005), 96; Campbell (2005), 331-332; Chapters 1, 3 and 4 above.

As a series of inscriptions from Africa shows, Roman magistrates worked to create provincial boundaries through formal agreements and fixed topographical features, which could be measured and incorporated into a formal survey much as was done for the creation of private or municipal holdings.⁷⁷⁶

By the authority of Vespasian Caesar Augustus, Father of the Fatherland, the boundaries of the province, both new and old, were set in order, which was accomplished at the Royal Canal by Rutilius Gallicus the Consul and Priest and by Sentius Caecilianus the Praetor, Legates of Augustus with Pro Praetorian authority.⁷⁷⁷

Provincial boundaries may not have always been marked, and they may have had very little appreciable impact on the day to day lives of most people, but they still structured their interaction with the imperial administration as well as much of their understanding of the world.⁷⁷⁸ This understanding is made manifest in the text of the *Patara*, where the provincial boundaries, even though they are not described, still dictate the cities and routes included in the itinerary, a point which is demonstrated by the fact that the city of *Attaleia* is explicitly listed as the first city beyond the provincial boundaries on the road into *Pamphylia*.⁷⁷⁹ In addition to this provincial border crossing, four other named political units of *Lycia* appear on the monument to provide topographical orientation and a geographic sense of structure at a level not found in most itineraries.⁷⁸⁰ These political features include the province of *Asia*, two *conventus* or internal administrative districts of the province, *Oktapolis* and *Mnara*, and one topographical region, the *Milyas*.⁷⁸¹ It was the internal boundaries of these administrative districts as much as municipal and provincial frontiers that dictated the composition of provincial councils and tended to direct the course of inter-city competition and self-definition, the forces which gave the Empire form and life.⁷⁸²

Another set of documents demonstrating the activities of the surveyors in the active creation of a formal structure for a province on behalf of the Roman

⁷⁷⁶ App. 2.45, 3.6, 4.1, 4.3, 4.12, 4.17, 4.26, 4.54, 4.57; Sergejevski (1964), 93.

⁷⁷⁷ App. 2.47.

⁷⁷⁸ Talbert (2004), 27-30; (2005), 99-100; Ando (2008), 506-510; (2010), 31-40; Haensch (2011), 99-100, 103-105; Caballos Rufino (2011), 186, 193.

⁷⁷⁹ App. 4.26, C 8, 28; Sahin and Adak (2007), 81-84, 106-110; Salway (2007), 196-197.

⁷⁸⁰ Salway (2007), 183-190; Talbert (2007), 258-261.

⁷⁸¹ App. 4.26, B 21, 37; C 8, 21, 28; Salway (2007), 203.

⁷⁸² Burton (2002), 114-116; Ando (2010), 36-42; (2011), 31-33; (2012a), 221-223; Haensch (2011), 102, 104-105; Gordon Peral (2011), 210-212; Eich (2012), 89-92; Lavan (2013), 216, 218, 224-226.

administration, is a series of milestones set up in *Arabia* by Trajan to celebrate the incorporation of that region into the Roman Empire:

The Emperor Caesar Nerva Trajan Augustus, son of Nerva, Germanicus, Dacicus, *Pontifex Maximus*, in the 15th year of his tribunician power, hailed as Emperor for the 6th time, Consul for the 5th time, Father of the Fatherland, laid out and excavated a new road that was driven into the structure of the Province of *Arabia* (*in formam provinciae Arabiae*) from the borders of Syria all the way to the Red Sea through the (services) of Gaius Claudius Severus, Legate of Augustus with Pro Praetorian authority and designated Consul.⁷⁸³

The expression “*in formam provinciae Arabiae*” is unusual, but the context makes it clear that Trajan was referring to an intellectual conception involving the formal physical organisation of *Arabia* constituted by the provincial road-network and the surveyed borders of Syria and the shore of the Red Sea. It is equally clear that the road Trajan built was a significant feature defining the newly-created province’s internal structure. Like the road and bridge described by Balbus, the road found on the Trajanic milestones set out from an area defined by a Roman frontier and penetrated into a previously uncontrolled territory in order to redefine it in quantitative terms as Roman. In the case of *Dacia*, *Arabia* and *Lycia*, the province was defined by the *fines* or boundaries, which formed a geographic framework for the incorporated communities, which made up the province and *viae*, or roads, which linked the cities together and helped to create an administrative hierarchy anchored in the region’s topography.⁷⁸⁴ The use of measured boundaries, geographic features and roads, all quantified and recorded by the surveyors, to create a formal physical and intellectual construction for *Lycia*, *Dacia* and *Arabia* would tend to suggest that Verranius, Trajan, Balbus and those who built the road through *Arabia* all thought in terms of a common system of construction for organising the provinces of the Empire.

What is less clear is how the quantitative information gathered by surveyors underpinning and shaping this understanding was transmitted from the field to administrators and then from administrators to people in a world without modern mass-communication. There can be little question that surveyors could be organised to collect information and then file reports on it, either through the usual structure of the legions

⁷⁸³ App. 4.36, 4.37, 4.38, 4.39.

⁷⁸⁴ App. 4.37, 4.38.

as outlined above or through the freedmen and private associates forming a governor's *concilium*.⁷⁸⁵ But these social networks would not allow a governor such as Verranius to restructure and transmit a full understanding of a province based on aggregate data out to all the cities in his jurisdiction. Proof that such information was transmitted can be found in the fact that the text on the *Patara* monument was inscribed in Greek rather than Latin, indicating that Lycians as much as or more than future Roman officials were the intended audience of the text.

In addition, while the monument employs a topographic and perhaps even geographic organisation to the description of cities and routes, the text only provides a few of the Roman administrative districts and provincial frontier boundaries shaping the identity of the province. With nothing in the text to explain why some districts and political features were included while others were not, the text of the *Patara* monument would have only been meaningful to Greek-speaking members of the Empire who were already familiar with the geography and political structure of *Lycia*.⁷⁸⁶ Indeed, the amount of information that was not included on the *Patara* monument has been demonstrated in two articles published by Fatih Onur. In both articles Onur outlines some of the results from a two year field survey undertaken from 2009 to 2010, during which many of the road networks of *Lycia* were investigated and new evidence discovered. While most of the roads covered in these reports are recorded on the *Patara* monument, two sets of features discussed are not.

One set of features are the boundaries of *Patara*'s municipal territory and the *conventus* of which it was a part in the Roman period. Fatih Onur and Mehmet Alkan have recently argued that these boundaries are reflected in a series of inscriptions recorded during the 2009 field survey.⁷⁸⁷ The other set of features is an otherwise unrecorded series of roads running down to port cities such as *Antiphellos*, *Aperlai*, *Teimusa*, *Simena* and *Istlada*, which should be recorded as part of the route on the *Patara* monument running from *Phillos* to *Kyaneai*.⁷⁸⁸ The high degree of Roman administrative interest in the roads and boundaries around *Patara* and the absence of these features from the *Patara* monument serve to underscore the highly selective

⁷⁸⁵ Str. *Geog.* 2.5.14; Ptol. *Geog.* 1.2.1-3; Eich (2012), 89-92.

⁷⁸⁶ Sahin and Adak (2007), 96-98; Salway (2007), 202-203.

⁷⁸⁷ Onur and Alkan (2011), 66-71.

