

THE DISTANCE SLABS OF THE ANTONINE WALL: The Surveyors' Record Carved in Stone!

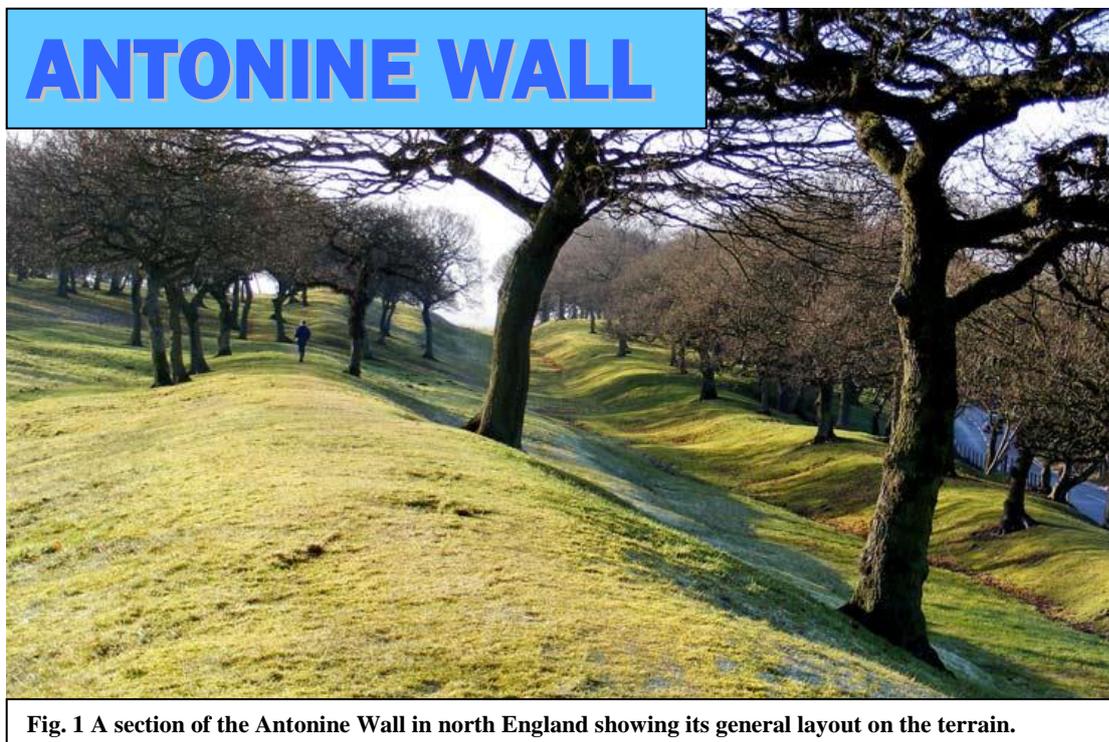
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Keywords: Emperor Antoninus Pius, Roman Britannia, The Wall, The Vallum, Roman Surveying, Surveyors Written Instructions (Corpus Agrimensorum, Romanum), Vallum Antonini, International Borders, Distance Slabs.

ABSTRACT



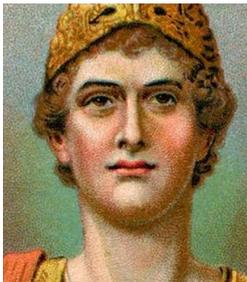
“There is nothing permanent except change.” – Heraclitus (535-475 BC)



It is uncanny what unknown amazing details of history I have discovered while researching other

sites and topics. This is exactly the case with regard to the fascinating collection of heirlooms unearthed along the Antonine Wall during hundreds of years of archaeological investigation of this little cousin of the more substantial and well known Hadrian's Wall erected earlier to the south. During various periods a continuous set of distance slabs have been dug up which accurately record on ornamental stone tablets precisely the lengths of segments of wall surveyed and built as well as naming the legion responsible for the construction of that portion. As soon as I read the words "distance" and "accurate" to me there could be only one group of the Roman legions who could have provided the data required to nominate the right length for these sections of the Wall – the mensors (surveyors) of the elite squad known as *the immunes*. Along the way I was also delighted to find out that one of my favourite Scottish surveyors, William Roy, had re-surveyed the remains of this ancient earthen rampart during 1755 before he became Surveyor-General in 1765.

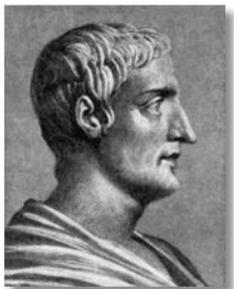
INTRODUCTION



"I am not afraid of an army of lions led by a sheep;
I am afraid of an army of sheep led by a lion."
- Alexander the Great (356-323 BC)

Although only representing the northern borderline of Rome's western colony of Britannia for a handful of years at around 20 from 138 AD to 158 AD the lesser known boundary (*limes*) built by Emperor Antoninus Pius could not negate the passionate aggression of the battle hardened highlanders. In the true traditions of the regulated Roman nation this new boundary line to supersede the more famous Wall of Hadrian was called *The Vallum Antonini* because that is exactly what it was – a continuous earth mound made up of turf squares with the adjoining trench to the North. Within the collection of writings of the Roman Land Surveyors (*Corpus Agrimensorum Romanum*) the specification to construct a boundary demarcation along a line separating Roman lands from those of a different inhabitant was called a *limes* which took the form of a *vallum* (literally "earthmound"). (see my paper "Hadrian's Wall: Boundary Monument for the Northern Frontier of Roman Britannia!" for more extensive background information on the evolution of the Vallum as the required form of demarcation of such an international boundary limit). Punctuated with timber forts and look out towers during its era of adoption the remains of this border marking was later surveyed again by famed Scottish surveyor William Roy in the middle 1700's, whose excellent work will also be covered in this paper.

WHY WAS THE ANTONINE WALL ERECTED?



"Great empires are not maintained by timidity." - Tacitus (58-117 AD)



Fig. 2 Roman Emperor Antoninus Pius

Born in Lanuvium, Latium in 86 AD with the name Titus Aurelius Fulvius Boionius Arrius Antoninus when this adopted son of Hadrian assumed control in 138 upon the death of his stepfather he concocted the bulky appellation Caesar Titus Aelius Hadrianus Antoninus Augustus later to have Pius added to this lengthy titulary after he had persuaded a reluctant Senate to deify his predecessor. Despite being tagged as one of the “Good Emperors” congeniality did not equate to acceptance as a Roman ruler so Antoninus Pius felt obligated to demonstrate to his peace ridden generals in the far off colonies that he would not tolerate insurgency by those

foreign clans he had wished to subjugate. What better way to invigorate morale amongst his battle hungry legions than to move his territorial front forward through incursions into hostile lands giving the troops some combat action as well as providing extensive capital works to install a new boundary demarcation for the new northernmost limit of his western colony. Unfortunately desire can often fall well short of the prevailing circumstances thus the fierce resistance of the northern highlanders presented a greater foe than had been anticipated resulting in the retreat of the regiments back behind the Wall erected by the predecessor of Antoninus Pius a mere twenty years after its establishment.

Despite this smoldering disquiet in the distant colonies the reign of the Five Good Emperors from 96 to 180 was remembered as a period of internal peace and prosperity thus receiving this accolade embellished in their description of goodwill.

WALL LOCATION: SURVEYING, DESIGN & CONSTRUCTION

“As we know from the Roman empire, big empires go down if the borders are not well protected.” – Mark Rutte, Dutch politician



Fig. 3 Typical view of the design of the Antonine Wall showing the rampart, berm and ditch as it crosses the countryside.

If the name pre-assigned to the new territory limit as *Vallum Antonini* was not proof enough that the delineation of this new boundary 100 miles (160 kms) further to the north was to be a Vallum then the final construction certainly

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demonstrated it beyond doubt. The relocated territory limit was installed as a Vallum i.e. earth mound with a trench adjoining to the North.

The rampart-mound was made up of turf bricks placed upon a foundation of stones laid down for more solid support with a wall height of 9-10 feet (2.7-3 m) with a V-shaped ditch on the northern side varying in depth from 6-13 feet (2-4 m) at a width between 20-40 feet (6 and 12 metres) divided by a berm at from 30-40 feet (9-12 m).. Excess earth from the ditch was placed along the northern lip of the ditch exaggerating the depth. Timber watch towers and bastions were erected on top of the rampart-mound. At various positions forts were constructed to house the regiments from where they could prepare for combat when required. As was the case with Hadrian's Wall the same three legions responsible for this prior project were also the builders of the earthen Wall of Antoninus, they being II Augustus, VI Victrix and XX Valeria Victrix.

