

# HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia!

John F. Brock

**Keywords:** Emperor Hadrian, Roman Britannia, The Wall, The Vallum, Roman, Surveying, Surveyors Written Instructions (Corpus Agrimensorum Romanum), Vallum Hadriani, Vallum Antonini, International Borders.

## ABSTRACT

“A man’s worth is no greater than his ambitions.”  
– Marcus Aurelius



Fig. 1 A section of Hadrian's Wall in north England showing material and construction type

Much hypotheses and over-thinking has taken place over hundreds of years in an effort to attribute purposes for the raison d'être of the wall across northern Britain erected at the behest of the formidable Roman Emperor whose name has been ultimately used to describe this intriguing edifice.

---

HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017  
Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29–June 2, 2017

Was it built for defence, border control, a demonstration of power or any number of associated intentions as a strategic military device at the extremity of the territorial outskirts of the Great Empire? Many postulations have been advanced by engineers, stone masons, clerks of works, military experts, academics, archaeologists, historians, paleontologists and all the usual suspects.

However I have only sourced one other opinion for its creation put forward by another land surveyor like myself having been offered by my very good friend from the US Mary Root who I see at least once a year at the Surveyors Rendezvous held annually in different locations within the USA to celebrate the local Surveying history of many notable places in the Land of the Free and President Surveyors (please note that US Presidents Washington, Jefferson and Lincoln were all land surveyors!). Well it just so happens that I am not just a practising “historical detective” (as I label those involved in my profession!) but I am an active field historian with a Masters degree in Egyptology from Macquarie University in Sydney. In addition to this area of personal and professional interest I have done considerable research into ancient Greek and Roman surveying together with a diversion into the surveyors of China’s antiquity as a background to my paper “The Great Wall of China: The World’s Greatest Boundary Monument!”

With such a cursory introduction to my own research base I will be making my own offering to the discussion table about what served as the main reasons for the erection of such a notable memorial to the time of the renowned civilization during the second century. After I elaborate further about my analysis of the wall’s design with specific attention drawn to certain features not before grouped together along with a focus on the desires and intentions of Emperor Hadrian himself there may be some agreement that this iconic line across the topography is a true boundary monument in the ancient Roman traditions as a demarcation line of the northern limit of the Empire’s frontier in the north western territory of its second century enforced tenure.

# HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia!

John F. Brock

## 1. INTRODUCTION



“It is not what you look at that counts; it is what you see!”

- Henry David Thoreau,  
Philosopher/Surveyor.

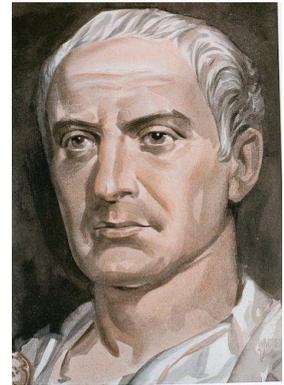
On the five occasions that I have travelled to the United Kingdom on only one instance have I gone by road northwards to Scotland during which I only caught a fleeting glimpse of Hadrian's Wall in 1998. After nearly 19 years I will actually be staying at the town of Wall in accommodation adjacent to this legendary symbol of Roman times within the area such premises having been constructed with stones from the original structure itself. My subsequent curiosity with this ancient Roman masterpiece was propagated by initial readings of various texts and web articles most of which I procured from the UK itself. Most authors have proposed that the Wall had multiple purposes for its installation dismissive of a principal motive for placement as a defensive barrier or fortification suitable for the Roman forces from which to mount an armed resistance. Through my interpretations of the various features of the Wall's design combined with an instinctive feeling for the mood of the Roman Ruler himself I will mount a convincing proposition that the main purpose of Hadrian's Wall was as a boundary monument placed to delineate the dividing territorial line for the northern limit of Roman Britannia at the same time serving notice to any would-be interlopers that any transgressions past that line would bring great trauma.

May I emphasise that my research is not totally exhaustive but I have obtained many excellent publications issued over many hundreds of years which have provided me with a quite broad understanding of how many surveyors were employed by the great Empire to maintain and supervise all matters pertaining to matters of civic jurisdiction and orderly inhabitation of the lands over which claims had been established. Roman Surveying Law and Doctrines were well versed and enforced by a Surveying Profession which bore great esteem and respect along with a dependency on such experts to solve boundary disputes and facilitate the creation and operation of new towns, roads and aqueducts considered vital for the convenience and livelihood of its citizens and vast military regiments.

## 2. JULIUS CAESAR INVADES BRITANNIA

“Veni, vidi, vici” (“I came, I saw, I conquered.”)

– Julius Caesar (47 BC)



The first incursions by Rome across the sea into Britannia were made by Julius Caesar in 55 and 53 BC with continuing intensity over the years under the reigns of subsequent emperors Augustus, Tiberius and Caligula. It would not be until almost another hundred years before the Romans finally conquered Britain in 43 AD when Claudius dispatched four legions to finalise the job and even from then on there was still formidable opposition to keep the usurping legions south of what is considered Caledonia (visa vie later most of Scotland). There was the perception that there was little wealth or suitably arable lands upon which income could be generated added to the tenacity of the battle hardened highlanders whose fight to the death toughness would make many a seasoned soldier reluctant to take them on in their own surroundings. These eras of Rome’s expansionary ambitions are not the basis for this paper but they do serve as a salutary source as to what drove Hadrian to bring about the laying of what has become a renowned landmark of the Roman Empire at its mightiest during the second to the fourth centuries after Christ. What has been labelled “the Fall” of the Roman Empire was already well into its death rolls by the time the Romans ultimately evacuated their Britannic stronghold in 411 during the rule of Emperor Jovinus and his Consul Honorius et Theodosio.

## 3. HADRIAN BECOMES ROME’S EMPEROR



“Better than a thousand hollow words is  
one word that brings peace”

- Buddha

If the word “wall” was inserted where “word” is in this quote it may go some way to explain Hadrian’s strategy to put up his wall in northern Britannia when he toured his western colony in 122.

In 117 AD Rome's second "friendly" regent Trajan passed away leaving control of Rome's extensive holdings to his successor Hadrian who was 41 (born Publius Aelius Hadrianus in 76 possibly in Italica which is now part of Spain – but it has been suggested that in fact he was born in Rome itself?) when taking over control. Rebadging himself as Caesar Traianus Hadrianus Augustus the new ruler clearly portrayed his traditionalist attitude with a distinct bias towards the classical culture of the ancient Greeks along with archaic literature and writings of folklore as well as displaying his veneration for his First Emperor Augustus through the inclusion of his name in that which he had adopted. One writer says that he was a "dedicated devotee of Octavian-Augustus, and had a bust of Octavian in his bedroom." I am sure that his wife was delighted! Shelving the expansionist policies of some of his predecessors which had stretched the capacity of the governing regime to



Fig. 2 Roman Emperor Hadrian

maintain control and order at the extreme edges of those regions far removed from the Rome-based Senate responsible for its existence Hadrian saw the need for more passive measures to be employed. The new ruler embarked on a program to consolidate the current holdings of the dominion in order to minimize the exposure of invasions and raids against the thinly spread legions guarding the vulnerable outer limits of the Empire's furthest perimeters. Hadrian had a resolute character as well as having been remembered as a leader with moderation along with Nerva (96-98), Trajan (98-117) and his successors Antoninus Pius (138-161) and Marcus Aurelius (161-180) collectively referred to as "The Five Good Emperors." In a paradox of his personality his moderation in areas of governance were matched by his extravagance in public works such as the enlargement of The Pantheon and of course the placement of the Britannic Wall. The concept of territorial limits had more to do with the identification of lands currently under Roman control and **those destined to be**, rather than a declaration that the lines identified would remain at the outermost edges of the Empire. There was also a paranoid perception, sometimes justified, that the far removed generals at a tyranny of distance would be driven to forge alliances with those nearby chieftains outside the designated lines and sever ties with the Empire. Emperor Domitian (81-96) introduced frontier works in Germany with timber towers linking forts while Trajan had added fortlets just prior to Hadrian erecting a timber palisade in this colony (PH p.15). Where naturally occurring major landscape features such as rivers, cliffs or water table crest lines existed they were charted as the boundary of the Empire lands for the outside regions.