⁷⁸⁸ Sahin and Adak (2007), 252, 256; Onur and Oktan (2013), 96-98.

presentation of information found in the text. This selectivity suggests that there was another source document behind the *Patara* monument, which contained the full range of information needed for the administration of the province. In all likelihood, this information would have been found in the document, or documents, which embodied the *forma provinciae*. Put another way, the *forma provinciae* comprised both the intellectual conception of a province as a discrete place and the document, which contained the formal organisation of the physical landscape and its administrative infrastructure.

While the *forma provinciae*, as an administrative document, would represent a logical means for transient administrators to understand the extent of the territory for which they were responsible, its existence in day to day administrative activities is only manifest in legal cases involving the lawful jurisdiction of tax collectors and municipal officials recorded in a series of three inscriptions.⁷⁸⁹ One of these inscriptions records the verdict rendered by Manius Laberius Maximus in what seems to have been a dispute between Charagonius Philopalaestrus, public contractor for the *portorium* of the Thracian coast, and the people of *Histria*.

As has been discussed elsewhere, the people of *Histria* had long been concerned that their ancestral right to fish in the mouth of the Puce River without taxation would be violated in spite of the fact that several successive governors had reaffirmed it.⁷⁹⁰ When Charagonius Philopalaestrus arrived in the region with a *forma* describing and authorising him to collect *portorium* from the mouth of the Puce River and other places, the Histrians seem to have protested his attempts to collect from them by filing a challenge in the proconsul's court. To settle the matter, Laberius had a survey of the Histrian territory carried out. His final verdict, however, while fragmentary, clearly rested on extensive documentation covering not just the territory of *Histria*, but the geographic limits for administrative districts within his own province as well as those in the surrounding provinces:

Copy of the decree of Manius Laberius Maximus, Legate of Augustus with Pro Praetorian authority: (Issued) when the Emperor Caesar Trajan Augustus Germanicus was consul for the third time and Julius Frontinus

⁷⁸⁹ Haensch (2011), 98,100.

⁷⁹⁰ App. 4.17; Elliott (2004), 86-91.

was also consul for the third time, 8 days before the Kalends of November. It was transcribed and checked for accuracy against the records of Manius Laberius Maximus, Legate with Pro Praetorian authority. With authorisation [---] from Fabius Pompianus, which were addressed to Charagonius Philopalaestrus, public contractor for the *portorium* of the Thracian coast, so that, as requested, the *portorium* from *Halmyris* and *Puce* might be granted to him in accordance with the *forma* he has received. He shall have the right to the *portorium* due from the boundaries of the villages of the *Dimensies* all the way...⁷⁹¹

The *forma* Charagonius used to press his claim is an ambiguous document, but it seems to have included his authorisation to collect taxes and a description or diagram showing the part of the province where he was expected to work. To reach his verdict, Laberius seems to have checked the geographic information in this *forma* against the results of the survey carried out around *Histria* and the known limits of the tax districts in the province. This course of action would only be possible if there was a document, or documents, recording the full administrative structure of the province, a *forma provinciae*. The existence of such a document is suggested independently of both this *decretum* and the *Patara* by a letter from the imperial legate Flavius Sabinus to the people of *Histria* referencing the extent of the tax district and indicating that both he and the magistrates of the city understood the geographic extent of the territory under consideration.⁷⁹²

Beyond the *Patara* monument and the inscriptions from *Histria*, two Greek inscriptions from *Aphrodisias* (Figs. 4.17 and 4.18) further illuminate the character and function of the *forma provinciae* as a tool to establish administrative direction in the provinces at the imperial level, suggesting that copies of the *forma* were retained, both in the province, and at the imperial residence. Both documents are letters addressing the issues of liturgies and taxes levied against the citizens of *Aphrodisias*, an independent city like *Histria*. The first letter is a subscript written by Trajan to the city of *Smyrna* exempting Tiberius Julianus Attalus of *Aphrodisias* from having to perform liturgies in the temple there. The second one was written to *Aphrodisias* by Hadrian to affirm that the city was indeed exempt from paying provincial taxes, making the situation similar to the one faced by Laberius:

⁷⁹¹ App. 4.17.

⁷⁹² App. 4.17.

Emperor Caesar Trajan to the *Smyrnaeotes*. I do not wish anyone from the free cities to be forced into (undertaking) your liturgy, and especially no one from *Aphrodisias*, since that city has been removed from the *forma provinciae* so that it is not liable, either to the common liturgies of *Asia* or to others. I release Tiberius Julianus Attalus, a man who has the highest commendation from his own city, from (service at) the temple in *Smyrna*; and I have written about these matters to Julius Balbus, my friend and the proconsul.⁷⁹³

The Emperor Caesar Trajan Hadrian Augustus, son of the deified Trajan Parthicus, grandson of the deified Nerva, *Pontifex Maximus*, in the 3rd year of his tribunician power, greets the Magistrates, Council and citizens of the Aphrodisians.

Your freedom, autonomy and the other things which were granted to you by the Senate and the Emperors who have preceded me, I have already confirmed.

I have been petitioned through an embassy about the use of iron and the tax on nails. While this matter is controversial, since this is not the first time that the contractors have attempted to collect from you, still, I knowing the city worthy of honour and removed from the *forma provinciae*, release it from payment; and I have written to Claudius Agrippinus, my procurator to order the contractor for tax-collection in *Asia* to keep away from your city.⁷⁹⁴

The resolution to both of the cases set out in these letters is drawn from the civil law of property-ownership governing the foundation of colonies, which was touched on in previous chapters. These laws stated that land within the territory of a colony that was not allocated to a colonist and therefore retained by an original inhabitant is not subject to the liturgies and taxes of the colony but rather falls under the jurisdiction of the community from whose land the territory of the colony was taken except in some very special circumstances.⁷⁹⁵ In the case of *Aphrodisias*, both Trajan and Hadrian have applied the principle to the entire city, which they treated as being within the lands comprising the Roman imperial province, but not under the Empire's jurisdiction, by virtue of being an independent city. To make this principle binding under Roman law, the reference to the *forma* recording the lands not controlled by the *colonia*, or in this case the Empire, had to be reproduced from the Latin *forma* in a Greek administrative document with as much fidelity as possible.

⁷⁹³ Reynolds (1982), 113, doc. no. 14.

⁷⁹⁴ Reynolds (1982), 116, doc. no. 15.

⁷⁹⁵ Campbell (2000), 349, nos. 23, 55, 362; Guillaumin (2010), 91, nos. 3-6; Chapter 4 above.

The concept of the *forma provinciae* in both letters is derived from the Greek word *toupos*, which carries strong connotations of drawings, diagrams, legal constitutions, theoretical, philosophical and even physical models or blueprints, making the term very close to the Latin word *forma* in meaning and function.⁷⁹⁶ Modern commentators of these two documents have tended to translate the idea expressed here as either “*formula*” or “*schemata*”.⁷⁹⁷ Both translations capture aspects of the document under consideration. But neither really captures the legalistic principle drawn from the Latin *Ius Civilis*, which the emperors have in mind when they use the formula “removed from the *forma provinciae*” (“*exeremenes tou tupou tes eparcheias*”). This construction was drawn from the practice maintained by the surveyors, whereby all allotments of land that were returned to the original possessors at the time of a colony’s foundation, and therefore not subject to the colony’s jurisdiction, were noted down on the *forma agrimensorum* as removed or returned.⁷⁹⁸

This would tend to suggest that the emperors could, and indeed did, consult some sort of document in which the city of *Aphrodisias* was listed as physically present in the landscape of *Asia*, but juridically separated from the province. Moreover, the use of *toupos* or *forma* in this context suggests that the document, like the *forma agrimensorum* recording colonial lands, was comprised of both text and images. It also suggests that the two documents had similar functions.