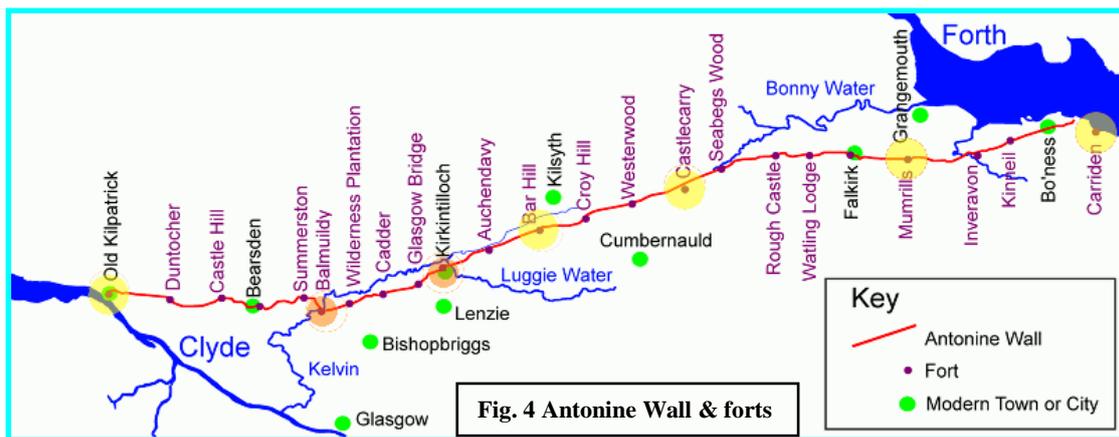


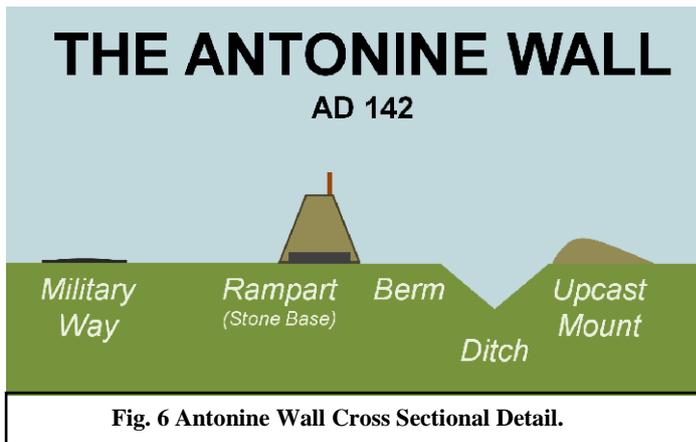
Fig. 4 Antonine Wall & forts

With a pre-existing presence for many years past the limits of Hadrian's Wall as well as forays further north to test the climate of hostility and formidability of the occupying tribes the short span between the Firth of Forth and Firth of Clyde would have been well known to the Roman planners. With a total distance of 37.6 Roman miles (36.5 miles – 58.4 kms) the proposed construction length was less than half of the more southern frontier limit which spanned 80 Roman miles (77.6 miles - 124 kms). Therefore the completion time would have been much more rapid and without including any grandiose stone wall to be placed the overall time to finish placing this new territory demarcation was achieved much more expediently than its counterpart, said to be 2-5 years from between 138-143 AD. With the ramparts, watchtowers and forts erected using timber being faster to complete they presented a less fire resistant target for any marauding tribes of assailants. One feature was certain in the scheme being the Vallum – the continuous mound of earth with its adjoining trench – thus complying strictly with the directions furnished to the Roman military surveyors to construct such a Vallum along the new territory limit dividing this extended Roman occupation to the south



Fig. 5 Antoninus Pius coin (138-161 AD) for Komama in Pisidia showing the monarch ploughing the first furrow like his antecedents Augustus and Hadrian.

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from the foreign lands to north (a translation of the 5th century notes *Corpus Agrimensorum Romanum* by Brian Campbell in the year 2000 provides this instruction – see Bibliography number 5/). Having rebadged himself by adding “Hadrianus and Augustus” onto his extended title it is not surprising that this new leader was to fervently incorporate the traditional historic elements in the placement of his

new territorial line demarcation. Along with his idol Augustus and mentor Hadrian he was not going to be one to miss the occasion of having himself depicted on the reverse of a coin ploughing the *sulcus primigenius* just as his two forerunners had done before him. (see my paper on Hadrian’s Wall). Among all other interlocutory features which tie these three heads of Rome together it appears to me that this one simple depiction of each of themselves on a coin over two hundred years apart partaking in this traditional ancient ritual of ploughing the first furrow just like Romulus had done at the birth of Rome more than any other tangible link clearly exhibits the proud sense of heritage and recognition of history which was a foremost trait in their characters.

The remains of this Roman earth rampart run across central Scotland from Old Kilpatrick in the west to Bo’ness in the east running through the land of five modern day local authorities being East Dunbartonshire, Falkirk, Glasgow, North Lanarkshire and West Dunbartonshire. Since 2008 it has been registered on the UNESCO World Heritage List and many museums, walking paths and sites for inspection of the existing vestiges of the Roman presence are available for all interested visitors.

DISTANCE SLABS OF THE WALL



“Every new beginning comes from some other beginning’s end.”

- Marcus Annaeus Seneca (54 BC-39 AD)

As a testimony to their hard work and achievements each Legion decided to carve memorials in stone now referred to as distance slabs which listed their Emperor along with their own name followed by the accurate length of the section of the Wall for which they had been



Fig. 7 Distance Slab No. 16 from Old Kilpatrick.

responsible. It is theorised that there may have been four such memorials for each section of wall consisting of fifteen (15) sections in all separately acknowledged by its respective building legion being two at each end of the section on opposite sides of the structure probably fastened to the fabric of the nearest timber member of the walls features. This postulation is supported by the number of slabs which appear to memorialise the same portion of the overall construction in the westernmost part of the overall construction. To date twenty (20) such stone slabs have been recovered from what it is surmised there may have been forty (40) or possibility sixty (60) under another likely

scenario. Should the former model turn out to be an accurate assessment of the likely total number of distance slabs this 50 % recovery of the hoard is a remarkable portion of the full corpus of carvings seeing that most remains in areas of former Roman occupation have only yielded from 1-5 per cent of a complete subscription of inscribed artefacts. The largest amount of recovered stone inscriptions from expected estimates previous to this amazing rate of rediscovery along the Antonine Wall was a 6.5 % yield along Hadrian's Wall so this volume of material is the most amazing ever collected. It gives us a brilliant set of commemorative tablets to the work carried out by the nominated legions as well as the cumulative total of construction lengths achieved.

Therefore this far greater average of salvaged items is by far the most unique amount of a Roman stocktake ever uncovered to provide a solid reflection of the pride which the Roman legions held in their achievements on behalf of their empire along with the culture of monumentation which has been able to allow us this personal insight into the bonded regimentalism existing within the great army with particular emphasis on its section of immunes which included the Surveyors. Having been erected by the same three Roman legions who were responsible for the monumental Hadrian's Wall project some of the distance slabs bore the symbols of the relevant regiment who had carried out the designated part of the building which were a boar for the XX Victorious Valerian Legion and Capricorn (half-goat/half-fish) or Pegasus (the flying horse) for the II Augustan Legion.

Each distance slab follows a relatively standard pattern starting with the Emperor's name followed by the name of the Legion responsible for the portion of wall erection for which the accurate length is quoted in either Roman feet (for the shorter sections) or paces and Roman feet for those parts of greater expanse. Two of the recovered stone tablets, being Numbers 11 and 14 as can be seen in Appendix B in this work, also add the words "*Opus Valli*" which is quoted by Keppie in his excellent collation of all of the inscribed Roman stonework along the

Antonine Wall to be “the works of the rampart-mound”, going on further to suggest that it is simpler to include all of the features of the wall design as being inclusive within this phrase. My input to this interpretation is that “*Opus Valli*” literally means the work of building the Vallum with all of the extraneous inclusions of timber additions being supplementary to the principal feature of the earthen mound along with the ditch. Clearly the resultant ditch (up to 5 metres – 17 Imp. feet deep) in front of the earth mound served as a further obstacle to raiding parties whose progress had to be reduced when faced with crossing such an impediment. As I have previously stated in my paper on Hadrian’s Wall just as many international border lines have an identifiable width containing a clear zone of no man’s land this first century forerunner for such a line of division was also made up of a set of defining features all of which made up the separation between Rome and its independent neighbours. The total spread of the Antonine Wall from Old Kilpatrick to Bo’ness (Borrowstounness) has been measured to be 39,726 Roman paces or 36 miles 620 yards in Imperial distance. It was reported to have been of turf taken from local pastures with gravel from the adjacent ditch being placed upon a bed of stones quarried locally. Capitolinus, who was the author nearest to the date of commemoration of the wall, told us that the rampart was of turf, and that it was a fresh one: “*Britannus – vicit, alto muro cespiticio – ducto.*” (Anton. Pius.5.)