In legalistic parlance rightful ownership of property is demonstrated by what are referred to as "Acts of Dominion" such as maintaining an estate in good order, paying the required Council rates and land taxes (if applicable), plus various other actions but with one very specific action being tantamount to secure a right of ownership which is the construction of a dividing barrier between one claimant and his neighbour usually being a fence or wall along the property line of subdivision. Hence Hadrian saw an urgent need to clearly demarcate where he believed his line of dominion had reached along the northern frontier of his western colony of Britannia. Done without mutual

---

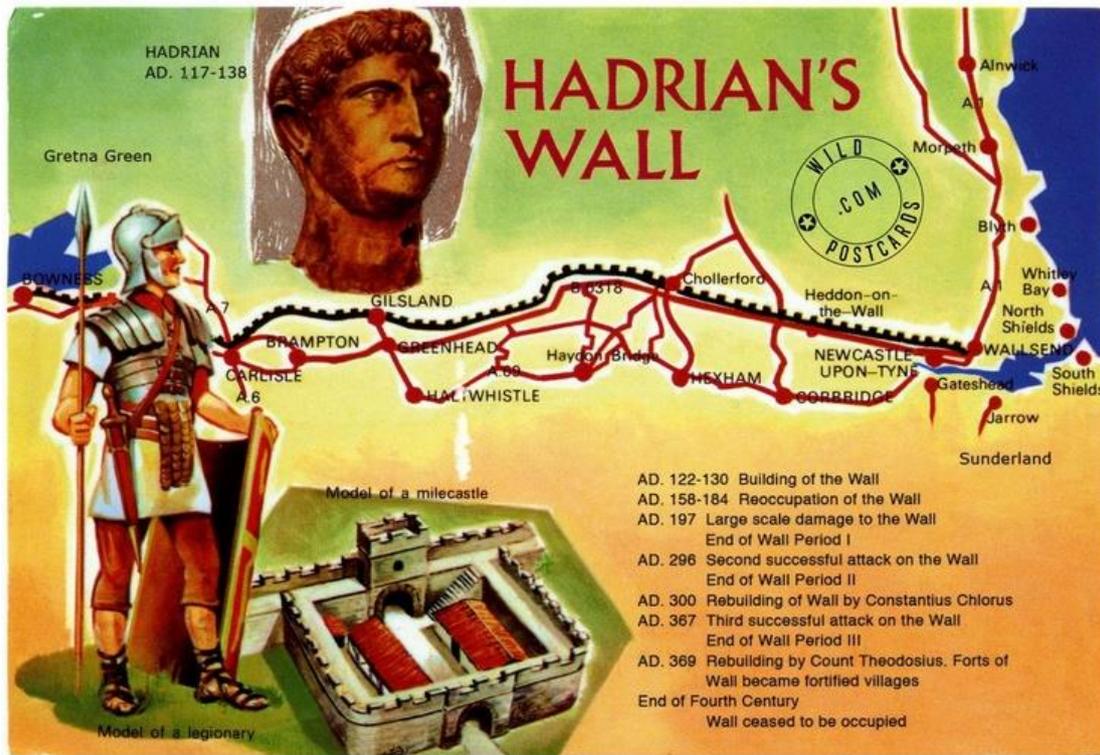
HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017

Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29–June 2, 2017

consent clearly the non consensual parties could only regard the placement of this Wall as an act of aggression or at the very least a provocative signal to future confrontations by the angry rebels.

Through his extensive tour de force inspecting his absolute realm to its entirety Hadrian formulated a capital works program to clearly designate the limits of his power through the placement of artificial lines of demarcation where no natural geography presented itself to adopt as suitable frontier perimeters known as “limes” which were those external boundaries as compared with “limites” being dividing lines between provinces within the overall total regime. During his visit of 122 AD to Britannia he oversaw the erection of the great construction dividing wall 80 Roman miles (a Roman mile was 5,000 Roman feet being equivalent to 4,854 Imperial feet – a pace was equal to 5 Roman feet) from Wallsend-on-Tyne to Bowness-on-Solway along the northern territorial rim of his western colony (a distance of about 120 kms).



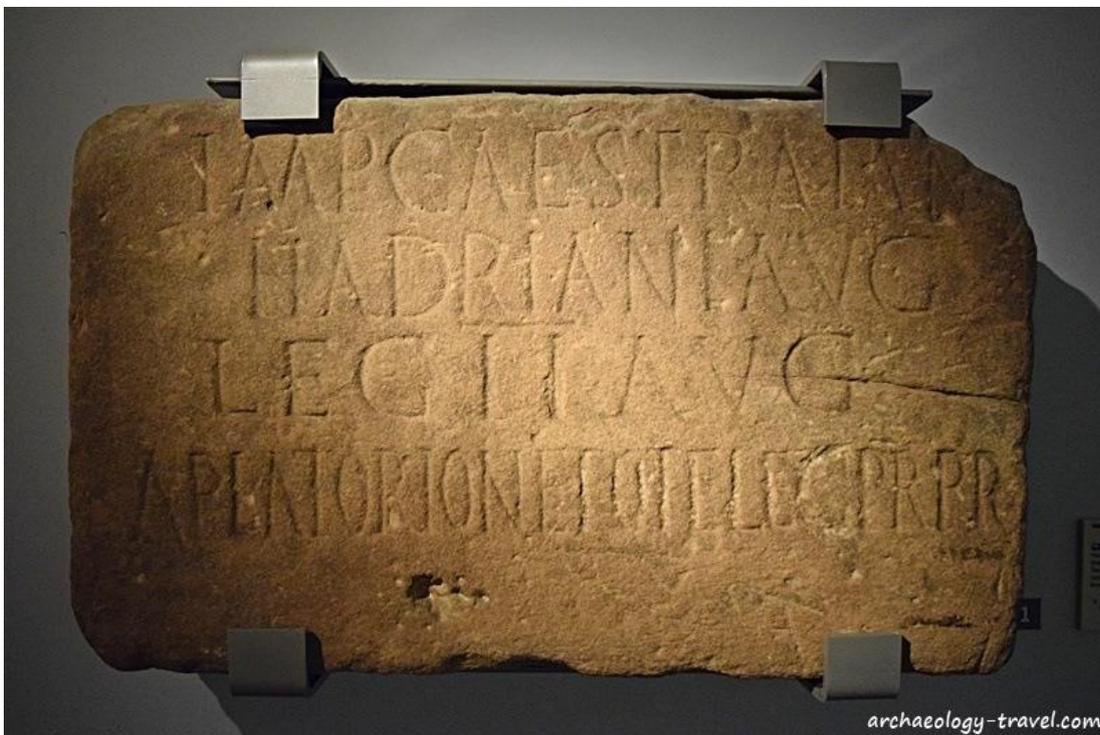
**Fig. 3 A postcard showing Emperor Hadrian’s bust looking over his impressive wall.**

The new leader was determined to enforce “peace through strength” thus devoting his efforts to erect clear symbols of might enclosing all that was his. In so doing he was giving defiant notice to any tribes outside those fortifications who contemplated crossing these barriers with ill intent they most certainly would attract the full retribution of the Roman legions in response. Clearly the Wall was solidly and substantially built but with the relatively sparse positioning of fortlets (with gates) between quite extended stretches of narrow stone walls it was far from impregnable. The gates placed were to allow passage to and from the adjoining lands with a tacit intent of frontier control for selective admissions and exclusions as decreed. For many years after the refocus directed towards the royal edifice since the 17<sup>th</sup> century “rediscovery” of the Wall there was much dispute