Greek and Latin had a word for a diagram representing a large geographic region, “*chorographia*”, and the Roman army had “*chorographiarii*”, or soldiers responsible for producing the *chorographia* in its ranks.⁷⁹⁹ While surveyors in general and *chorographiarii* in particular seem to have had a deep interest in Hellenistic geography and geographic theory, the *chorographia* is very hard to define as a document, since the descriptions of it differ greatly from one account to another. It is even possible that the term referred to several different types of documents related only by the fact that they all showed what the creator took to be a region. Each such document would therefore

⁷⁹⁶ Liddell and Scott (1965); Reynolds (1982), 114-115.

⁷⁹⁷ Reynolds (1982), 115; Ando (2010), 35.

⁷⁹⁸ Hyg. *De Cond. Agr.* 2000.84.19-22 = 2010.2.30; Christol (2006), 88-91; Dubouloz (2012), 88-91, 96, 100.

⁷⁹⁹ App. 3.19, 3.23; Sherk (1974), 550, nos. 50-51.

reflect not only the specific circumstances of its creation, but the individual stylistic peculiarities of its creator as well.

Descriptions provided by both Strabo and Vitruvius, however make it fairly clear that at least some *chorographia* depicted rivers, mountains, cities and coastlines at the regional level with enough detail that administrators, like Verraninus or Hadrian could identify individual *toponoi* for the purposes of making decisions, such as those expressed in the documents quoted above.⁸⁰⁰ At the same time, the identification of the *forma provinciae* with a *chorographia* should be taken with care, since Ptolemy states that the production of a *chorographia* required not mathematical knowledge, but rather the skills employed in landscape painting.⁸⁰¹ Given his remarks, the *chorographia* should not be seen as involving centuriation in any way, nor should they be seen as maps in the modern sense. By the same token, Ptolemy's observations should not be seen as eliminating the possible value of the *chorographia* as an administrative document or as a possible structural identity for the *forma provinciae*.

Ptolemy, like many other authors from antiquity, should not be taken at his word. This is particularly true, since Ptolemy, like Strabo before him, makes it clear that much of his geographic knowledge is derived from the quantitative investigation of the landscape and therefore from the activities of surveyors.⁸⁰² Ptolemy's and Strabo's common dependence on survey data suggest that there was a complicated relationship between surveyors and those who chose to practice geography, which has yet to be fully explored. As part of that complex relationship, Ptolemy may have used the concept of landscape painting as an analogy or as part of a rhetorical metaphor, in which the description of a *chorographia* as a landscape painting served as part of a reductive strategy to enhance Ptolemy's own scholarly achievements as a mathematical geographer by presenting the accomplishments of the *chorographiarii* as little more than ornamental art. As was noted in Chapter Two above, such reductive strategies, while not common in the *Corpus Agrimensorum*, do feature in much of the technical

⁸⁰⁰ Compare: Vit. *De Arch.* 8.2.6; Str. *Geog.* 2.5.2; 2.5.10; 2.5.17; Ptol. *Geog.* 1.1.1-5.

⁸⁰¹ Ptol. *Geog.* 1.1.

⁸⁰² Compare: Str. *Geog.* 2.5.2; Ptol. *Geog.* 1.2; 1.19; 2.1; Agen. Urb. *De Cond. Agr.* 2000.18.13-33; Hyg. *Const. Lim.* 2005.7.1-8.9; Hyg. *De Cond. Agr.* 2010.2.48; Hyg. *De Contr. Agr.* 2010.3.2; 2010.3.6.

literature, and are particularly common in Ptolemy's contemporary Galen.⁸⁰³ While Ptolemy cannot be said to display the same stylistic tendencies as Galen, he does make a point of criticising the work of previous geographers such as Marinus of Tyre as part of a conscious strategy intended to enhance his credibility.⁸⁰⁴ While a wider literary study of Ptolemy's introduction is needed to establish the exact rhetorical function of the passages discussing the *chorographia*, such a study is outside the scope of this project and will be left for a later time.

Even so, whatever the truth behind Ptolemy's use of the *chorographia* may prove to be, two points seem to be clear. First, the *chorographia*, whatever it may have looked like, contained graphics, which, like the *forma agrimensorum* or the pictorial diagrams found in medical and mechanical manuals, served as the centre point of discourse.⁸⁰⁵ Secondly, the *chorographia*, like the *forma agrimensorum*, represented a genre of document with its own compositional discourse, establishing what a *chorographiarius* might, or might not, be allowed to include when creating one. As was noted in previous chapters, the full extent and nature of this discourse remain uncharted. Within the known range of elements in that discourse, however, there is plenty of room for identifying the *toupos* mentioned by Trajan and Hadrian as a *chorographia* of sorts.

Apart from the possible examples found in the 'Madaba Map' and the diagram found on the highly controversial Artemidorus Papyrus, there are no surviving depictions of regional chorography to provide details of the *toupos* or *chorographia*'s appearance.⁸⁰⁶ Even so, the available evidence indicate that the graphic or diagram at the centre of the document possessed a label or diagrammatic attribute, such as a letter, for each feature of interest, and a commentary to provide discussion and/or, guidance for the document's interpretation.⁸⁰⁷ Since the *forma agrimensorum* was devoted to displaying the centuriated land of a community and the *forma provinciae* was intended to reflect the communities and administrative districts of a province without any reference to centuriation, there would have been a considerable difference in form,

⁸⁰³ Gal. *Anat. admin.* 7.13; *Meth. med.* 5.7; 5.10; 5.15; 6.2-3; 6.5; 8.3; 8.7; 10.3; 13.14-16; 13.21; 14.8-9; *Cur. Ven. Sect.* 17; *Praecog.* 2-5.

⁸⁰⁴ Ptol. *Geog.* 1.7-8.

⁸⁰⁵ Netz (2013), 239-241; Bogen (2013), 280, 284-288; Chapters 3 and 4.

⁸⁰⁶ Brodersen (2001), 11-14; Talbert (2009); (2012c).

⁸⁰⁷ Compare: App. 3.23; Aristot. *Metaph.* 1078a20; *Meteor.* 363a21-35; Str. *Geog.* 2.1.10; 2.5.10; Vit. *De Arch.* 8.2.6; Plin. *HN.* 5.109; 3.1426b; 3.1442b; 3.1443b.

content and composition between these two types of document. However, the functional nature of the two documents was similar.

As discussed elsewhere, the *forma agrimensorum* created a monumental depiction of a community's territory, which mediated between the abstract concept of the community and its concrete reality through a graphic representation that allowed for the regulation of social relationships and the orderly regulation of property.⁸⁰⁸ The *forma provinciae* mediated the abstract concept of the province and its concrete realities in a similar manner, by presenting the relationships between communities, the administrative districts and the provincial capital in a single monumental display.