The full recitation of Julius Capitolinus is translated to be: “He (Antoninus Pius) conquered the Britons through his legate Lollius Urbicus, another wall of turf being built after the barbarians had been driven back ...”, *Life of Antoninus Pius* (V.iv) translated by Anthony Birley. This contemporary citation gives us an indicator of when the wall was erected because Urbicus as the Roman legate in Britannia appointed in 139 AD served as Governor until 142 AD. He quelled an uprising by the Brigantes around 140 AD, this victory being commemorated on a series of Roman coins (possibly dating to 141-143 AD) which bore the standing figure of Britannia on the reverse, the personification of this province, as well as the acclamation of Antoninus as *Imperator* being the only time he was ever recognized with this honour. Seeing as the distance slabs were also emblazoned with this designation of the Emperor as *Imperator* it is a reasonable proposition to estimate that this wall was constructed from 139-140 to 142-143 AD.

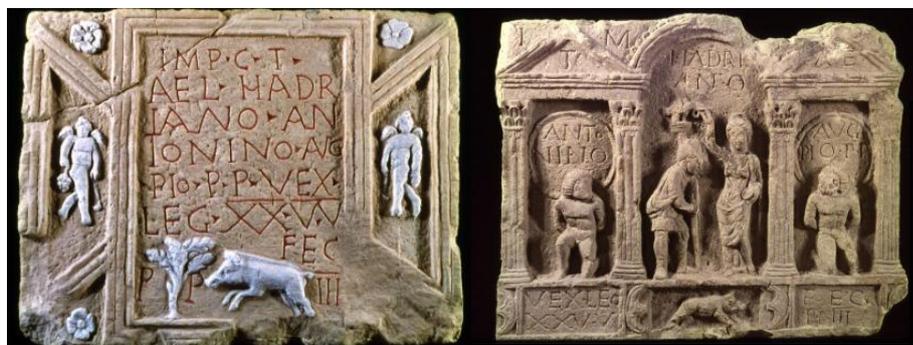


Fig. 8 Distance Slabs 8 and 9 respectively by Legion XX Valeria Victrix both attributed to the same Eastern end of the wall section at Hutcheson Hill each claiming a distance of 3000 feet.

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RETREAT TO THE WALL OF HADRIAN

“Britannia’s big enough to count,
but remote enough not to matter.”
- Ruth Downie, “Medicus”



What was developing as a continual burden on the Roman military machine was being considered as too distant to control with a depletion of troop numbers caused by the recall of some of the legions to other parts of the empire closer to home also under siege from outside armies of frenzied barbarians.

Therefore without the likelihood of any reinforcements to support the Britannic frontier the next successor of the newest leader after Antoninus, Marcus Aurelius, upon his death had little option than to drag his forces back behind the more substantial and robust stone barrier of his predecessor after only 20 years activity in the northern regions. This first sign of



Fig. 9 Map showing Hadrian’s Wall and the Antonine Wall in 150 AD.

admission that the subjugation of the northern tribes of Caledonia was unachievable brought with it cracks opening up in the Roman vision for undiluted occupation of these western lands with the determination of the Scots not waning but noticeably buoyed by this weak capitulation after such an embarrassingly brief time period. Although the final desertion from these distant lands would not eventuate until early in the fifth century (411 AD) the writings were already carved in stone for this ultimate fall of the Roman Empire at least from its furthest colony in the west. With much less fire resistant building material used in the construction along the Antonine Wall in addition to its fleeting presence within the disputed territories there has not been similar recycleable scavenging of what remained throughout the lesser wall. Hence without a comparable frenzy of salvage activities along this corridor the more solid artifacts left behind have survived in greater quantities in a better state.

WILLIAM ROY'S RE-SURVEY OF THE ANTONINE WALL VESTIGES.

Described as “the finest map in the *Military Antiquities ...*” this map was of the entire Antonine Wall together with detail plans of the individual forts along this border line structure. Carried out by the iconic Scotsman William Roy it was completed in 1755 calling this construction “Grime’s Dyke” or “Graham’s Dyke” after Robert Graham who was alleged to have overrun it in about 500 AD. However the actual retreat back to Hadrian’s Wall is attributed to a northern uprising in 158 AD which brought the Antonine occupation to an abrupt end relegating it backwards behind its former limit south of Hadrian’s Wall. Although it appears that a quick retreat would have been desirable evidence indicates that the complete withdrawal from the Antonine Wall took place gradually up to 161 AD when the evacuation became absolute.

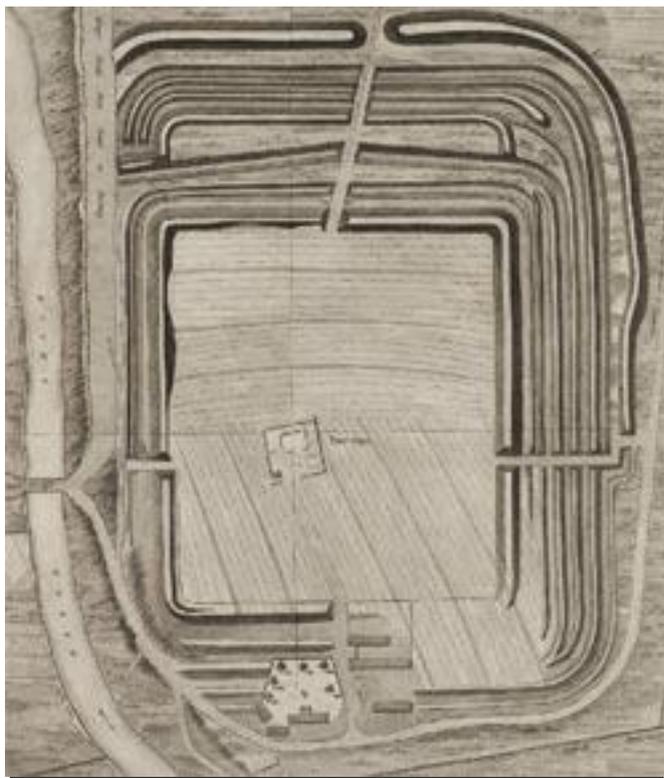


Fig. 10 Detail of Ardoch fort by Roy.

The first recorded rediscovery of artifacts from the Antonine Wall came on 12 April 1565 when Queen Mary sent correspondence concerning a recently found inscribed stone altar from Inveresk at Midlothian (*RIB* 2132). In George Buchanan’s 1582 edition of *Rerum Scotticarum Historia* he makes mention of inscribed walls relevant to the Antonine Wall then the landmark publication of *Britannia* in Latin by William Camden in 1585 became the dominant authority on Roman epigraphy with the 1607 version recording five inscribed stones, in 1695 there were seven while in 1789 the number had swelled to 30. Now the Hunterian Museum at Glasgow University holds the single largest collection of Roman etched stones certainly possessing 17 of the twenty (20) rediscovered distance slabs.

Roy was a career military surveyor performing his Military Survey of Scotland from 1747 to 1755. Subsequently he founded what would become the Ordnance Survey of Great Britain after he had been appointed Surveyor-General in 1765 also having a lifelong interest in Roman antiquities often revisiting many of the Roman sites in Scotland when off duty. He was active during a period of great resurgence in the discovery of artifacts along with general and professional curiosity in the history of Roman occupation and activity in Britain. Thus his professional endeavours were not only driven by the academic demands for accurate maps

of what remained of the Roman presence in his land but also by his own personal obsession