HADRIAN’S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017  
Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29–June 2, 2017

about who actually issued the decree to bring about its construction but subsequently two powerful items have emerged to prove conclusively that its paternity belongs to Hadrian himself. Hadrian's alleged biographer Aelius Spartianus from the *Scriptores Historiae Augustae* (translated as *Augustan History*) estimated to have been compiled some time between AD 285 and 335 declares in *Hadrian XI*, 2-6: "And so, having reformed the army quite in the manner of a monarch, he set out for Britain, in 122. There he corrected many abuses and was the first to construct a wall, eighty miles in length, which was to separate the barbarians from the Romans." Then as though the ancient emperor was watching over the modern proceedings and discussions concerning the archaeological investigations and restorations of his paeon glorious in 1715 at Hotbank Milecastle No. 38 an inscribed slab of stone (now held in the Great North Museum, Newcastle) was discovered dated to the time of Britannic Governor Nepos from 122-126 AD which in Latin states: "Imp(eratoris) Caes(aris) Traiani / Hadriani Aug(usti) / A(ulo) Platorio Nepote leg(ato) pr(o) pr(aetore)", translated into English saying: "Of the emperor Caesar Traianus Hadrianus Augustus, the legion II Augusta (built this), while Aulus Platorius Nepos was legate with powers of a praetor."



**Fig. 4 Stone inscribed c. 122-124 to verify that Hadrian's Wall had been authorised by the Emperor personally around 122 that section having been built by Legion II Augusta.**

Indeed another monumental artefact bore witness to the approximate completion date of the Wall around 136 adding testimony to one of the other total of three legions which carried out the massive project found near the east gate of Moresby fort translated to read: "(This work) of the Emperor Caesar Trajan Hadrian Augustus, father of his country, the XX Legion Valeria Victrix (built)." (stone dated 128-138). This was one of the most sensational finds in the history of the

---

HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017  
Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29-June 2, 2017

archaeological investigations of Hadrian's Wall proving beyond any other speculation about someone else ordering its construction that Emperor Hadrian was its patron.

Another parallel for a stone wall erected as a solid symbol of ownership to those outside hordes are the early stages of China's Great Wall initiated by the first Emperor some time around 200 BC. The wall's height and breadth could not prevent them crossing it but any such breach of the stone ramparts was a sure passport to big trouble for those warlike groups not remaining on their side of it. The more well known Great Wall of China with high walls lined with castellations along wide interconnecting fortifications was modified and amplified to this impressive megastructure during the Ming Dynasty (1368-1644) but this battle-ready bastion saw very little wartime activity during the tenure of this legendary ruling clan famous for their ornate blue pottery.



Fig. 5 A section of the Great Wall of China showing some fortlets.

#### 4. THE APPARENT ENIGMA OF THE VALLUM – ITS REAL FUNCTION

“Once we accept our limits, we go beyond them”

– Albert Einstein

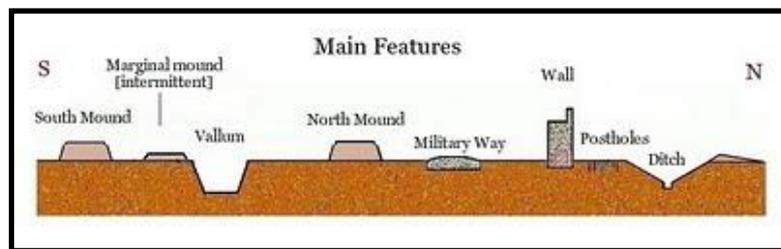
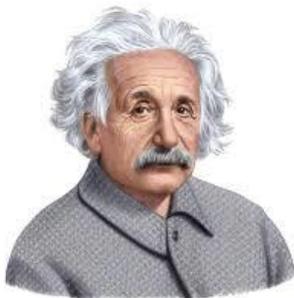


Fig. 6 Cross sectional diagram of the Wall construction

---

HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017

Surveying the world of tomorrow - From digitalisation to augmented reality

Helsinki, Finland, May 29–June 2, 2017

Many writers have dismissed the inclusion of the Vallum as inexplicable in its function. The Vallum is a trench dug inside the south side of the Wall with earth mounds lining the top edges on both sides running for its entire length apart from where natural features like rocky outcrops or river banks interrupt its progress. One author states that it has been surveyed like a road but is unlikely to have been used for this reason while another pronounces it may have been included as an additional defensive mechanism as an obstruction to invading armies. At its depth and location in addition to the many lengths of narrow wall too thin from which to wage even defence by a single line of archers let alone catapults or pots of boiling oil it would appear less probable that the Vallum was placed to serve any credible second line of resistance after this first ineffective barrier had been breached by any sizeable swarms of invading marauders.

If I may digress now to a much earlier archaic period in pre-Roman history in support of my suggestion that the Vallum in fact formed part of the traditional techniques of construction adopted for the creation of boundaries first attributed to Aeneas who is said by mythology to be the direct ancestor of Romulus and Remus, the mythical wolf-suckling twins who founded Rome.

As an illustration of the extent to which the Romans incorporated the establishment of new towns into their folkloric sagas the writer Virgil describes how Aeneas founded a city in Sicily:

“Meanwhile Aeneas marks the city out  
By ploughing; then he draws the homes by lot”

All Roman Surveyors were aware through their training of the old custom whereby the limits of a new town were marked out by the consul by ploughing a furrow around it. Another author Ovid, a studier of the law including that pertaining to surveying, said that the dividing up of land with balks (*limites*) by a “careful measurer” (*cautus mensor*) emphasised the importance attached to the art of surveying.

The line drawn around a town was referred to by Virgil as *sulcus primigenius* (“the original furrow”) and was monumented with boundary stones according to Tacitus and Plutarch. Actual boundary stones have been discovered at Capua placed during the Second Triumvirate bearing inscriptions “By order of Caesar (Octavian), on the line ploughed”. When the Emperor wanted to extend the limits of Rome he maintained the traditional inclusion of the “original furrow” placing inscriptional carved boundary stones which are still present today in evidence to his realignment of the boundaries of the eternal city.



**Fig. 7 Caesar Augustus coin (29-27 BC) with the ploughing of Rome’s first boundary furrow**

Revered first Emperor Caesar Augustus so much cherished the ancient folklore of Rome that he had a Denarius coin struck dated c. 29-27 BC with his bust on the obverse and the ploughing of Rome’s first boundary furrow on the reverse during his reign for the citizens to bear recognition of their hallowed traditions. Emulating his legendary idol Caesar Augustus Hadrian was not going to miss a chance to present himself in a similar portrayal of

HADRIAN’S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

himself as the City Founder ploughing the new boundaries with a team of oxen on a coin from Aelia Capitolina (Jerusalem) in about 131-136 AD in a very clear demonstration of his admiration for his predecessor together with the folkloric divine creation of a *limes* in the form of a Vallum or Pomerium.