Such mediation and the comprehension it could foster was just as crucial as having itineraries and tax documents in a political system where provincial administrators did not remain in one place long, changed postings frequently, and needed to quickly comprehend the extent and nature of their province. The text of the letters from Trajan and Hadrian show both the value of such understanding for an administrator far removed from the site of a given situation and the extent to which the information from the *forma provinciae* could be used to structure social relationships in order to resolve existing problems.

In addition to serving as an aid to the administration of a province, there is circumstantial evidence to show that the *forma provinciae* also served a propagandistic function. Within the text of the bronze tablet found in Lyons recording the speech Claudius delivered before the senate in 48 AD, there are no less than three passages indicating that the emperor used detailed depictions of the provinces as props in his oration. First, Claudius uses the demonstrative interjection "*ecce*" meaning to behold to reference the colony of *Viennensium* or Vienna.⁸⁰⁹ "*Ecce*" by its very nature carries the force of demonstration and gesture, indicating that Claudius was pointing to something within the chamber, which could be used to reference the city in a visual manner.

In addition to this demonstrative interjection, both an unnamed senator and Claudius make direct reference to the boundaries of the Gallic provinces. Indeed, the

⁸⁰⁸ Gorges (1993), 13-16; Christol (2006), 86; Dubouloz (2012), 96; Roby (2014), 27-29.

⁸⁰⁹ App. 4.65, line 51.

text even indicates that Claudius physically pointed to regions depicted in a document, or documents, which showed the relationship between *Gallia Narbonensis* and *Gallia Comata*:

“It is time, Tiberius Caesar Germanicus, that you show the Conscript Fathers where it is that your speech is headed. You have already come to the furthest reaches of *Gallia Narbonensis*. ... And if you should agree about this (point), what more could you wish than that I draw your attention (to the issue) by pointing to this section of land on the other side of the boundaries to the province of *Narbonensis* which already sends you senators because it is not displeasing to have men from *Lugdunum* in our ranks. Indeed, Conscript Fathers, I am hesitant to depart the boundaries of the provinces which are customary and familiar to you, but the case for *Gallia Comata* must now be pressed unreservedly.”⁸¹⁰

In addition to using what is unmistakably visual language in this passage, Claudius, like Trajan in the text on the milestone discussed above, invokes the formal language of surveying. When Claudius states that he is pointing out (“*demonstrare*”), the land (“*solus*”), which is beyond the boundaries (“*fines*”), he is drawing on the vocabulary and phrasing used by the surveyors in the formal *demonstratio* that established a colony or resolved a boundary dispute. Since Claudius was speaking before the Senate in Rome and not on the border between *Gallia Narbonensis* and *Gallia Comata*, such a *demonstratio* would have required a graphic representation of the land in question or some such substitute representation of the land to be effective. Unfortunately, there is nothing in the speech to indicate whether Claudius was using painted wooden panels showing the territory of a single province or a large scale diagram or map of the western provinces similar to the map of the world mentioned by Eumenius.⁸¹¹ It would seem far more likely that Claudius was referencing the *formae provinciarum* for the three *Galliae* and the two *Germaniae* given the evidence provided by the letters of Trajan and Hadrian, as well as the *forma* of *Ethiopia* mentioned by Pliny the Elder:

A *forma* of *Ethiopia* was examined when a report was made to Nero that showed nothing for 986 miles past the border of the Empire at Cyrene all the way to Merin where a rare grove of palm trees grew.⁸¹²

⁸¹⁰ App. 4.65, lines 62-74.

⁸¹¹ Pan. Lat. 9(4).20.2-21.3; Talbert (2012b), 170-172.

⁸¹² Plin. Nat. 12.19.

The *forma* mentioned here was probably nothing like the *forma provinciae*, since it is very unlikely that the surveyors in the exploratory expedition sent out by Nero were able to establish the borders of *Ethiopia*. However, the passage, when considered alongside the speech of Claudius quoted above, shows that pictorial representations of space were used to inform and persuade, creating social and political relationships that influenced the course of events in the Roman world. Since the political and administrative processes in the provinces tended to reflect those at Rome, it would be logical for provincial administrators to employ the *forma provinciae* as a persuasive tool to foster the sense of provincial identity, which scholars sometimes feel they find in the epigraphic record.⁸¹³

But such an interpretation must remain a conjecture at this stage, since there is no direct evidence, other than the *Patara* monument, and perhaps, the Artemidorus Papyrus, to support it. Even if the Roman administration used the *forma provinciae* to help organise provincial *conventus*, the letters of Trajan and Hadrian show that while the municipalities were expected to know about the *forma provinciae*, they were not expected to know its contents. In light of this, tactical surveying during the Roman's first entry into a region and in the following years was principally intended to facilitate Roman control and inform the Roman central administration about the territory under its control.

⁸¹³ Eck (2004), 9-12; (2009), 78-79, 81-83, 93-95; Haensch (2011), 99, 101-102; Caballos Rufino (2011), 188-191, 193; Ando (2011a), 31, 34, 40-41; (2012a), 223; (2012b), 114; Gordon Peral (2011), 210-212, 218-219; Eich (2012), 87-92.

Chapter 5: Shaping the Roman Empire: Conclusions

5.1 Conquest and Control: Surveying and the Foundation of a Province

From the time of Augustus onwards, the Roman *agrimensores* or surveyors provided a valuable linchpin between those who administered the Empire and the territories they controlled. As the discussion in Chapter Four shows, the surveyors' activities as part of the Roman legions provided the Roman army with an invaluable tactical advantage out in the field. When the Roman legions went to war, surveyors, such as the *mentor* Balbus, aligned and marked out lines of advance for the supply columns to follow and along which captured people and materials could be sent back to Roman territory. When rivers proved to be too deep to ford and the local population burned the boats and bridges, surveyors calculated the width and depth of rivers. With the help of architects and carpenters, they constructed bridges for the mule carts carrying supplies and for the field artillery.

These roads, which were often created out of local paths and tracks, along with the newly created bridges, formed fresh structures for occupation and control. As such they were the first lines in a new discourse about the structural identity of the landscape itself and the culture of those who inhabited the places which the Roman army dominated and redefined through violence and the application of mathematics. The sudden transcendence of natural barriers and the transformation of familiar places through the introduction of bridges and the surveyor's long-distance alignments connecting *castra* and *urbes* constituted an act of shock, awe and violation. Reactions to this reconfiguration of space and place would have varied from people to people, depending on prior exposure to Roman culture and local social conditions, with some coming to terms, some fighting and others hunkering down at home behind fortifications.

Those who chose to seek shelter from the Roman storm within fortified strongholds had to reckon with the surveyors directly since the *agrimensores* regarded man-

made fortifications as a challenge which, like the natural barriers of mountains and streams, they could overcome with their craft. Yet, in the course of a siege, surveyors were technicians and advisors, who had to remain deferential to the senatorial commander, even as they applied their technical skills to reconstruct the landscape around the besieged community. As was discussed in the chapter, the siege progression was its own form of aggressive discourse, with rules and stages. The surveyor's part in the discourse was first to construct camps, then connect them with trenches and towers to create a sort of no-man's land out of the civic population's most familiar spaces. If the psychological shock and threat embodied in such a transformation did not compel surrender, the surveyor would be called upon to engineer assault ramps, mines and other methods for breaching the defences during the heavy assault by the legionaries. The total destruction the Romans wrought upon any community they stormed and the scars a siege left in the landscape sent a powerful message demanding compliance from the people living in the surrounding region.