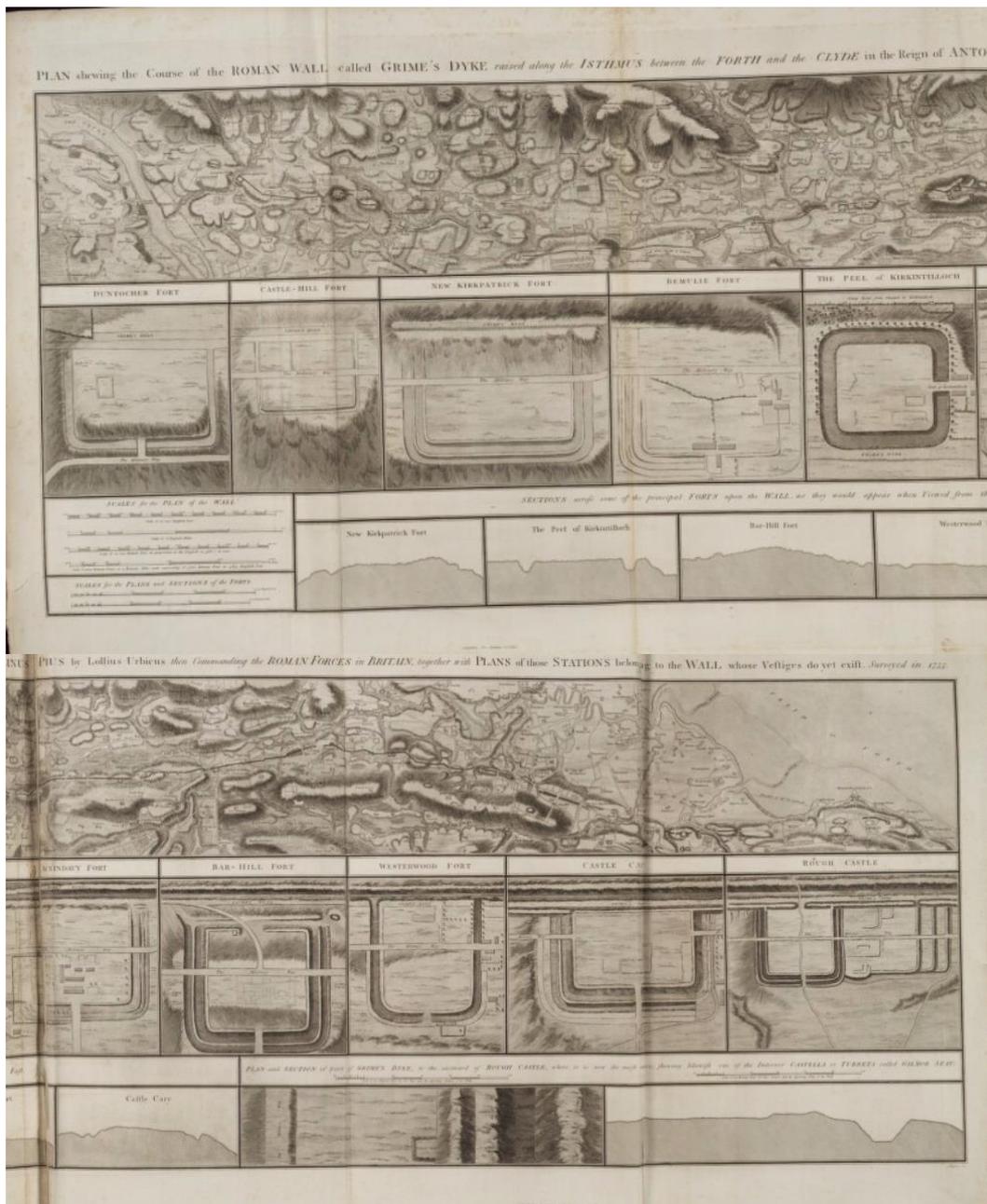


Fig. 11 Sketch of Arthur's O'on by Roy.

with this era in his country's evolution. His surveying and mapping was to encompass the whole of Scotland and some of the northern areas of England amongst which the Romans had inhabited. Part of his collection of charts included a map of all the sites known to him which was the only one published during his lifetime in 1773. The remainder of his work was issued posthumously in 1793 which contained his plan of the entire length of the Antonine Wall with adjoining forts and Roman stations such as those at Rough Castle, Auchendavy, Ardoch, Camelon, Eldon Hills, Brown

Cather-Thun, Castle Dykes, Chew Green, Cleghorn and Inch-Stuthill. The work also contained sketches of some features like Arthur's O'on and Duntocher Bridge together with long and cross sectional diagrams of certain areas he had mapped. To appreciate the major contribution of Roy to the archival record of the Antonine Wall combined with its log of many sites which have either disappeared through the effects of weather or have even been destroyed by acts of wanton carelessness since the time of his collation of these most accurate and thorough details of a world lost in oblivion to mankind. Construction of the Forth/Clyde Canal which was opened in 1790 to provide for water bound vessels to travel along these low lying lands of Scotland caused considerable destruction to the remaining traces of the Roman wall occupations to further accentuate the invaluable work done by Roy in charting these areas of heritage for the referral of future generations as well as having an accurate record of all of those sites which no longer exist after the completion of this major public works project. The fact that this man was a great surveyor AND Scottish just adds to my personal admiration of another individual who obviously treasured the vestiges left behind from an ancient period of glamour, warfare and extravagance but more importantly eminent for the great value placed by the Romans upon their Surveyors both legionary and in the areas of private and public land creation and adjudication.

WILLIAM ROY'S BRILLIANT MAP OF THE ANTONINE WALL



Figs. 12 & 13 William Roy's Map of the Entire Antonine Wall published posthumously in 1793 as "Military Antiquities of the Romans in North Britain."

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THE HUNTERIAN MUSEUM

The Hunterian Museum within the University of Glasgow was opened in 1807 now being Scotland's oldest public museum. Containing the largest collection of inscribed Roman stonework anywhere in the world it boasts 17 of the original distance slabs with also two



Fig. 14 Map showing Vallum Antonini and Vallum Hadriani along with the Roman names for England (Britannia), Scotland (Caledonia) and Ireland (Hibernia).

plaster casts of the remaining slabs held at two other institutions. Up until very recently (2 months ago in fact) all of the full collection of these artifacts were on display within a gallery called "The Antonine Wall: Rome's Final Frontier" but the premises are currently closed for around two years for refurbishment action. Only closing on the day after I had just concluded my reconnoiter to the closest verges of occupation near Hadrian's Wall itself near the town of Wall (almost completely built from stones rummaged from the enormous supply of material from the lengthy edifice as my strong disappointment loomed large that I would not be able to inspect this collection of legendary stone iconography by the famed Roman legionary surveyors for at least two more years when the make-over is scheduled for completion.

The Antonine Wall may not be as substantial or as lengthy as Hadrian's Wall but it does evoke intense feelings of passion amongst the highlanders of the former Caledonia as the vestiges of this boundary monument as **entirely contained within Scotland** unlike the latter construction which wholly situated now within English sovereign soil. Thus the Scottish are fiercely protective of this Roman signature of presence within their territory which only represented a mere 20 odd years before the fanatical patriotism of the upper tribes dealt out a humiliating repulsion against the might of the Roman legions. At least the surveyors left us some inscribed stone treasures as a demonstration of pride in their work and testimony of their skills.

ROMAN SURVEYORS RULE – AGAIN!



“Rome has grown since its humble beginnings
that it is now overwhelmed by its greatness.”

– Titus Livius (59 BC- 17 AD)

It is a scenario repeated time after time throughout history that civilisations grow too large and amorphous resulting in their administrations being stretched too thin on the land and over-governed to a level of dysfunctionality ultimately leading to their implosion providing a soft target prime to be readily overrun by a stronger less burdened opponent just lingering in wait for the ponderous giant to topple.

Despite the progressive decline of its culture there is no doubt that the Roman surveyors maintained an elevated status in society and their work was continuously utilised in the affairs of the government and community settlement. However as soon as the words “distance” and “accurate” are uttered I immediately seize another opportunity to assure all who will listen that there can be but only one recognition which can come to mind which obviously is Surveyors! Roman surveyors are among those many eminent individuals throughout history who emulate the qualities, traditions and skills with which surveyors from all over the world can be identified. Men of undoubted ability, congeniality and technical excellence it is fully understandable just how highly esteemed these men of judgment and adjudication had become. Enriching the status already attained by the land surveyors of Rome during the mightiest era of the imperious nation it is not surprising that I am compelled to once again cite the erudite and astute Roman official Cassiodorus who referred to the agrimensore (land surveyor) in the following way:

“He walks not as other men walk!”

As I continue to direct readers of this paper to see the entire quotation of this very wise and eloquent man please look up my previous paper “Four Surveyors of Caesar: Mapping the World” to get a full appreciation for just how well regarded Roman surveyors as well as the awe with which their activities were held in Roman society. An allusion to the surveyor as some sort of madman rummaging amongst the thickets for evidence of marks of boundary marking or occupation by the residents seems to cast a mysterious and even somewhat mystical apparition of our Roman predecessors rather akin to the times of our country training when our master surveyor would find ancient marks in rarely visited bushland or the last traces of boundary trenches or remains of pegs after scratching the surface of similar ground.