**Fig. 8 Hadrian coin (c.131-136 AD) with the symbolic ploughing of a new first boundary furrow.**

Indeed the folklore of the birth of Rome itself said to be in 753 BC has Romulus and Remus as direct descendants of the Trojan Prince Aeneas founding the new city. One version of the myth has Romulus cutting a *sulcus primigenius* (first furrow) around the perimeter of where he decreed the city limits to be incorporating the Palatine and Capitoline Hills just as his ancestor Aeneas had done in other towns before him in what is believed to be an Etruscan ritual which was inclusive of the proposed line undergoing selection and final placement by auguries exercising divine control. In this recital of the folkloric epic when Remus ridicules this action by his brother by jumping back and forth over the sacred furrow Romulus kills him in what must be regarded as an extreme act in border control indeed. Subsequently a substantial wall was erected outside this trench with the area between the inside of the wall up to and including the ditch being termed “The Pomerium” within which building construction was forbidden together with other bans prohibiting various legal actions otherwise enforceable within the inner property zone by the duly empowered judicial appointees. Entry from outside this line of strong delineation could take place only with permission granted by those authorities entrusted with the protection of the livelihoods of the citizens of Rome. In fact the dictator Lucius Cornelius Sulla expanded the limits of the City of Rome in 80 BC in an act of absolute power with his new town limits further marked out by white marker stones called *cippi* which were commissioned by Claudius to delineate his extension of The Pomerium some of which survey monuments are still in situ today as recorded by Tacitus and outlined by Aulus Gellius.

The Romans even had a god called Terminus - God of the Boundary Stones closely affiliated with the principal deity Jupiter. Indeed it is the Romans who introduced the Feast of Terminalia which is an annual ceremony with pomp, pageantry and identification of the boundary stone monuments designating the area within which protection is guaranteed and order maintained. Boundary stones took many different forms with particular types of monuments being set to indicate the nature of the tenure under which the enclosed properties were held.



**Fig. 9 Terminus as a boundary stone.**

Another absolutely splendid effort in scholarly publishing is Brian Campbell's handsome volume on "The Writings of the Roman Land Surveyors" (in Latin *Corpus Agrimensorum Romanum*) which most astutely translates the Latin texts of the Roman authors who compiled a veritable instructional handbook on how surveying was to be conducted within the Roman Empire. May I say that this work is extraordinary and has given me a detailed appreciation for the technical and judicial expertise which was vested in the Surveyors privileged to undertake such activities for the administratively thorough control imposed upon its charges. I need to clarify the interpretation of the word *Vallum* as literally it means a "mound of earth" but in the context of Hadrian's Wall it more specifically describes the trench following the line of the *limes* or boundary line which has mounds of earth along its top edges just as the *sulcus primigenius* ("first furrow") had placed along its upper edges formed from the earth excavated from the trench itself. To my amazement and delight on page 273 of Brian's superb book he deciphers the original Latin text in the Section "...Discussion About Lands" to say: "*Villa* comes from *vallum*, that is, a heap of earth, which is normally established in front of a *limes*" which is actually the borderline of the outside extremity of a Roman frontier dividing it from international lands held by neighbouring nations or peoples. Furthermore on page 263 under the title: "Here Begins a Discussion of Boundary Markers Set Up in Various Provinces" is stated:

"I have established a small ditch, which was dug out, on a boundary as a marker.  
Bigger ditches you will also certainly find as boundary markers.  
You will undoubtedly discover a raised *limes*, that is, a balk.  
I have built walls from limestone to mark boundaries.  
I have established banks that have been dug out to mark boundaries.  
You will find piles of earth marking boundaries."

These incredible discoveries add firm weight that the *Vallum* incorporated within the design specifications for Hadrian's Wall was following those strict instructions laid down in the Roman Surveyors Instruction Manual for the presentation of an International Border Line. This invaluable nexus to the times of the Roman surveyors translates a voluminous corpus of texts providing all historians but more especially surveyors with a detailed overview of what types of boundary marking were carried out, classifications of land types, as well as all manner of natural feature which could be adopted as boundary lines where suitable. There are even descriptions and diagrams of what style boundary markers and boundary stones were to take in given circumstances. For any interested Surveyor historian this publication is a must-have and I would recommend the supplier "Book Depository" on the internet who have the best price together with **free delivery anywhere in the world!**

In an historical essay in what has been termed by its composer as "the puzzle of the Vallum" this scholar went one giant step towards explaining "the inexplicable!" Published in a 1921 issue of a journal called "The Vasculum" R.G. Collingwood titled his work: "The Purpose of the Roman Wall" in which he says: "... the continuous line was at first designed to serve simply as a mark to show where the Roman territory ended." Precisely Mr. C as any suggestion that the Vallum was a defensive earthwork is itself indefensible. For rampaging bands of villains it was merely a ditch with a speed hump. He goes on to reiterate: "The puzzle of the Vallum simply disappears when it is suggested that it was not a defensive work but a frontier-mark, a line indelibly impressed upon the

---

HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017

Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29-June 2, 2017

earth to show the wandering native where he might not go without accounting for his movements.”  
Could not have said it better myself!

Well I am now going to propose a more definitive reason and origin for the placement of the Vallum combined with its true purpose. It surprises me that none of these astute writers who are perplexed by the Vallum have not seized upon the very first indicator of why this structure was an essential element of this territorial border line – the Roman names first applied to it were the Vallum Hadriani or the Vallum Aeliani or Aelium (Hadrian’s family name was Aelius). With strict adherence to the instructions issued to the Roman land surveyors to delineate a *limes* (international line of demarcation) it was an explicit directive to make a Vallum (literally “earth mound”). Naturally to form the earth mound required to construct this visible line of subdivision the quickest way available the legionary project supervisors devised the earthwork technique of digging the required quantity of material from the ground leaving a trench alongside then stacking the spoil solidly along the edge of this continuous excavation. Hence once again illustrating the interpretation of the meaning of a Vallum evolved to include the trench AND the mound in its description.

With the benefit of the aforementioned facts to corroborate my following pronouncement may I propose that the Vallum was the first inclusion in the design for the *limes* (boundary line) to demarcate the northern limit of Rome’s Empire with the famous Wall an additional barrier added to provide a show of power. The western part of this *limes* was initially placed consisting of a Vallum only until the stone creation was extended sometime later to complete the imagery of dominance. Thus the creation of the Vallum was the first step in the establishment of this northern borderline once again with the more sturdy stone divider being set at some time well after the first delineator had been laid down.

## 5. WALL DESIGN AND CHARACTERISTICS

“Make the workmanship surpass the materials.”

- Ovid (43 BC-17 AD)



A burning question which has divided all scholars on the planning, design and project management of this major construction in the Roman capital works program has been just how much direct personal association the Emperor Hadrian himself had in its detail and execution. Well another author with whom I forthrightly concur is Paul Frodsham who mounts a compelling argument in his book: “Hadrian and His Wall” that the architecturally inclined Ruler not only had input into the pre-planning of the Wall’s design but also personally directed some aspects of the building work while on his site inspection during the Britannic leg of his Royal Tour. With such a notion in mind it is not hard for me to further incorporate Hadrian’s penchant for history and tradition as alluded to previously in hypothesizing that the Vallum was added during the erection of the Wall at its earliest incarnation to create the true legendary image of a boundary line as had been initiated by Aeneas, Romulus and a host of his predecessors in very much a recreation of The Pomerium originally enclosing the Eternal City of Rome itself. Such a final masterpiece with historic overtures would

---

HADRIAN’S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017

Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29–June 2, 2017

most certainly have pleased the man mostly honoured with the exceptional monument bearing his name for posterity to admire and marvel upon.

Within the wall were incorporated what have been called milecastles due to their occurrence at every Roman mile thus totalling 80 with two turrets in between each of these structures to provide look out posts at each intervening 1/3 Roman mile thus adding up to be about 160 thereto. Apart from offering a view to the north to detect foreign troop movements all of the manned stations looked more clearly towards the south to allow for a continuous ability to forewarn regiments of soldiers camped within the forts and villages of impending assault.

As has been irrefutably established by many more learned of the Wall than I for a considerable percentage of its length it was not a fortified bastion or even bore formidable dimensions to singularly deflect any major incursions. The size of the Wall varied from a nominal height of 10 feet (3 metres) with an equivalent width up to 20 feet (6 metres) high also with a matching girth so for much of its coverage the sections with the lesser height presented no significant restriction to those warring groups who wished to create conflict on their foreign oppressors.