While the activities of the surveyors were crucial to the Roman legions' ability to secure tactical victories in campaigns such as the Dacian Wars under Trajan or Vespasian's expedition to suppress the Jewish uprising, they were only the prelude to the larger task facing the surveyors should the emperor or his representatives choose to formally incorporate a region into the Empire as a province. As noted in the introduction, it was the administrative needs of the senate in the later Republic and the age of Augustus which necessitated the identification of a province as not just a realm of responsibility, but as a geographic region where authority was exercised. In order for such an exercise of power to take place, it was crucial for Roman administrators to know exactly what it was that they controlled.

As the *Patara* monument and other documents considered in Chapter Four show, it was the surveyors and the soldiers under their direction, who not only measured the roads and other pathways in a region, but collected the cities of a region into groupings and measured the distance between topographical points to form a provincial frontier as well. To judge from the *Patara* monument, cities were clustered together based on topography and their relationship on a given road network. In the case of *Lycia*, the surveyors seem to have grouped the cities into six separate networks, all of which radiated out from the city of *Patrai*. Interestingly enough, when organising the

networks on the *Patara* monument, the surveyors did not create an itinerary which could be used to plan travel through the province. Rather, the groupings structure political and topographical relationships, which could be used for understanding the socio-political or topographical organisation of a province, but little else. Evidence gleaned from the *Tabula Peutingeriana* for the modern region of Romania suggests that similar documents were composed for Dacia and, in all probability, other provinces as well.

In the case of the monument from *Patara*, however, the text shows that the information included in the document organising the province was not simply intended for the Roman administration's consumption. The text on the *Patara* monument was drafted in Greek, but the distances for the individual routes listed were converted from Roman miles to Greek *stadia*, something which would have only been necessary if the information was intended for the use by the people of *Lycia*. This factor could mean that the people of *Patara* took the information from a Roman document to honour the emperor and his legate Verranius, or that Verranius created the monument to simultaneously honour the people of *Patara*, as the newly established capital of the province, and the emperor, as the divine ruler of the *oikomene*. A third possibility – not discussed in the literature – is that the monument was a joint project between Verranius and the citizenry of *Patara* to express the solidarity of the people of *Lycia* and the Roman administration under the divine rule of Claudius through the direct articulation of the province's new political structure.

All three of the reasons for the *Patara* monument just presented reflect the same political reality in which the administration transformed quantitative and qualitative information, collected by the surveyors through the direct autopsy of the landscape into a conceptual framework, which defined the province of *Lycia*. Since the information about place names on the monument, if not the measurements themselves, had to be drawn from interaction with the Lycian population, and the information was presented in a form the Lycians could utilise, the *Patara* monument, and whatever documents were behind it, represent the first stages of a provincial discourse formulated by surveying. The evidence taken from the Lyon tablet recording the speech of Claudius to the Senate, as well as the letters of Trajan and Hadrian preserved on an archive wall at

Aphrodisias, show that other forms of political interaction derived from the documents organising the province continued to take place long after a province was constituted.

Trajan addressed a complaint from a Roman citizen from *Aphrodisias*, who insisted he was being compelled to perform a liturgy, which he was not obligated to perform by the people of *Smyrna*. Meanwhile, Hadrian addressed a complaint from the people of *Aphrodisias* concerning a tax on nails, which they did not believe they were obligated to pay. In both cases, the emperor ruled in favour of the people from *Aphrodisias* using the information from a document which has been translated as the *forma provinciae*. Claudius likewise seems to have pointed to some sort of document, which depicted or included information about the boundaries and cities of the Gallic and Germanic provinces. Unfortunately, in the case of the Lyon tablet, interpreting the nature of the document is much more difficult than in the case of the Trajanic and Hadrianic letters. In the letters, the document clearly contained information about the cities located within the *finēs* or borders of Asia, their physical and sociological relationship to one another, and their political status within the Empire. Other inscriptions discussed within the chapter show that a *forma provinciae* existed and that it represented an intellectual formation of a province's physical and political structure based on roads and topographically constituted boundaries, two features which were defined by the surveyors.

5.2 Colonists, Administrators and the Roman Surveyors

While the creation of military assault roads undoubtedly disrupted agricultural patterns for some indigenous land-holders and the establishment of Roman administrative boundaries altered the political landscape by requiring local civic leaders to recognise a powerful new player on the stage of public affairs, the surveyors greatest impact on others came after the province was formulated in the imagination of the emperor and his representatives out in the field. As Chapters One and Three show, the direct discourse involved in the resolution of boundary disputes, the assessment of taxes and the creation of Roman colonies regulated the influence and impact of surveyors on the peoples of the Roman world. Though these three activities were closely related, they were distinctly different in their impact and the surveyors approached them differently. They

tailored their approach to these tasks both in terms of the objectives which they needed to achieve and to fit the context within which they operated.

The distinctions are perhaps most apparent in the foundation of colonies, the activity most commonly associated with the Roman surveying both in antiquity and modern times. In creating a colony, the surveyors usually cut off land from an existing community to shape both the external structure and internal organisation of a brand new community. Though the formation of a colony was governed by an ideal theoretical paradigm found in the *Corpus Agrimensorum*, the surveyors tailored the pattern for laying out both *pertica* and *urbs* to meet the unique topographical and political conditions governing the community's foundation.

In the ideal paradigm of the *colonia* considered in Chapter Two, the *pertica* was supposed to extend in all four directions from a central point or *locus gromae* at the centre of the city, with the urban fabric separated from the *fundi* and their land by the walls and *pomerium*. But such an organisation was strictly an ideal that was hardly ever realised. Even so, the surveyors laid out the *pertica* at most colonies using a universal mathematical principle. This always involved creating a grid of intersecting *limites* forming rectangles or squares of a set size. The size varied from place to place, but was always adjusted in multiples of 120 Roman feet. Theoretically, the surveyors wanted all of the land assigned to the *pertica* to be adjacent to the colony's urban core even when it was not present on all four sides. In practice, however, the land need not even physically be part of the urban fabric of the new community. There were plenty of cases where the *pertica* was at some distance or where the land assigned to colonists was divided between a *pertica* and a semi-autonomous *praefectura* as happened at *Emerita* in Spain.

Each colony received a body of laws that imitated those at Rome, but the details of every colonial charter were unique to the foundation of the new city. This meant that regulations governing land-distribution and property-ownership varied from one colony to another. Colonial founders tended to assign land to colonists in the *pertica* and *praefectura* either by lot or based on rank and service in the legions. Likewise, the colonial founder could, at his sole discretion, grant individual colonists tax-exemption or the right to possess more land than was normally specified by the colonial charter.

Most importantly, the founder could return land to prior possessors, when he deemed them worthy. Though this could mitigate the impact of colonial deductions on the population of a community whose land was seized by the Roman authorities, it was not a means of integrating the indigenous population of a region into Roman society. Rather, the power to return land was a means for the colonial founder to reward individual local land-holders, who supported the Romans, or grant benefactions to gain good-will amongst influential members of the indigenous population. In either case, the prior possessor was not usually a citizen of the colony and did not pay taxes or perform liturgies there, unless the colonial founder specifically stipulated that they did. In most cases, the prior possessors retained citizenship in their original community with whatever burdens that might entail. In most cases, the colonial deduction forced changes in land-ownership and agricultural practice on a community that the Romans had already saddled with a heavy burden of taxes and liturgies.