CONCLUSION

Despite its lesser historical profile than its more formidable southern icon Hadrian's Wall the Antonine Wall is still significant from a Surveyor's perspective due to the unparalleled production of this magnificent series of distance slabs to once again demonstrate in stone just how skilled the Roman surveyors were. The other most noteworthy feature of this earthen construction was as an even clearer demonstration that its principal function was as a boundary demarcation monument which designated the limit of the territory for which Rome



Figs. 15 & 16 Busts of Emperors Antoninus Pius and Hadrian.

claimed jurisdiction and control 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 (known as *The Pomerium* in its context as the outer perimeter of the Eternal City) which included such a first furrow or trench adjoining the earthen mound known as the Vallum being the actual boundary of the *limes* or International Border Line of the Roman Colony Britannia. In a final note concerning the construction of the Antonine Wall it is most interesting that the same three Roman Legions responsible for the monumental project of erecting Hadrian's Wall were also entrusted with the task of making this less imposing border protection line along Rome's northernmost territorial limit deep within Caledonia – Second Augustan Legion (Legio II Augusta), Sixth Legion (Legio VI Victrix) and Twentieth Legion (Legio XX Valeria Victrix).

DEDICATION AND APPRECIATION

May I take this opportunity to dedicate this paper and presentation to my favourite Roman Emperor Hadrian with whom I have developed an appreciated affinity and admiration for his style, affiliation with tradition and history along with an obvious warm association with his excellent corpus of Roman legionary surveyors.

APPENDIX A

List of Roman Emperors during the Period from The Five Good Emperors to the abandonment of the Antonine Wall in 163 AD (also covering the Antonine Dynasty).

<u>The Five Good Emperors</u>	<u>96 – 180 AD</u>
Nerva	96 – 98 AD
Trajan	98 -117 AD
Hadrian	117 – 138 AD
Antoninus Pius	138 – 161 AD
Marcus Aurelius	161 – 180 AD
<u>Antonine Dynasty</u>	<u>138 – 193 AD</u>
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

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

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

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Author's note: When Gary Reed took us on a personal tour of parts of Hadrian's Wall his career in the marines gave him a first hand knowledge of regimental behaviour and training such that his explanation as to how the pacing of Roman soldiers could be so reliable was a total revelation to me and those who have thought just how the paces of different sized human beings could be so accurately determined. He said that it does not matter how tall or short the marching soldiers are they never get out of time or left behind the others when making their paces to the level of a dependable and repeatable step length which could be transferred into their reconnaissance of proposed locations for various features or for just a reliable estimate for the amount of building materials which would be required for any future project such as the erection of a boundary wall along with the various turrets, fortlets and major forts to be placed.

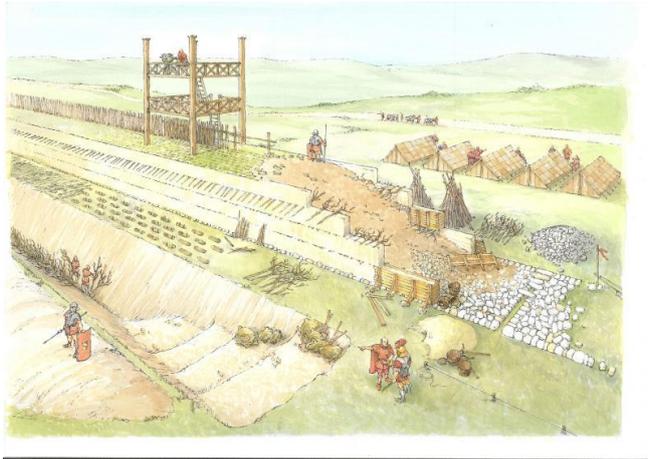


Fig. 17 Artist's impression of the timber structures on the Antonine Wall.

Fig. 18 Recreation of the timber watchtower and wooden bastion on the Antonine Wall at Vindolanda along Hadrian's Wall.



APPENDIX C

Distance Slabs recovered from the excavations along the Antonine Wall.

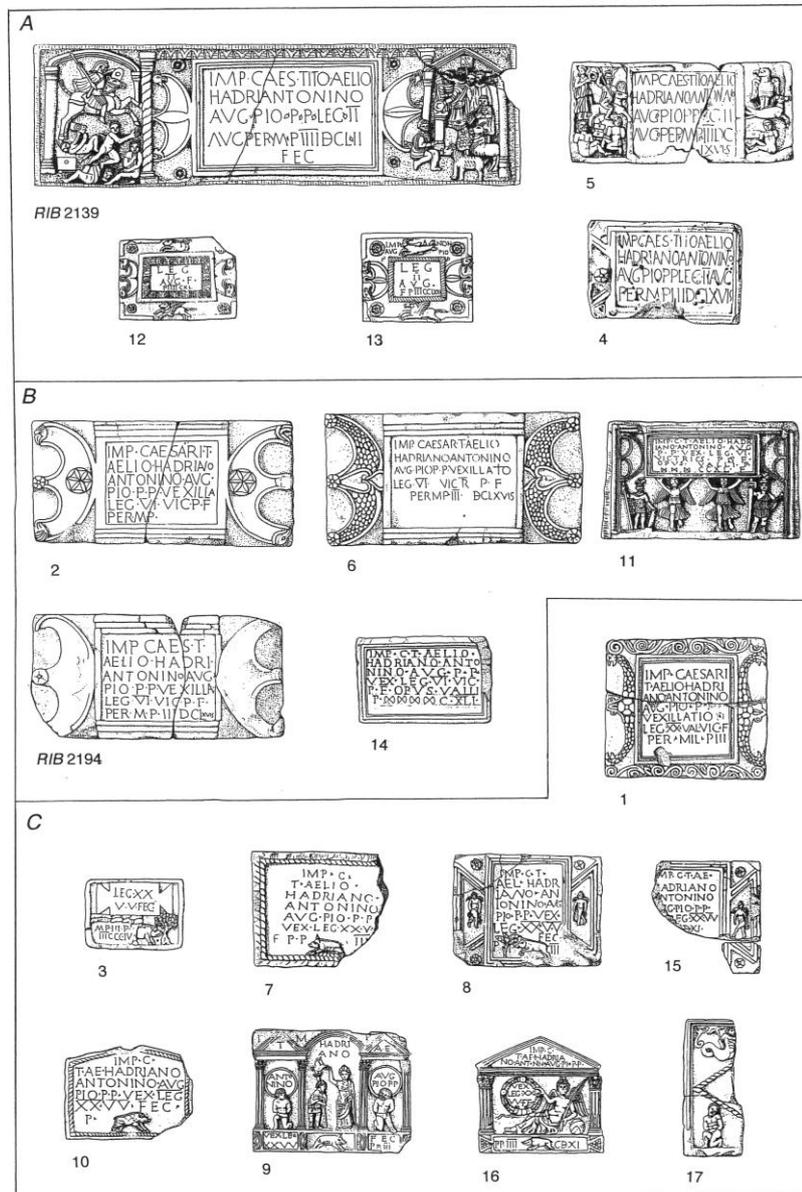


FIG. 23. The distance slabs, according to legion responsible. A = Second Legion; B = Sixth Legion; C = Twentieth Legion. Drawings by Margaret Scott. All are in the Hunterian collection, except the slabs from Bridgeness (RIB 2139), now in the National Museums of Scotland, Edinburgh, and from Millichen near Summerston (RIB 2194), now in Glasgow Art Gallery & Museum, Kelvingrove. All at scale 1:30.

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Fig. 19

Fig. 20 Distance Slab No. 1 from unknown place starting with the acclamation of “IMP” which means Emperor. This addition to the Emperor’s titulary is only used for a brief period at the start of the reign of Antoninus Pius.

Size of stone: H. 0.87 m;
 W. 0.97 m; D. 0.105 m
 Material – Buff sandstone
 Inscription: *Imp(eratori) Caesari / T(ito) Aelio/ Hadri/ ano Antonino/ Aug(usto) Pio p(atri) p(atriciae)/ vexillatio/ Leg(ionis) XX Val(eriae) Vic(tricis) f(ecit)/ per mil(lia) p(assuum) III.* “For the emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his Country, a detachment of the Twentieth Valiant Victorious Legion

built (this) over a distance of 3000 paces”.

Stone size:
 H. 0.77 m W. 1.59 m
 D. 0.165 m
 Material – Gritty buff sandstone
 Inscription: *Imp(eratori) Caesari T(ito)/ Aelio Hadriano/ Antonino Aug(usto)/ Pio p(atri) p(atriciae) vexilla(tio)/ Leg(ionis) VI Vic(tricis) p(iae) f(idelis)/ per m(illia) p(assuum)* “For the emperor Caesar Titus Aelius Hadrianus Antoninus



Fig. 21 Distance Slab No. 2 from Eastermains, Kirkintilloch, Dunbartonshire. IMP is seen as for DS No. 1

Augustus Pius, Father of his Country, a detachment of the Twentieth Valiant and Victorious Legion built (this) over a distance of ---- paces”. Note the nominated length is absent so it may have been buried in a time of hasty withdrawal.

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Fig. 22 Distance Slab No. 3 from Eastermains, Kirkintilloch.