**Fig. 10 Photo of the US/Canada borderline which is the unfenced trench at Blaine in Washington state**

A modern example of a trench being placed to demonstrate the division between two countries can be found even today on the US/Canadian borderline at the north western US town of Blaine within the which my very good friends Denny and Delores Demeyer reside. Even though the depth and width of this sunken barrier does not preclude access there will always be a very interested US Border Patrolman staking out his continuous vigil on the southern side of the border keeping a very concerned eye over anyone making an unauthorized or uninvited crossing of this line of division with a similar intent as those Roman sentries who

manned the turrets along the lengths of Hadrian's Wall.

## 6. SURVEYING AND BUILDING THE WALL



“Every wall is a door”  
– Ralph Waldo Emerson.

I am sure that Hadrian had no desire to make his Wall anything like a door to encourage hostile northern tribes to cross into the Roman domain but the deterrent qualities of his Wall were not so physical rather than more indicative for in some ways his Wall was very passable not representing a true decisive barrier to opposing camps. Three legions were assigned the duty of erecting this symbol of territorial division II Augustus, VI Victrix and XX

Valeria Victrix but upon its completion it was manned by auxiliaries rather than the legions themselves which were called to other pressing duties somewhere removed within the extensive perimeter of the Roman Empire. There is some inscriptional evidence for a detachment of the British Fleet making some of the granaries at the forts.

All materials used on the Wall construction were quarried locally thus giving the final product a variety of finish only possible through the utilisation of natural resources sourced from the surrounding geological deposits with their distinctive evolutionary origins and nearby timber where such wooden carpentry was included or necessary.

Through a very excellent and thoroughly researched publication by Peter Hill titled: “The Construction of Hadrian’s Wall”, Peter has estimated just how many legionary surveyors were available to carry out the task of surveying the long straight sections of the wall construction as well as the likely work schedule providing a likely time for completion of the survey work required. For the reconnaissance and surveying required to facilitate the site selection and final positioning of the Wall I have formulated the Survey Work Statement for the activities necessary for a project of this proportion. Departing from any possible ritual selection of the Wall’s location by the Consul or auguries the ultimate function of this divisional barrier was to signify the limit of territorial governance while also setting an adequate line of sight both northerly and southerly for the sentries on watch to detect any likely trouble which may have been brewing along with the dual capacity to sound the alert of any likely attack.

Later I am going to inform you of how many surveyors were available to each Roman legion as indicative of just how much manpower was devoted to the vital capacity of carrying out the survey requirements for the Roman nation throughout its widely distributed colonies.

The first duty was to survey and fix the exact line of the Wall such location governed by the preceding parameters of sight lines and prevailing topography taking into account interceding natural features which themselves could serve as obstructions to foreign access such as cliffs, riverbanks and whinsills. Due to the extensive period of time during which the nearby land had already been under occupation it is quite likely that the preliminary scouting party had a fairly definitive idea of where the Wall would be best placed with the crags of the whinsills dividing the future work into western and eastern sectors punctuated by this extant natural barrier building westerly towards the Solway Firth and in the opposite direction to the Tyne River. During this

---

HADRIAN’S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017

Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29–June 2, 2017

reconnaissance the surveyors would have left small rock cairns possibly with a small line of stones in the direction towards the next visible marker or landmark as well as stakes between which the later construction survey parties could align straight sections of wall and make realignments for angles where necessary. As these probably wooden stakes may not have been painted one contemporary Republican author named Polybius (200-118 BC) on the Roman surveyors observed these men placing stakes with flags on them for easier sighting against a camouflaged backdrop of similarly textured vegetation. The ultimate route chosen ran between the banks of the River Tyne near Wallsend on the eastern seaboard and the shores of Solway Firth at the western end. Peter Hill estimates that there were about 10 *mensores* (surveyors) present in each legion forming part of a group known as the *immunes* as with their fellow professional compatriots such as architects, engineers, builders et al as they were immuned from carrying out other military work due to the requirements of their designated speciality. The surveyors were called *mensori* (singular *mensore*) with a team of them referred to as a *metatore*. This meant that there was a surveying pool of around 30 surveyors to lay out the straight lines where they could fit the landscape as well indicating the spots for the erections of milecastles (every Roman mile) with two intermediate turrets (or look out towers) at around 1/3 mile separation in addition to selecting sites for troop encampments for the total workforce.

Without reiterating the specifics of Peter's calculations if I may I will summarise the final approximations of the various sections into which the legionary surveyors may have split their overall task. In Wall miles the likely sections surveyed were Wallsend to Ouseburn 3 miles; Ouseburn to Dere Street 18 miles; Dere Street to North Tyne 5 miles; North Tyne to the eastern end of Whin Sill (MC34) 7 miles; Whin Sill 13 miles; Western end of Whin Sill (say MC46) to Irthing 3 miles; Irthing to the Eden 17 miles; Eden to Bowness 14 miles. Peter's predicted time to complete the initial survey, setting out the milecastles and turrets most probably from one end together with straight alignments and angles when required could have done in about a month. Subsequent construction of the Wall itself is believed to have taken at least fourteen (14) years with some later modifications being added after this time where such additions were regarded necessary. Thus the anticipated completion date for the Wall came only two years before Hadrian's passing which meant that he never got to finally witness his testimonial before his death.

## 7. HOW LONG DID HADRIAN'S WALL LAST?

“The reward of a thing well done is having done it.”  
– Ralph Waldo Emerson

Between 139 and 140 (or some say 142) Hadrian's successor Antoninus Pius had what is now known as The Antonine Wall built of earth and timber substantially further north at about 140 miles (224 kms) by road than the Wall we are more concerned with connecting a shorter overall distance of 37 miles (59 km) from the Firth of Forth to the Firth of Clyde. Once again the antiquarian Roman name given for this newly positioned *limes* was the Vallum Antonini and this new construction conformed rigidly to the written regulation to make it a Vallum with the compacted earth mound along the rim of the dug out channel. This earth wall standing at approximately 10 feet (3m) tall with an average width of 16