The system of legal differentiation instituted by the founder's ability to grant privileges created the hierarchical relationships, as well as the bonds between *patroni* and *clients*, which were so crucial to Roman social power structure. The surveyors themselves were not directly responsible for assigning the plots at a colony or with fixing the political privileges, which instituted the asymmetrical power relationships between Roman and non-Roman within the new community. However, they did need to understand and know about the juridical taxonomy governing their creation, since they were both responsible for drafting the *forma* with its abbreviated notations on land-holding as well as the *commentaria* explaining its contents, and for regulating disputes between land-holders regardless of citizenship or social status.

The *forma* was drafted to be a clear decisive guide to the ownership and transfer of *ager divisus et adsignatus* attached to a colony, but as passages from the *Corpus Agrimensorum* discussed in Chapter Two show, land-holders did not always abide by the terms of their assignments. When land-holders in a *colonia* made their own arrangements long after the community was created, it could cause problems in resolving disputes. Even when land-holders observed property boundaries for their allotments, buying and selling in accordance with the *forma*, problems could arise from incomplete documentation generated by the Roman administration itself. As discussed in Chapter Two, surveyors such as Sicculus Flaccus noted that this was a particular

problem for assignments made by Caesar and Octavian, where the original possessors were killed in war and the land reassigned without proper documentation, making it hard to trace the history of ownership. For this reason, surveyors insisted that it was essential to study any documentation available on the history of land-holding and all systems of boundary demarcation with great care.

Since colonies such as *Bracara Augusta* in Spain could alter the flow of trade and restructure the cultural discourse about power in a region, it was crucial for civic and imperial magistrates to properly interpret and observe the *forma* in order to regulate land-tenure and taxation not just within colonies, but between the colonies and the surrounding communities as well. This was hard to do when a dispute involved *ager relictus*, *ager extraclusus* or *subseciva* at the edge of a colony's outer boundary, where territorial jurisdiction could quickly become a problem since the ownership of such land was always open to question.

Plots of land designated as *subseciva* along the perimeter of a colony were particularly hard to regulate. In theory, all *subseciva* were supposed to be returned to the people from whom the land for a colony was taken, however, it was left to the founder to decide about such matters and the land could be allocated to the colony as unassigned pasture or woodland. When the land went unused for long periods, the situation could lead to protracted legal proceedings, since the original owners or opportunistic people from neighbouring communities could attempt to gain possession by occupying the land. By custom, if not under Roman law, anyone who occupied a section of land for a sufficient period of time could claim it as *ager arcifinius* or unsurveyed and unallocated land, held by the rightful use of force.

When people outside the colony attempted to exercise these squatter's rights on unallocated land, however, it simultaneously violated territorial boundaries and initiated a conflict with the imperial administration since the emperor held rights of jurisdiction over *subseciva*. As the case of the *Patulcenses* and *Galillenses* on *Sardinia* shows, Roman colonies could force non-Roman populations in the provinces to adapt to Roman law and administrative practices as the only secure means of asserting rights of ownership over land which may have once belong to them. Mastering Roman law did not automatically mean that the *Galillenses* could successfully contest the claims of the

Patulcenses, but they were anything but complacent or helpless in the face of Roman imperialism, going so far as to send representatives to Rome with the intention of examining the private archives of the emperor. At the same time, the case illustrates the powerful impact the *forma* had on the Roman imagination and the ways in which imperial magistrates and colonists alike constructed space as place. The *Patulcenses* conceptualised their communal sense of self-identity through *consensus* derived from the inscribed historical iconography on the *forma*. Evidently, they were totally unwilling to relinquish control over land depicted as being within their ancestral borders, even when it had gone unused for a prolonged period. This strong sense of identity derived from a past enshrined on the *forma*, as well as the difficulties in interpreting both the iconography and historiographical formation of the document, meant that magistrates and claimants alike would have found it helpful to consult surveyors in an interstate dispute.

5.3 Magistrates, Surveyors and the Populations of the Provinces

Though colonies undoubtedly had a dramatic impact on the provincial landscape and the ways in which the provincial populations interacted with both Roman citizens and magistrates, emperors, with the exception of Augustus, rarely added communities to this most exalted category of city. Consequently, few surveyors ever had the opportunity to actually lay out a colonial *pertica*. This meant that the direct impact of surveyors on provincial culture through the formation of a colony – no matter its significance in their literature – was somewhat circumscribed. For most surveyors, the day to day maintenance and regulation of boundaries for the resolution of disputes was the most significant subject of concern and the main point of contact with both the indigenous populations of a region and the Roman administrators overseeing them.

As the discussion in Chapter One shows, a provincial governor was expected to give an advice on any dispute between two communities brought before him, but he was not obligated to use a surveyor to establish the circumstances of a case. The choice to employ a surveyor was usually dictated by the conditions on the ground and as discussed in chapter Three, the legal taxonomy of a dispute. To help with such decisions, the surveyors maintained at least an unofficial taxonomy for legal cases that

they could employ to assess whether or not a dispute fell within their sphere of competence. The details for this informal system of classification differ from one author to another within the *Corpus Agrimensorum*, but, broadly speaking, the surveyors were interested in cases involving: the deposition and erosion of land by rivers, boundaries or boundary markers, site, area, the law relating to *subseciva*, and territorial jurisdiction. If a provincial magistrate found that the litigation he was asked to adjudicate involved any of these issues, he would call a surveyor in for advice, as Augurinus did in resolving the dispute between *Hypata* and *Lamia*. In that situation, as with so many, the provincial governor overheard the case as the representative of the emperor and at least in principle acted on advice and orders from the central administration.

As the documents from *Azania* show, however, the emperor in many instances simply rubber-stamped the governor's course of action, unless there was a reason to override it. The governor was the man on the spot and the central administration always expected the man on the spot to have a much better grasp of a situation than did the central administration, which was sometime separated by thousands of square kilometres. Thus, in most situations the governor had to use his best judgement and his best source of support in reaching a decision. This support would have come from a surveyor who could interact with the local population, gaining a first-hand appreciation of the situation on the ground while demonstrating that the imperial administration was taking an interest in civic affairs.

In most instances the emperor expected his governors to find a surveyor for themselves out in the province where they were stationed. To do this, a magistrate could circulate to see if any of his *concilia* had one amongst his clients or household who could be hired for the job. He could also see if the procurator had access to any through the imperial estates, though there is no evidence to show that any of the imperial freedmen or slaves, who worked as surveyors were ever detached to support the provincial administration. Rather, the emperor, like so many wealthy senators, retained such individuals for his own personal use, which included direct intervention in disputes where the litigants enjoyed imperial patronage. For the governor, as the emperor's representative in a province, however, the quickest way of locating a surveyor was to apply to the legions, since it became increasingly true in the period after Augustus that each legion had at least one surveyor on staff.