Size of stone:
 H.0.44m;W.0.59
 m; D.0.38m
 Material – Buff
 sandstone
 Inscription:
*Leg(ionis) XX/
 V(aleriae)
 V(ictrix) fec(it)/
 m(illia)
 p(assuum) III
 p(edum)/
 IIICCCIV.* “The
 Twentieth Valiant
 and Victorious
 Legion built
 3,000 paces,
 3,304 feet”.

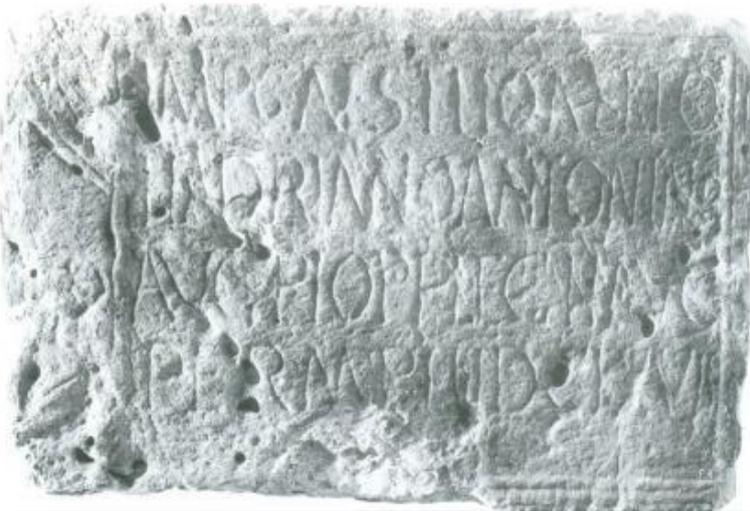


Fig. 23 Distance Slab No. 4 from Cawder, Bishopbriggs, Glasgow.

Size of stone: H. 0.63 m
 W. 0.93 m; D. 0.175 m
 Material – Buff
 sandstone
 Inscription:
*Imp(eratori) Caes(ari) Tito
 Aelio/ Hadriano Antonino/
 Aug(usto) Pio p(atri) p(atriciae)/
 Leg(ionis) II Aug(usta)/ per
 m(illia) p(assuum) IIIDCLXVIS.*
 “For the emperor Caesar Titus
 Aelius Hadrianus Antoninus
 Augustus Pius, Father of his
 Country, the Second Augustan
 Legion (built this) over a
 distance of 3,666 ¹/₂ paces”.



Fig. 24 Distance Slab No. 5 from Summerston, Glasgow.

Size of stone:
 H. 0.6 m;
 W. 1.34 m;
 D. 0.14 m
 Material –
 Buff sandstone

Inscription *Imp(eratori) Caes(ari) Tito Aelio/ Hadriano Antonino/ Aug(usto)/ Pio p(atri) p(atriciae) vexilla(tio)/*

Leg(ionis) II/ Aug(usta) pep(?) m(illia) p(assuum) IIIDC/ LXVIS .“For the emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his Country, the Second Augustan Legion built (this) over a distance of 3,666 $\frac{1}{2}$ paces”.



Fig. 25 Distance Slab No. 6 from Castlehill, Dunbartonshire.

Size of stone:
 H. 0.76 m;
 W. 1.49 m;
 D. 0.18 m
 Material – Gritty
 buff sandstone

Inscription: *Imp(eratori) Caesar(i) T(ito) Aelio/*

Hadriano Antonino/ Aug(usto) Pio p(atri) p(atriciae) vexillatio/ Leg(ionis) VI Victr(ix) p(iae) f(idelis)/ per m(illia) p(assuum) IIIDCLXVIS .“For the emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his Country, the Sixth Victorious Loyal and Faithful Legion built (this) over a distance of 3,666 $\frac{1}{2}$ paces”.



Fig. 26 Distance Slab No. 7 from Castlehill, Dunbartonshire.

Size of stone:
 H. 0.72 m; W. 0.82 m;
 D. 0.13 m
 Material –
 Buff sandstone
 Inscription: *Imp(eratori) C(aesari) T(ito) Aelio/ Hadriano/ Antonino/ Aug(usto) Pio p(atri) p(atriae) vex(illatio) Leg(ionis) XX V(aleriae) [V(icitris)]/ fecit p(er) p(edum) III.* “For the emperor

Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his Country, a detachment of the Twentieth Valiant and Victorious Legion built (this) over distance of 3000 feet”.



Fig. 27 Distance Slab No. 8 from Hutcheson Hill, Dunbartonshire.

Stone size: H. 0.67m; W. 0.85m; D. 0.12m
 Material –

Local yellowish buff sandstone. Inscription: *Imp(eratori) C(aesari) T(ito) Ael(io) Hadr(iano) An(tonino) Aug(usto) Pio p(atri) p(atriae) vex(illatio) Leg(ionis) XX V(aleriae) V(icitricis) fec(it) p(er) p(edum) III.* “For the emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his Country, the Twentieth Valiant and Victorious Legion completed (the work) over a distance of 3,000 feet”.



Fig. 28 Distance Slab No. 9 from Hutcheson Hill, Bearsden, Dunbartonshire.

Size of stone:
 H. 0.72 m; W. 0.82 m;
 D. 0.13 m
 Material – Yellowish Buff sandstone
 Inscription: *Imp(eratori) C(aesari) T(ito) Ael(io) Hadri(ano) Anto(nino) Aug(usto) Pio p(atri) p(atriciae) vex(illatio) Leg(ionis) XX V(aleriae) V(ictricis) fec(it) p(er)*

p(edum) III. “For the emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his Country, the Twentieth Valiant and Victorious Legion built (this) over a distance of 3,000 feet”.

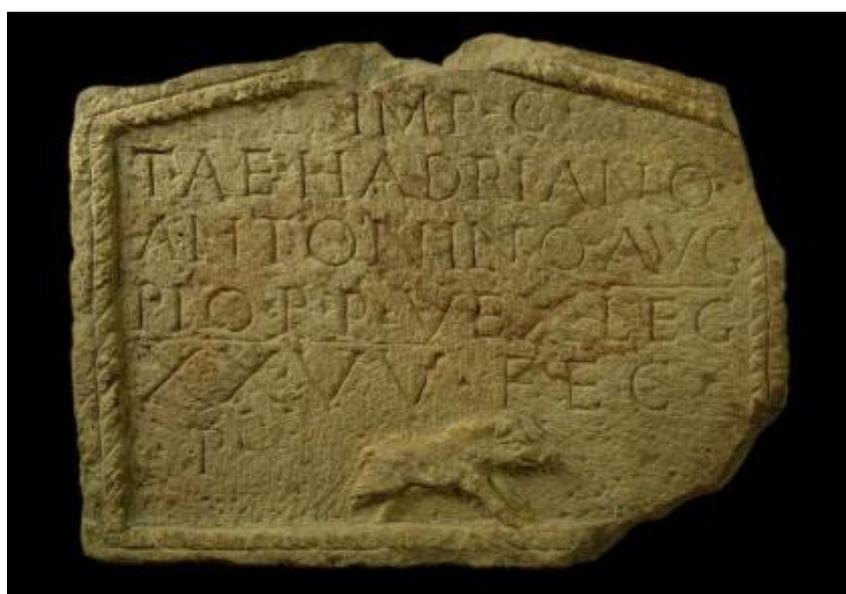


Fig. 29 Distance Slab No. 10 provenance unknown.

Size of stone:
 H. 0.57 m;
 W. 0.77 m;
 D. 0.12 m
 Material – Buff sandstone

Inscription: *Imp(eratori) C(aesari) T(ito) Ae(lio) Hadri(ano) Antonino Aug(usto) Pio p(atri) p(atriciae) vex(illatio)*

Leg(ionis) XX V(aleriae) V(ictricis) fec(it) p(edum). “For the emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his Country, the Twentieth Valiant and Victorious Legion built (this) over a distance of ...”.



Fig. 30 Distance Slab No. 11 from Braidfield, Duntocher, Dunbartonshire.

Size of stone:
H. 0.765 m; W. 1.19 m;
D. 0.17 m

Material – Whitish buff sandstone

Inscription: *Imp(eratori) C(aesari) T(ito) Aelio Hadr(iano) Antonino Aug(usto) p(atrici) p(atriciae)*

vex(illation) Leg(ionis) VI/ Victric<i>s) p(iae) f(idelis)/ opus valli p(edum)/ MMM CCXL fecit. “For the emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his Country, a detachment of the Sixth Victorious Loyal and Faithful Legion built the work of the wall (**vallum by me**) over a distance of 3,240 feet”.