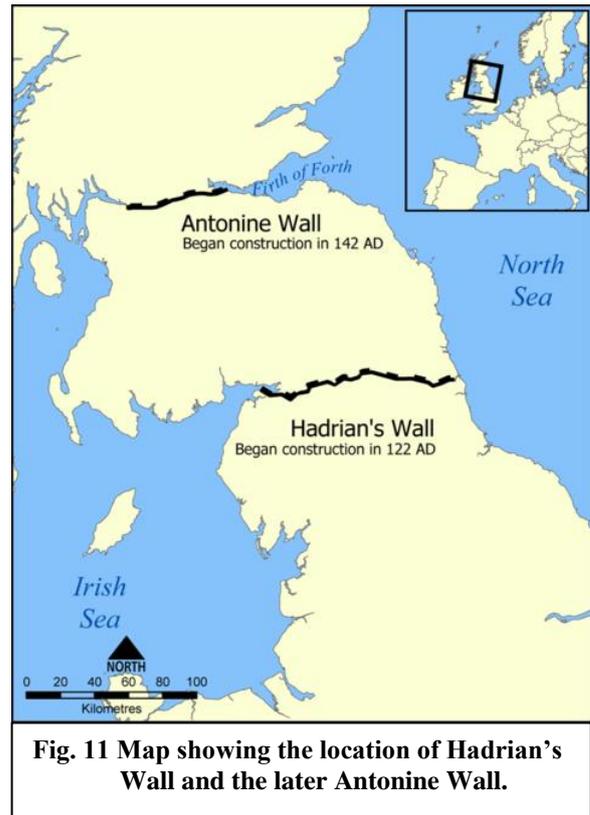
---

HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017

Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29–June 2, 2017

feet (5m) so making this structure an even less imposing deterrent to possible invasion than Hadrian's Wall did. As monitoring and observation of foreign troop movements was vital watch towers and fortlets made of timber were inserted along this shorter territorial limit around 100 miles (160 kms) directly north of its more impressive southern counterpart. Even though it had been further strengthened with the insertion of more forts along its length the order to abandon this later less substantial barrier was given in 163 with a troop withdrawal back to the more substantial wall. With reasons unclear there are some who attribute this retreat to an uprising by the Brigantes with 15 years of revolts ensuing with other tribes joining the feisty Caledonians. Periods of rebuilding Hadrian's Wall due to damage incurred during this ongoing resistance served to reinforce the importance of this northern bastion in Rome's colonies along with providing it with greater longevity which allows us to enjoy and study it in the 21<sup>st</sup> Century. Along with a letter sent in 410 from Roman Emperor Honorius to the Roman Britannic forces "to look to their own defences" against the accelerating hostility from the Saxons, Scots, Picts and Angles came a refusal by Rome to send any reinforcements thus sounding the death knell for Roman Britain. However Hadrian's Wall had represented the symbol of the northern frontier of the Roman Empire in the West for nearly 300 years being now a celebrated treasure for archaeologists, historians and land surveyors to swoon and walk over instead of the hordes of angry tribesmen intent on vengeance during its time as a boundary divider.



their own defences" against the accelerating hostility from the Saxons, Scots, Picts and Angles came a refusal by Rome to send any reinforcements thus sounding the death knell for Roman Britain. However Hadrian's Wall had represented the symbol of the northern frontier of the Roman Empire in the West for nearly 300 years being now a celebrated treasure for archaeologists, historians and land surveyors to swoon and walk over instead of the hordes of angry tribesmen intent on vengeance during its time as a boundary divider.

## 8. SURVEYORS: ROME'S ULTIMATE LAND EXPERTS – LET'S MEET ONE!

"Waste no more time arguing what  
a good man should be. Be one!"  
– Marcus Aurelius



We know that surveyors were on the list of *immunes* because a list of specialists for the legions was compiled in the sixth century in a law code copied from an earlier (list) put together by a man known under many similar aliases as Taruttiensus Paternus, Tarruntiensis or Tarrutenius who was possibly the same individual mentioned by writer Dio as *ab epistulis Latinis* (secretary for Latin correspondence) to Marcus Aurelius then acting as independent military commander in 179 AD. The military manual written by this man was titled *De Re Militare* or *Militarium* listing the tasks to be carried out by stone cutters, carpenters, glass workers,

---

HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017

Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29–June 2, 2017

plumbers, cartwrights, blacksmiths, coppersmiths, lime-burners and charcoal-burners, surveyors and ditchers as well as several clerical immunes keeping legionary records of strength, enlistments, discharges, transfers, expenses and pay records. *Architecti* were also included as most essential with two known to be Amandus at Birrens and Aelius Verines at Mainz.



A most exciting discovery was a record of the discovery of stone altar in 1709 at a place called Coniscliffe which I can gather is near Piercebridge which unfortunately is now lost. From the adjacent sketch the inscription is interpreted to say:

D(eo) M(aris)  
 Condati  
 Attonius  
 Quintianus  
 Men(sor) evoc(atu)s imp(erratu)m  
 Exins(su) sol(vit) l(ibens) a(nime)

**Fig. 12 Stone altar of Attonius Quintianus**

This inscription translates to be: “To the god Mars Condates, Attonius Quintianus, **Surveyor Evocatus**, gladly fulfilled the command by order.” What a brilliant find decoded by Gales, Thoresby and Horsley said to be placed between 43 and 410 AD so most probably during the time frame associated with Hadrian’s Wall but more thrillingly it was funded by a Surveyor who is purported to be at the time a Mensor Evocatus which is a military specialist having completed in excess of 16 years service purported to be receiving a most impressive salary of 200,000 sesterces per annum and may even have attained the rank of chief centurion or praefect which is of great eminence within the realms of the Roman legions. To understand the value of the Roman currency at the time that this surveyor lived please see Appendix C at the end of this paper. However I will quantify our man’s salary through comparison with other amounts paid to differing levels of officials and legionaries. From the time of Domitian (81-96 AD) a legionary was paid 1,200 sesterces per annum, a Centurion 20,000, a Chief Centurion 100,000, a Procurator 60,000-100,000 while a Senior Proconsul, the Prefect of Egypt and a senior Legate were on a hefty 400,000 pa. A small farm was valued around 100,000 while an upmarket seaside villa in Italy or large estate in the same country would set you back 3 million sestarcas. Thus our man Attonius was doing very very well indeed so it is not unexpected that another erudite Roman official would portray the land surveyor in the image of some sort of wizard or great mediator in his illustrious 5<sup>th</sup> century dissertation. It is heartening to note that a Councillor in some Italian towns was paid 100,000 per annum being half of what our surveyor Attonius was believed to be worth!

Without having to explain to other surveyors the essential and indispensable work done by all of our illustrious colleagues it is time for me to once again cite the description of a Roman official from a time late in the civilisation’s existence even after the crushing defeats at the hands of at a time when it would be contemplated that all authority had been usurped from those legionary surveyors which were part of an elite squad of professionals known as “the immunes.” Enriching the status already attained by the land surveyors of Rome during the mightiest eras of this imperious Empire it is not

---

HADRIAN’S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
 John Brock (Australia)

surprising that erudite and astute Roman officials such as Cassiodorus when referring to the agrimensore (land surveyor) could proclaim:

**“He walks not as other men walk !”**

To see the entire quotation of this very wise and astute man please look up my previous paper “Four Surveyors of Caesar: Mapping the World” to understand a full appreciation for just how well regarded the Roman surveyors were combined with the awe with which their activities were held in Roman society.



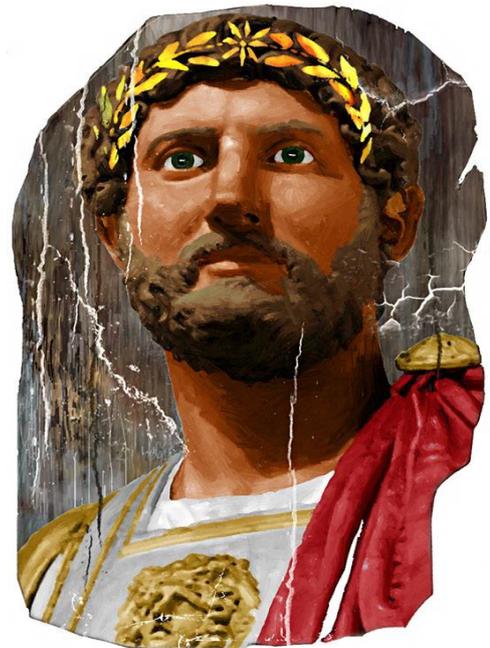
## 9. CONCLUSION

Hence to summarise my analysis of Hadrian’s Wall may I please pronounce that the Wall had a principal function as a boundary demarcation monument which designated the limit of the territory for which Rome claimed jurisdiction and control over while being built with symbolic recognition for the traditional formation adopted by the mighty Empire for the limits of its cities and lands from the very first *sulcus primigenius* marked out by the Founder of Rome which included such a first furrow or trench adjoining the earthen mound known as the Vallum which was the actual boundary of the *limes* or International Boundary Line for the Roman Colony of Britannia.

For such a idyllic model of Roman greatness in engineering and surveying to be so widely recognised by anyone anywhere in the world truly links our profession with another legendary landmark which serves as testimony to all who hear about or study this ancient edifice to the skills that surveyors have demonstrated from the earliest times of history even before such feats were recorded by the first historians.