Since the majority of the provinces did not have a standing legion stationed within their borders, a governor would often have to ask the magistrates of the nearest province with a military garrison for the loan of a legionary surveyor to resolve a particular situation. Such a request frequently invoked the complexities of patronage, and was therefore not always a practical course of action for political or logistical reasons. Therefore, a magistrate would have been reduced to locating a surveyor in the same way as everyone else. This entailed finding a *collegium mensorum* and negotiating a contract for the services of one of its members on competitive bases. Only when these options were exhausted would an emperor such as Vespasian or Trajan send surveyors to support their magistrates.

Regardless of the surveyor's social status or origins, the diplomatic and juridical procedure for resolving an interstate dispute such as that between *Hypata* and *Lamia* was substantially the same as that used in resolving a dispute between two land-holders in a *colonia*, with one important difference; a *forma* might not be available for *civitates* out in the provinces. Even so, the surveyor went to the site of the dispute, established the local system used for marking boundaries and authenticating property-ownership in both communities and examined the evidence from physical features in the landscape, witnesses and documents held in both communities. Only if the case involved a *colonia*, imperial taxes, there was an imperial estate near at hand, or the emperor had personal investments in one or more of the communities would a surveyor need to consult the provincial or imperial archives at Rome.

At the end of an investigation, the surveyor would assemble the parties concerned and make his *renuntiatio* or verbal report, which was probably read from a *tabula* to give it authentication and weight. The *renuntiatio* would also entail a *demonstratio* or pointing out of the features of the landscape, upon which the surveyor's decision was based. Following the surveyor's *renuntiatio*, the governor, like any other *iudex*, would appoint a date for rendering judgement. On that day, as the documents from *Hypata*, Delphi and several other sites show, the governor or his clerk would read out his official verdict or *decretum* and copies would be posted in both communities to make it binding. Refusing to respect an imperial *decretum* would lead to further litigation, which could take years to resolve, as happened in the case of Koroneia considered in Chapter Three. If any party in the dispute resorted to the use of violence

to ask for their claims before or after litigation, the Roman response was usually swift and terrible. The Roman central administration sent men from the legions or auxiliary units to indiscriminately put down what the Romans considered to be an insurrection.

At this point it is essential to restate that a governor heard cases which provincials brought to his attention. As is amply demonstrated in both Chapters One and Three, it was the responsibility of individuals and communities out in the provinces to seek out the governor and bring disputes between communities to the attention of the Roman administration. Two communities who disagreed about their boundaries or the ownership of a piece of property were not obligated to take the matter before the provincial authorities. They could opt for private third party arbitration from another community in the region or theoretically even from a private person, who was trusted by all the communities involved. While the evidence for this practice is scarce, surviving inscriptions indicate that the procedure was very similar to that used by the Roman provincial administration, suggesting that it was most common amongst the eastern cities where the practice seems to have developed out of the process for interstate dispute resolution and diplomacy.

Having said that, the *Tabula Contrebiensis* suggests that other systems of dispute resolution may have existed in the African and Western provinces, however, no proceedings etched into wooden documents or carved into stone monuments for posterity have not survived. Surveyors may well have been involved in such proceedings using the same or similar methods to those described in the documents from *Hypata*, *Histonium* and *Herculanium* discussed in Chapters One and Three. This raises the question of just how and why surveyors appear within provincial communities.

5.4 Surveyors, *Civitates* and the Roman Empire

As the funerary *cippus* of Quintus Julius Rufus discussed at the start of Chapter Three shows, surveyors were employed by *civitates* out in the provinces. Unfortunately, the monument of Rufus does not state the reason for his presence amongst the *Siccaeniae*. Circumstantial evidence from other inscriptions discussed in this chapter and in Chapter

One provides some different options though. One possibility may have been that the *Siccaeniae* hired Rufus to help resolve a dispute with one or more of their neighbours. The presence of Rufus in such a dispute would show that the *Siccaeniae* sought to have the dispute adjudicated either by the provincial governor or through third party arbitration, flagging the *civitas*' adoption of Roman juridical principles irrespective of their relationship with Rome.

Another possibility is that the *Siccaeniae* hired Rufus to reorganise the way in which land-tenure was organised within the *civitas* to improve relations with the Roman tax-farmers. As several passages from the *Corpus Agrimensorum* discussed in Chapters One and Two and the inscriptions from *Histria* discussed in Chapters Three and Four show, *civitates* tended to structure their territory using an elliptical or circular perimeter. Frontinus, in a passage discussed at the end of Chapter Two, makes it clear that the Romans accepted and recorded such boundaries when they existed. Moreover, he also states that the Roman administration maintained a similar policy about the internal organisation of *civitates*. At the same time, the documents examined in Chapters Three and Four show that the relationship between *civitates* and the Roman tax-farmers involving territorial delimitations and property-ownership could be contentious, particularly when there was a colonial *praefectura* or the settlement of individual Roman citizens within the territory of a *civitas*. To avoid problems, the Roman administration sometimes divided provincial land subject to tax. This allowed the central administration to forcibly regulate land occupied by soldiers and to help stabilise regional agriculture for taxation following a change in a community's legal status or at the end of an armed conflict.

There were also instances in which surveyors assessing and recording the land of a *civitas* would provide notations on the *forma* to show that the land had been divided and allocated for tax purposes even when they did not measure out any *limites*. This allowed the Romans to regulate and tax the populations of the Empire in accordance with Roman practice without actually disrupting local patterns of land-holding. Even so, the use of such hypothetical lines of demarcation represented an invasive aspect of surveying that determined a community's relationship with the Roman administration predominantly along Roman lines. To avoid such an experience, it is quite likely that

many communities unilaterally chose to reorganise their patterns of land-holding to improve their relationship with the Roman tax-farmers.

Yet another possibility worthy of consideration is that *civitates* such as the *Siccanae* and *Cantiaci* carried out the reorganisation of their own lands to better accommodate and negotiate their position within the competitive hierarchy of communities that made up the Roman Empire. Such a suggestion is supported by the wooden administrative document from London discussed early on in Chapter Three. It is also supported by the activities of the *Siluienses*, who were apparently attempting to build an aqueduct to bring water across the land of the *Sosinestani*, using a course formed with geometric construction and marked with surveyors' stakes some sixty years before the battle of *Actium*.

More importantly still, at the same time the *Sosinestani* used geometric surveying to build an aqueduct; they also developed complicated Roman-style arguments to justify their conduct in a dispute with other *civitates* in the region conducted before the *decuriones* of *Contrebia*. This illustrates that *civitates* in southern Spain, such as the *Sosinestani* and the *Siccaeniae* were willing to not just employ surveyors like Rufus to restructure land-holding and agricultural facilities in order to improve agriculture and meet the demands of Roman taxation, but they were also willing to adapt Roman law to gain an advantage over other communities. This willingness to use foreign methods to adapt the landscape, regulate its use and win disputes with other communities reflects a world in which competition for agricultural or pasture land and water was fierce, if not actually violent. Indeed, documents from *Koroneia* show that competition for good pasture land became so fierce by the reign of Antoninus Pius that some communities were resorting to armed conflict, even when the emperor himself intervened directly in interstate disputes. It is therefore perhaps not surprising that even pastoralists, such as the *Rodopeis* of Thrace, had Roman surveyors delineate the boundaries of their pastures to ensure that they would not lose it to those who asked for squatter's rights on *ager arcifinius*.