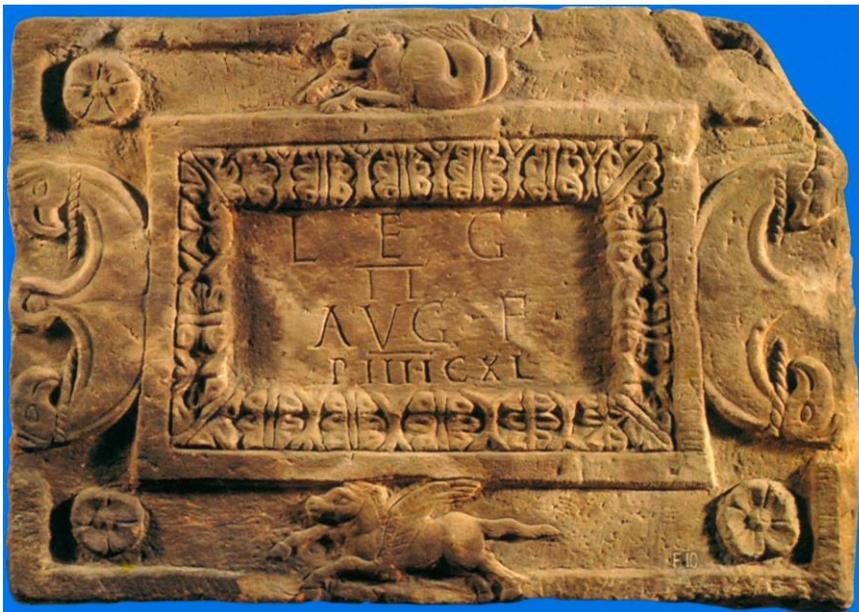


Fig. 31 Distance Slab No. 12 from Duntocher, Dunbartonshire.

Size of stone:
H. 0.5 m; W. 0.73 m;
D. 0.19 m

Material – Buff sandstone

Inscription: *Leg(ionis) II/ Aug(usta) fec(it)/ p(edum) IIII CXL.* “The Second Augustan Legion built 4,140 feet”.



Fig. 32 Distance Slab No. 13 from Carleith, Dunbartonshire.

Size of stone:
 H. 0.55 m; W. 0.68 m;
 D. 0.16 m
 Material –
 Buff sandstone
 Inscription: *Imp(eratori) Antonino/ Aug(usto) Pio/ p(atri) p(atriciae)/ Leg(ionis)/ II/ Aug(usta)/ fec(it)/ p(edum) IIICCLXXI.* “For the emperor Antoninus Augustus Pius, Father of

his Country, The Second Augustan Legion built 3,271 feet”.



Fig. 33 Distance Slab No. 14 from Old Kilpatrick, Dunbartonshire.

Size of stone:
 H. 0.53 m; W. 0.83 m;
 D. 0.18 m
 Material –
 Greyish sandstone
 Inscription: *Imp(eratori) C(aesari) T(ito) Aelio/ Hadriano Anto/ nino Aug(usto) p(atri)*

p(atriciae)/ vex(illatio) Leg(ionis) VI Vic(tricis)/ p(iae) f(idelis) opus valli/ p(edum)/ MMMMC XLI fecit. “For the emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his Country, a detachment of the Sixth Victorious, Loyal and Faithful Legion (built) the work of the wall (**vallum by me**) over a distance of 4,141 feet”.



Fig. 34 Distance Slab No. 15 from Old Kilpatrick, Dunbartonshire.

Size of stone (fragment only):

H. 0.66 m; W. 0.62 m; D. 0.1 m

Material – Yellowish buff sandstone.

Inscription: [I]mp(eratori) C(aesari) T(ito) Ae(lio)/ [H]adriano/ [A]ntonino/ [A]ug(usto) Pio p(atri) p(atriciae)/ [vex(illatio) L]eg(ionis)/ XX V(aleriae) V(ictricis)/ [p(er) p(edum) III C]DXI/ [fec(it)]. “For the emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, father of his Country, a detachment of the Twentieth Valiant and Victorious Legion built (this) over a distance of 4,411 feet”.



Fig. 35 Distance Slab No. 16 from Old Kilpatrick, Dunbartonshire.

Size of stone: H. 0.69 m; W. 0.73 m; D. 0.12 m

Material – Buff sandstone

Inscription: Imp(eratori) C(aesari)/ T(ito) Ae(lio) Hadria/ no Antonino Aug(usto) Pio p(atri) p(atriciae)/ vexilla(tio)/ Leg(ionis) XX V(aleriae) V(ictricis) fec(it)/ p(er) p(edum) IIIICDXI. “For the emperor Caesar Titus Aelius Hadrianus Antoninus Augustus Pius, Father of his Country, a detachment of the Twentieth Valiant and Victorious Legion built (this) over a distance of 4,411 feet”.

Note: All information relating to the details of the distance slabs from the Hunterian Museum inclusive of location of find, stone size and type combined with the interpreted full Latin text of the inscriptions followed by their English translation are taken from the fine publication **Roman Inscribed and Sculptured Stones in the Hunterian Museum, University of Glasgow** by Lawrence Keppie (1998) (see reference 9/ in the following Bibliography)



Fig. 36 Two images of Distance Slab RIB 2139 from Bridgeness, West Lothian.

Approx. size of stone: H. 0.84 m; W. 2.89 m.

Material – Buff sandstone

Inscription: *Imp(eratori) Caes(ari) Tito Aelio/ Hadrian(o) Antonino/ Aug(usto) Pio p(atri) p(atriciae) Leg(ionis) II/ Aug(usta)/ per m(illia) p(assuum) IIIIDCLII fec(it)*. “For the emperor Caesar Tito Aelio Hadrianus Antoninus Augustus Pius, Father of his Country, The Second Augustan Legion (built) this 4,652 paces”. (translated by me)

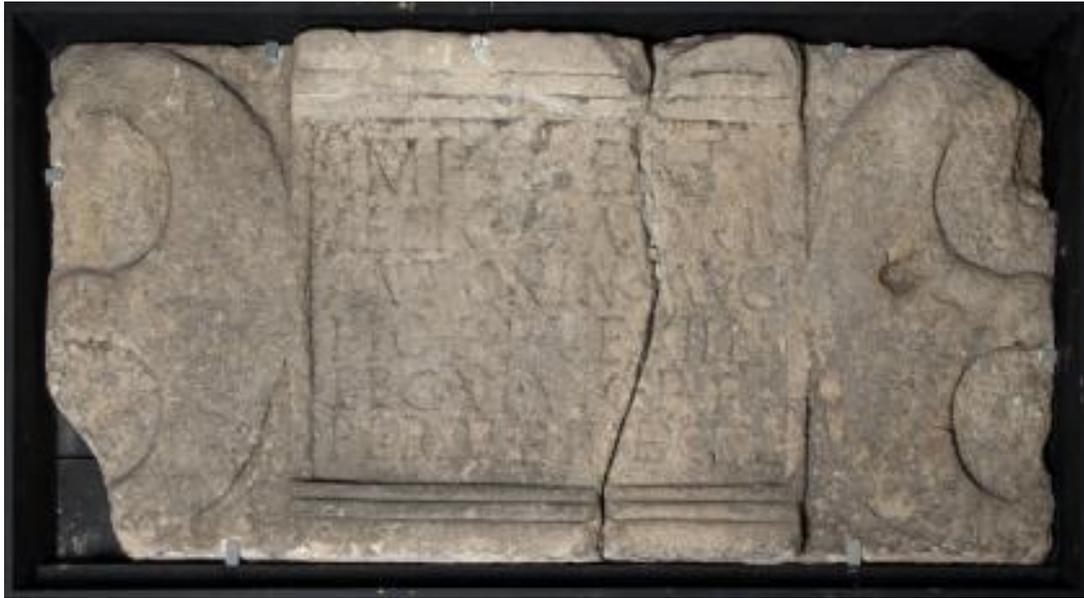


Fig. 37 Distance Slab RIB 2194 from Millichen, in the area of Summerston near Balmuidy Fort.