**Fig. 13** Hadrian's mausoleum in Rome at the Castel Sant'Angelo.



**Fig. 14** Hadrian the Great Emperor.

It makes me proud and truly grateful to see a nation like Finland whose surveyors have been forthright in claiming their rightful status within the community and with whom it is a delightful privilege and distinction to share this memorable FIG Working Week at Helsinki in 2017 amongst men and women of dignity and achievement of all ages from all corners of the globe (even though the globe is an oblate spheroid?).

## **10. DEDICATION AND APPRECIATION**

May I take this opportunity to dedicate this paper and presentation to my very best friend in the World of Surveying History Jan De Graeve, Chairman of our FIG International Institution for the History of Surveying and Measurement from Brussels in Belgium for his dedicated and tireless devotion to preserving and highlighting the marvels of the History of Surveying across the entire planet demonstrative of his passionate love of our most colourful Profession. Jan's encouragement and support to me over the many years during which we have known each other since the wonderful XX FIG Congress in Melbourne in 1994 have always driven me to go further than circumstances would permit and my obsessive love of Surveying History is matched only by my love for him.

---

HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017  
Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29–June 2, 2017

## APPENDIX A

Reproduction of a 1250's Map of Britain by Matthew Paris (who was a monk at St. Alban's Abbey) showing both Hadrian's Wall and the Antonine Wall despite being depicted incorrectly in a geographical perspective.



HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017  
Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29–June 2, 2017

## APPENDIX B

### Table of Roman Standards of Distance Measurement

1 Roman inch = *uncia* = 0.97 Imp. inch = 24.6 mm  
1 Roman foot = *pes* = 0.97 Imp. foot = 0.296 metre  
1 pace (*passus*) = 5 Roman feet = 4.854 Imp. feet = 1.48 metres  
1/8 Roman mile = 125 paces = a *stadium* = 625 Roman feet = 607 Imp. ft (185m)  
1 Roman mile = 1000 paces = a *miliarium* = 5000 Roman feet = 4854 Imp. feet  
= 1479.5 metres  
1500 paces = a *lewa* = 7500 Roman feet = 7281 Imp. feet = 2219 metres

## APPENDIX C

### Table of Roman monetary values

1 gold aureus = 25 silver denarii = 100 bronze sesterii = 400 asses  
1 silver denarius = 4 bronze sesterii = 16 asses  
1 bronze sestertius = 4 asses

## APPENDIX D

### List of Roman Emperors during the Imperial Period from Augustus to the abandonment of Hadrian's Wall in 411 AD

<b><u>Julio-Claudian Dynasty</u></b>	<b><u>27 BC – 69 AD</u></b>
Augustus	27 BC – 14 AD
Tiberius	14 – 37 AD
Gaius Germanicus (Caligula)	37 – 41 AD
Claudius	41 – 54 AD
Nero	54 – 68 AD
Galba	68 – 69 AD
Otho	69 AD
Vitellius	69 AD
<b><u>Flavian Dynasty</u></b>	<b><u>69 – 96 AD</u></b>
Vespasian	69 – 79 AD
Titus	79 – 81 AD
Domitian	81 – 96 AD
<b><u>The Five Good Emperors</u></b>	<b><u>96 – 180 AD</u></b>
Nerva	96 – 98 AD
Trajan	98 -117 AD
<b>Hadrian</b>	<b>117 – 138 AD</b>
Antoninus Pius	138 – 161 AD
Marcus Aurelius	161 – 180 AD

---

HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017

Surveying the world of tomorrow - From digitalisation to augmented reality

Helsinki, Finland, May 29–June 2, 2017

<b><u>Antonine Dynasty</u></b>	<b><u>138 – 193 AD</u></b>
Antoninus Pius	138 – 161 AD
Marcus Aurelius	161 – 180 AD
<i>with</i> Lucius Verus	161 – 169 AD
Commodus	177 – 192 AD
<i>with</i> Marcus Aurelius	177 – 180 AD
Pertinax	193 AD
Didius Julianus	193 AD
Pescennius Niger	194 AD
<b><u>Severan Dynasty</u></b>	<b><u>193 – 235 AD</u></b>
Septimus	193 – 211 AD
Caracalla	211 – 217 AD
<i>with</i> Geta	211 – 121 AD
Macrinus	217 – 218 AD
Diadumenianus	218 AD
Elagabalus	218 – 222 AD
Alexander Severus	222 – 235 AD
<b><u>The Soldier Emperors</u></b>	<b><u>235 – 305 AD</u></b>
Maximinus I	235 – 238 AD
Gordian I and II (in Africa)	238 AD
Balbinus and Pupienus (in Italy)	238 AD
Gordian III	238 – 244 AD
Philip the Arab	244 – 249 AD
Trajan Decius	249 – 251 AD
Trebonianus Gallus ( <i>with</i> Volusian)	251 – 253 AD
Aemilianus	253 AD
Gallienus	253 – 260 AD
<i>with</i> Valerian	
<b><u>Gallic Empire (West)</u></b>	
following the death of Valerian	
Postumus	260 -269 AD
Laelian	268 AD
Marius	268 AD
Victorinus	268 – 270 AD
Domitianus	271 AD
Tetricus I and II	270 – 274 AD
<b><u>Palmyrene Empire</u></b>	
Odenathus	c.250 -267 AD
Valballathus ( <i>with</i> Zenobia)	267 – 272 AD

---

HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017

Surveying the world of tomorrow - From digitalisation to augmented reality

Helsinki, Finland, May 29–June 2, 2017

### **The Soldier Emperors (continued)**

Claudius II Gothicus	268 – 270 AD
Quintillus	270 AD
Aurelian	270 – 275 AD
Tacitus	275 – 276 AD
Florianus	276 AD
Probus	276 – 282 AD
Carus	282 – 283 AD
Carinus	283 – 284 AD
Numerianus	283 – 284 AD
Diocletian ( <i>and</i> Tetrarchy)	284 – 305 AD

### **Western Roman Empire**

Maximianus	287 – 305 AD
Constantinus I	305 – 306 AD
Severus II	306 – 307 AD
Constantine I (The Great)	307 – 337 AD

### **Eastern Roman Empire**

Diocletian	284 – 305 AD
Galerius	305 – 311 AD
Maxentius (Italy)	306 – 312 AD
Maximinus Daia	309 – 313 AD
Licinius	308 – 324 AD

### **Constantine Dynasty**

### **337 – 364 AD**

Empire reunited by Constantine's defeat of Licinius	
Constantine II	337 – 340 AD
Constans	337 – 350 AD
Constantius II	337 – 361 AD
Magnentius	350 – 353 AD
Julian	361 – 363 AD
Jovian	363 – 364 AD

### **Western Roman Empire (after death of Jovian)**

Valentinian	364 – 375 AD
Gratian	375 – 383 AD
Valentinian II	375 – 392 AD
Eugenius	392 – 394 AD
Honorius	395 – 423 AD

### **Eastern Roman Empire (after death of Jovian)**

Valens	364 – 378 AD
Theodosius I	379 – 395 AD
Arcadius	395 – 408 AD

---

HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017

Surveying the world of tomorrow - From digitalisation to augmented reality

Helsinki, Finland, May 29–June 2, 2017

(From the Department of Greek and Roman Art, The Metropolitan Museum of Art October 2004)