Finally, there is the possibility that the *Siccaeniae* hired Rufus to help regulate land disputes within the *civitates*. Of all the possibilities available, this is the least secure and perhaps the least likely. While *municipia* in Italy can be shown to have

retained surveyors as part of the civic administration, those surveyors were usually slaves or freedmen, as was discussed in Chapters One and Three. Even if Roman citizens undertook such work on long-term contract, there is very little evidence for it outside Italy before the mid-third century AD.

Apart from the limited evidence for the civic retention of surveyors for the long-term regulation of internal land-tenure, there is the positive evidence of the boundary disputes between individuals within a single community. While this evidence reflects the bias of the epigraphic habit, nearly every text documenting the role of surveyors in a dispute between two or more land-holders within a single community, involved at least one person who was not from the community where the dispute took place. The one exception to this trend is the wooden tablet from *Herculaneum* discussed in Chapters Two and Three. This suggests that most communities outside Italy continued to prefer to resolve disputes using more traditional mechanisms of dispute resolution, which did not involve surveyors from outside the community. It also suggests a certain diplomatic air to the surveyors. Land-holders, who could not access local systems of dispute resolution as outsiders, would have been more willing to defer to the impartiality of the Roman surveyors and imperial arbitration.

5.5 Surveyors and the Shape of their Craft

Whether surveyors used the Roman foot to assess land organised into *arapennia* in Britain or cubits to assess land divided into *plethora* in *Asia Minor*, the principles of dispute resolution they employed across the Empire were the same. Their approach depended upon a conceptual system of evidentiary proofs and philosophical assumptions peculiar to Hellenistic and Roman culture. Within that intellectual framework, one could establish a claim of ownership on land based on an argument derived from the fact that: one had inherited the land from their ancestors, or they bought it for money, or they have laid claim to it by force of arms, or they received it from the emperor as a benefaction.

With the exception of the third possibility, each of these reasons for ownership could be demonstrated by witnesses, documents and monumental markers introduced

into the landscape to structure its identity and affix title to it. Moreover, the Romans and the surveyors, who worked within their juridical and cultural influence, believed that ownership had to be fixed at a specific moment in time. This is what entailed the attachment of a name to a place, so that the first recognised owner could be identified and any change in ownership traced through time. This took the concept beyond the simple occupation of a place and its retention by force. Force was always an option and – some might say – the fundamental basis for ownership, but for the Romans law and the taxonomic categories of privilege created through nomenclature and the public recognition of names was far superior.

To enter into this concept of ownership, the surveyors and all those who accepted their work recognised categories of names that constructed a hierarchy of control based on the validation, which could be obtained from physical features. The system of boundary-marking used on trees discussed in Chapter Two is an excellent example. A weak basis for a claim could be made by cutting down all the trees along a boundary except for one specific type, but a better claim could be made if the trees left standing were marked in some way. A better claim still was if the trees were specifically planted in a row. But the best visual proof found in trees was when they were planted in a row and marked. There were many other ways of proving a line of demarcation: ditches, rivers, roads and stones grouped or shaped to be distinctive features in the landscape.

Whatever the system chosen might be, verbal witnesses who could testify to the nature of the marks or trees were good, but written documents which could be validated as testimony from the time when the property was established were better. Written texts, particularly those inscribed into metal or stone had a lasting quality that allowed people to communicate with those who were absent in time or space.

Equally important was the ontological framework within which the surveyors structured boundaries and defined a section of the landscape as a place. Surveyors organised each place by moving through the landscape and visually connecting points formed from physical features that could be quantified. Every survey began as a fixed point or *locus gromae* to which surveyors could orient, align and connect all other points in a survey using the abstract principles of the straight, circular or irregularly

curved line. To form circular or irregular lines from straight lines of sight, the points were interpolated using triangles. The lines of sight or *rigores* were the conceptual framework, which allowed surveyors to mentally structure space as place by organising disunited groups of physical objects in the real world into a perfectly ordered abstract pattern. To communicate that organisation to others, surveyors crafted the *forma* as a labelled diagram to transpose the inexact correspondence between imperfect real-world features in the landscape perceived through the senses and the abstract conception of those features as a place defined by labels and drawn lines of demarcation. As such, the *forma*, regardless of whether it depicted the temple-land at a city like *Daulis* or the entirety of the province of *Lycia*, was not a map in the modern sense. Rather it was a pictorial rendering of mathematically arranged features found in the landscape. It could not provide anyone with a guide for travel as an itinerary would, but as the documents from *Daulis*, *Patara* and *Aphrodisias* show, it allowed the viewer to construct and comprehend relationships between objects, places and people. The *forma agrimensorum* and its *commentarium* for example, allowed the viewer to comprehend the social and topographical relationships between individual land-holders in a community.

As Frontinus shows in his discussion of the categories of land, the *forma* could further be used by surveyors to superimpose survey lines on the territory of a community that were not physically present in the landscape, or to introduce conceptual relationships between people for political or administrative purposes. The *forma* also allowed the viewer to situate the reality of a civic territory into a wider conception of a region by depicting the civic landscape oriented perfectly to an ideal north-south alignment and in relationship to the communities that surrounded it. On a larger scale, a *forma* could show how the relationship between cities united by roads and enclosed by boundaries or topographical features should be grouped together and understood as a province or even as the totality of the Empire.

Reading such a document was a skilled art that only a few could do with discernment. Rather, what these documents represented in both their perishable and bronze or marble monumental forms was a concept of collective identity which was there to be viewed and discussed, but only rarely consulted. The surveyor's ability to read these documents and others was one of the ways they validated their identity. Their style of walking, knowledge of topographical taxonomies and an ability to discuss

mathematics while manipulating specialised instruments, such as the *groma*, were other characteristics that set them apart from most people, allowing those to judge ability and choose the best specialist of this craft for a given job.

Of course, not everyone in the Roman world would have either understood or accepted the surveyors and their methods. As stated above in Section 5.4, the number of people in any given province who accepted and employed surveyors changed gradually over time. In the early stages of Roman expansion, only those few who had prior exposure to the Romans would have accepted the presence of surveyors without question. As time passed and the surveyors succeeded in negotiating power relationships between the Romans and themselves and between the Romans and the provincial population, more and more communities would have been willing to employ the services of the Roman surveyors to resolve problems. The epigraphic evidence suggests that by the time Alexander Severus died nearly all communities who claimed land or who made any effort to assert their influence, even if only at a local level on the edges of the Empire, had some experience with the Roman surveyors. Indeed, fresh evidence coming from the Nubian temples at Dehmit and the Iranian siege works at *Dura Europos* suggests that even non-Roman peoples beyond the frontiers employed surveyors trained in the Roman tradition to regulate boundaries and resolve engineering problems in the period between the accession of Vespasian and the accession of Gallienus (3rd century AD).

For those peoples who were in contact with the Roman world and who could not understand or accept the Roman art of surveying, the surveyors' ability to transform and represent the landscape would have been an incomprehensible and frightening force of domination reflecting a foreign power best avoided. For such people the impact of the surveyors' work would have lasted only until the rearing of livestock and the growing of crops caused the markers and pathways to merge back into the landscape. They would not be calling upon the Roman land surveyors to resolve their problems. But for those who chose to engage with the surveyors, either to improve their lot with the Roman imperial administration or gain an advantage over their neighbours, the surveyor's craft provided a powerful performative discourse, negotiated into their way of life, changing the landscape and those who lived in it forever.

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