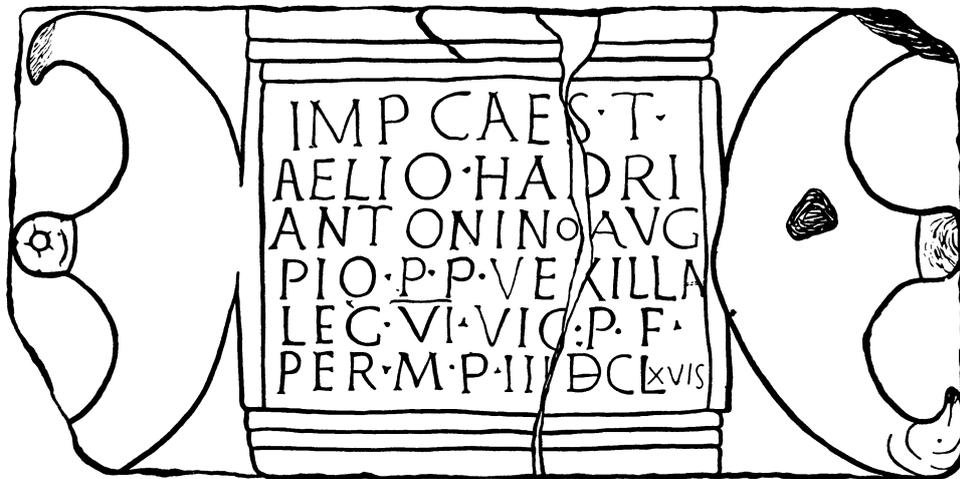


Fig. 38 Hand drawn sketch of Distance Slab RIB 2194 from Millichen, in the vicinity of Summerston near Balmuidy Fort.

Approx. size of stone: H. 0.75 m; W. 1.5 m. Material – Buff sandstone

Inscription:
Imp(eratori)
Caes(ari)
T(ito)/ Aelio
Hadri(ano)/
Antonino
Aug(usto)/ Pio
p(atri)
p(atriciae)
vexilla(tio)/

Leg(ionis) VI Vic(tricis) p(iae) f(idelis)/ per m(illia) p(assuum) IIDCLXVIS. “For the emperor Caesar Tito Aelio Hadrianus Antoninus Augustus Pius, Father of his Country, The Sixth Victorious, Loyal and faithful Legion (built this) 3,666 1/2 paces”. (translated by me)

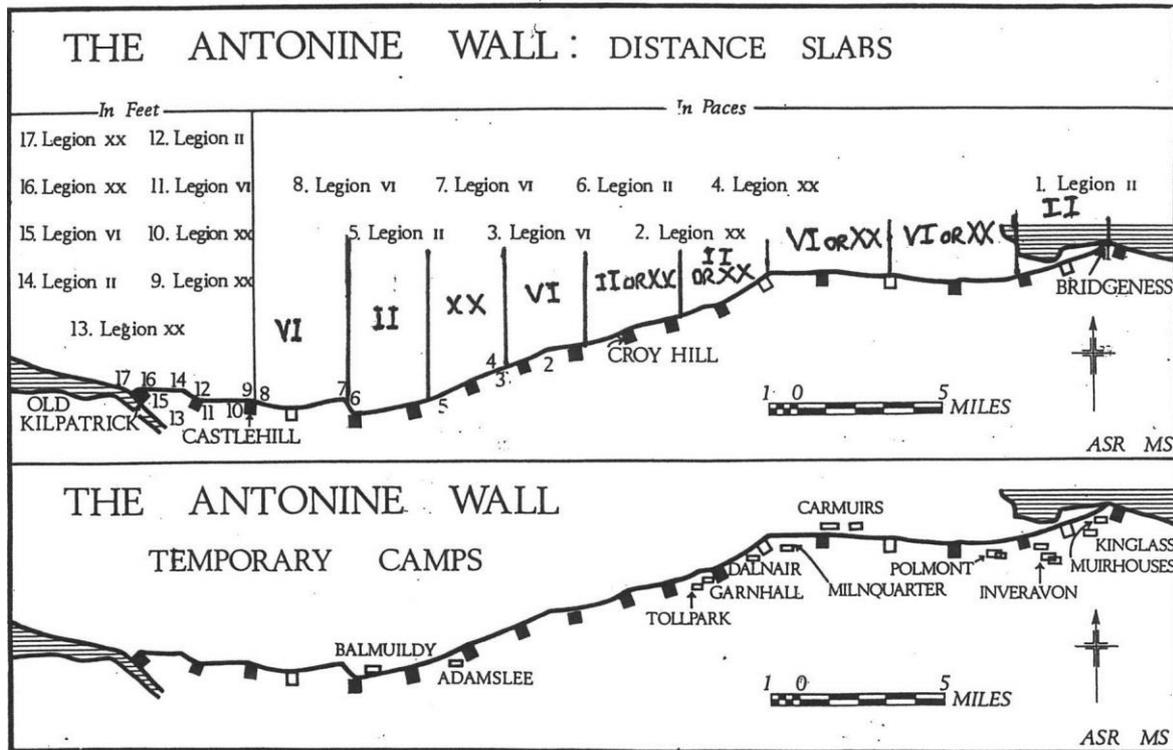


Fig. 39 Map showing distribution of distance slabs along the Antonine Wall with the number of the Roman Legion responsible for the erection of the nominated section attributed to the section shown (some attributions are not precisely known as indicated).

MIXED USE OF MEASUREMENT UNITS ON THE DISTANCE SLABS
(Additional notes since paper first written)

For the very astute it will have already been observed that the distance slabs found have units in either Roman feet or paces or in the case of Slab 3 both are stated. In addition to this fact there is also the denser occurrence at the western end of the Wall where it is obvious that the three legions responsible for its erection took charge of their assigned sections which were much shorter than the first nine components of the project starting at Bridgeness at the eastern extremity (see Figure 39 on this page as well as Figure 7 for an enlargement of the western end). Along these longer sections which were built first the units adopted to record the length of their contribution were the longer unit of a pace (*passus*) which is five (5) Roman feet with slab 3 utilising both paces and feet to list the distance of their piece of the achieved structure. Although Section 9 is one of the longer sections Slab 7 is recorded in feet while Slab 6 adjacent to where this stone inscription was discovered is in paces. It is not surprising that Slab 8 is in feet as it may be associated with the shorter lengths which commenced at this point. Using the smaller distance unit is logical along those sections less than 1000 paces (5000 Roman feet = one Roman mile) which is certainly the case along the far western corridor of the Wall while along the lengthier portions paces were employed with one slab

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bearing both units to list its total section work as before mentioned. Why the sections were reduced so substantially is not fully understood but one theory espoused by the web site www.antoninewall.co.uk is worth mentioning here. A brief note says that the shorter portions are a result of construction resuming after a significant delay thus requiring the building time needed being less for its completion resulting in reduced sections to construct. RIB 2194 was found near the site of Balmuidy Fort in the centre of Section 8 and thus being a longer line the distance is stated in paces (3666^{1/2}) – see Figure 38.

BIBLIOGRAPHY

- 1/ Bailey, G.B., **The Antonine Wall: Rome's Northern Frontier**, (Falkirk, 2003).
- 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., "Hadrian's Wall: Boundary Monument for the Northern Frontier of Roman Britannia", **FIG History Symposium**, (FIG Working Week 2017, Helsinki, Finland).
- 5/ Campbell, Brian, **The Writings of the Roman Land Surveyors; Introduction, Text and Commentary**, (Society for the Promotion of Roman Studies, London, 2000).
- 6/ Hanson, W.S., **The Antonine Wall**, (Edinburgh, 1986).
- 7/ Hassall, M., "The building of the Antonine Wall", *Britannia* 14 (1983) pp. 262-4
- 8/ Hodgkin, Thomas, **The Letters of Cassiodorus**, (Oxford University Press, 1886).
- 9/ Keppie, Lawrence, **Roman Inscribed and Sculptured Stones in the Hunterian Museum, University of Glasgow**,
(Society for the Promotion of Roman Studies, London, 1998).
- 10/ Keppie, Lawrence, **The Antiquarian Rediscovery of the Antonine Wall**,
(Society of Antiquaries of Scotland, Edinburgh, 2012).
- 11/ Keppie, Lawrence, **The Antonine Wall: Handbook to the Surviving Remains**,
(Glasgow, 2001).
- 12/ Moorhead, Sam and Stuttard, David, **The Romans Who Shaped Britain**,
(Thames & Hudson Ltd., London, 2012).
- 13/ 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).
- 14/ Robertson, Anne S., **The Antonine Wall: A handbook to the Roman Wall between Forth and Clyde and a guide to its surviving remains**, (Glasgow Archaeological Society, 1968).
- 15/ Roy, William, **Military Antiquities of the Romans in North Britain**,
(London, 1793).
- 16/ Shotter, David C.A., **The Roman Frontier in Britain: Hadrian's Wall, the Antonine Wall and Roman Policy in Scotland**, (Carnegie Pub., 1996).

On the net:

1/ www.antoninewall.co.uk

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 on six continents including Brunei, Nigeria, Morocco, Papua New Guinea, Hawaii, Bulgaria, Finland, Colombia and all states/territories of Australia as well as Norfolk Island. Stalwart of FIG International Institution for the History of Surveying & Measurement awarded **FIG Article of the Month March 2005, January 2012, June 2014 & April 2017**. 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 Cemetery and St. John's Cemetery.

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