## BIBLIOGRAPHY

- 1/ Breeze, David, **Hadrian's Wall – English Heritage Guidebook**,  
(English Heritage, 2015).
- 2/ Breeze, David, **The Antonine Wall**, (Birlinn Ltd., UK, 2009).
- 3/ Brock, John F., “Four Surveyors of Caesar: Mapping the World”,  
**FIG History Symposium**, (FIG Working Week 2012, Rome, Italy).
- 4/ Brock, John F., “The Great Wall of China: The World's Greatest Boundary  
Monument”, **FIG History Symposium**, (XXV FIG Congress  
2014, Kuala Lumpur, Malaysia.).
- 5/ Bruce, John Collingwood, **The Wall of Hadrian, With Especial Reference to  
Recent Discoveries – Two Lectures (1874)**,  
(Kessinger Publishing).
- 6/ Burton, Anthony, **Hadrian's Wall Path – Official National Trail Guide**,  
(Aurum Press Ltd., London, 2016).
- 7/ Campbell, Brian, **The Writings of the Roman Land Surveyors; Introduction,  
Text and Commentary**, (The Society for the Promotion of  
Roman Studies, London, 2000).
- 8/ Carter, Geoff, “Theoretical Structural Archaeology”, 40. Reverse engineering the  
Vallum (29 November, 2014).
- 9/ Collingwood, R. G. (MA, FSA), “The Purpose of the Roman Wall”,  
**The Vasculum, The North Country Quarterly of Science and  
Local History**, Vol. VIII No. 1 October, 1921).
- 10/ De La Bedoye, Guy, **Hadrian's Wall: History and Guide**, (Amberley, 2010).
- 11/ Dietrich, William, **Hadrian's Wall: A Novel**, (HarperTorch, NY, 2005).
- 12/ Dijokiene, Dalia, “The Impact of Historical Suburbs on the Structural Development  
of Cities (based on examples of European cities)”, Department of  
Urban Design, Vilnius Gediminas Technical University.
- 13/ Eliot, Paul, **Everyday Life of a Soldier on Hadrian's Wall**,  
(Fonthill Media, 2015).
- 14/ Fields, Nic, **Hadrian's Wall AD 122-410**,  
(Osprey Publishing Ltd., Oxford, UK, 2010).
- 15/ Fields, Nic, **Rome's Northern Frontier AD 70-235**,  
(Osprey Publishing Ltd., Oxford, UK, 2008).
- 16/ Frodsham, Paul, **Hadrian and His Wall**,  
(Northern Heritage Publishing, UK, 2013).
- 17/ Geldard, Ed, **Hadrian's Wall – Edge of an Empire**,  
(The Crowood Press Ltd., Wiltshire, 2011).
- 18/ Gonzale-Garcia, A.C. Rodriguez-Anton, A. and Belmonte, J.A.,  
“The Orientation of Roman Towns in Hispania: Preliminary Results”,  
**Mediterranean Archaeology and Archaeometry**,

---

HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017

Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29–June 2, 2017

Vol.14 No. 3 (2014), pp 107-119.

- 19/ Hill, Peter, **The Construction of Hadrian's Wall**, (Tempus Publishing Ltd., Great Britain, 2006).
- 20/ Jones, Clifford, **Hadrian's Wall: An Archaeological Walking Guide**, (The History Press UK, 2012)
- 21/ Mark, Joshua J., "Hadrian's Wall" (15 Nov., 2012.)  
– [www.ancient.eu/Hadrians\\_Wall/](http://www.ancient.eu/Hadrians_Wall/)
- 22/ Moorhead, Sam and Stuttard, David, **The Romans Who Shaped Britain**. (Thames & Hudson Ltd., London, 2012).
- 23/ Mothersole, Jessie, **Hadrian's Wall**, (Lightning Source UK Ltd.).
- 24/ Pham, Mylinh Van, "Hadrian's Wall: A Study in Function" (2014).  
Master's Thesis, Paper 4509, San Jose State University.
- 25/ Poulter, John, **Surveying Roman Military Landscapes Across Northern Britain: The Planning of Roman Dere Street, Hadrian's Wall and the Vallum, and the Antonine Wall in Scotland**, (Archaeopress and John Poulter, 2009).
- 26/ Richards, Mark, **Hadrian's Wall Path Map Booklet: 1:25,000 Route Mapping'** (Cicerone Press, 2015).
- 27/ Richards, Mark, **The Spirit of Hadrian's Wall**, (Cicerone, Cumbria, 2008).
- 28/ Shotter, David C.A., **The Roman Frontier in Britain: Hadrian's Wall, the Antonine Wall and Roman Policy in Scotland**, (Carnegie Pub., 1996).
- 29/ Simpson, Gerald, **The Turf Wall of Hadrian 1895-1935**, (Read Books, 2011).
- 30/ Southern, Patricia, **Hadrian's Wall: Everyday Life on a Roman Frontier**, (Amberley Pub., UK, 2016).
- 31/ UNESCO, "Frontiers of the Roman Empire WHS – Hadrian's Wall Management Plan 2008-14."
- 32/ Wilmott, Tony, **Hadrian's Wall – Archaeological Research by English Heritage 1976-2000**, (English Heritage, 2009).

On the net:

- 1/ Northumberland History – England's North East, Hadrian's Wall:  
[www.englandsnortheast.co.uk/HadriansWall.html](http://www.englandsnortheast.co.uk/HadriansWall.html)
- 2/ "The history of Hadrian's Wall" – (22/01/2017):  
[explore-hadrians-wall.com/history/](http://explore-hadrians-wall.com/history/)
- 3/ h2g2 – "A Short History of the Roman Legion from the Republic to the Imperial Era" (created Dec. 5, 2016).  
[h2g2.com/edited\\_entry/A87874096](http://h2g2.com/edited_entry/A87874096)

## BIOGRAPHY

Private land surveyor since 1973, **Bachelor of Surveying** (UNSW 1978), **MA** (Egyptology) from Macquarie Uni., Sydney (2000), **Registered Surveyor NSW** 1981. Now Director of Brock Surveys at Parramatta (near Sydney). Papers presented worldwide inc. Egypt, Germany, France, Hong Kong, Canada, Brunei, New Zealand, Greece, UK, USA, Israel, PNG, Sweden, Italy, Nigeria, Malaysia, Morocco and Bulgaria. Since 2002 regular column *Downunder Currents*, RICS magazine

---

HADRIAN'S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017

Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29–June 2, 2017

(London) *Geomatics World*. Stalwart of FIG Institution: History of Surveying & Measurement awarded **FIG Article of the Month March 2005** for: “Four Surveyors of the Gods: XVIII Dynasty of New Kingdom Egypt (c.1400 BC)”, **January 2012** – “Four Surveyors of Caesar: Mapping the World” & **June 2014** – “The Great Wall of China: The World’s Greatest Boundary Monument.” Institution of Surveyors NSW Awards – **Halloran Award 1996** for Contributions to Surveying History, **Fellow ISNSW 1990 & 2002 Professional Surveyor of the Year**. First international **Life Member** of the Surveyors Historical Society (USA), Rundle Foundation for Egyptian Archaeology & Parramatta Historical Society, **Foundation Member** Australian National Maritime Museum & Friends of National Museum of Australia. **Member** of Bradman Crest, International Map Collectors Society, Royal Australian Historical Society, Hills District Historical Society, Prospect Heritage Trust, Friend of Fossils (Canowindra), **Friends** of May’s Hill and St. John’s Cemeteries.

## CONTACTS

John Francis Brock  
P.O. Box 9159,  
HARRIS PARK NSW 2150, AUSTRALIA  
Tel: +61(0)414 910 898  
Email: [brocksurveys@bigpond.com](mailto:brocksurveys@bigpond.com)

---

HADRIAN’S WALL: Boundary Monument for the Northern Frontier of Roman Britannia! (9164)  
John Brock (Australia)

FIG Working Week 2017  
Surveying the world of tomorrow - From digitalisation to augmented reality  
Helsinki, Finland, May 29–June 2, 2017