PENRITH`S

ROMAN

HERITAGE.

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T.C.BELL

This publication does not claim to be a Roman history of Penrith and it`s outskirts, the original sources simply do not exist. Nor is it a blow by blow account of excavations. As an engineer and surveyor, my objective has been to record the major sites of Penrith`s Roman Heritage. This publication also attempts to highlight the technical abilities of the Romans and list some of the sites where these feats of engineering can still be viewed. Nor does it claim to be a complete list of every single Roman sites in the area, in 350 years of occupation the Romans built on hundreds of sites in Cumbria. Sadly, in recent years several of these major historic sites have been destroyed, without their existence being officially recorded. This means that little by little, our opportunities to record our interesting past are being lost for ever. The failure to appreciate the existence of one strategic site can completely change the perception of the occupation for that area. No one is suggesting that we do not build on historic sites, life must go on. But we should record their existence and not be oblivious to the historic tourism value of quality Roman remains and be prepared to retain the best. We get but one chance.

On the domestic front, in an area such as Cumbria, with it`s hundreds of Roman sites, serious problems have already resulted from ignoring, or even denying, the existence of such sites. One constant danger is the presence of the Roman`s deadly legacies for developers, still functioning aqueducts. Buildings or roads, constructed over Roman aqueducts are liable to settlement. Contractors excavating for new services, can and do, cut through and block these often still functioning aqueducts, some are an integral part of the thousands of metres of infilled canals around Penrith. Many aqueducts still function as drains, until severed and blocked, invariably resulting in flooding of the area. All the resulting problems have a common link, denials of responsibility by the perpetrators.

Why Study History?.

Examples of What Happened When Politicians Have Failed to Learn From The Past
Many folk question the point of studying history. But when questioned, they would agree there is little point in trying to re-invent the wheel, nor by re enacting the failures of the past, normal folk learn from past experiences. But not politicians. Historical records tells us that well armed countries always commanded respect and hence security for their populations. Weakness often equalled invasion and slavery for their populations. Hence the multi invasions of Britain. Politicians invariably ignore the lessons of history. Mrs Thatcher & Co`s removal of the Falkland`s guard ship and the “For Sale” notices on our remaining aircraft carriers, prompted the invasion of the Falklands by the Argentinian Government. If they had waited for another month, Britain`s carriers would have gone

and Argentina`s flag would today fly over the Falklands. But, the Argentinian commanders also ignored the lessons of Pearl Harbour, the power of aircraft carriers and their elusiveness. As had the Thatcher Government, hence putting ours up for sale and after Falklands, scrapping them. The latest examples of politicians with a disdain for the lessons of history are Messrs Blair and Brown, neither with any experience of warfare. Totally ignoring the recent lessons of the Falklands, bought at a terrible price in men and ships, they set out to further downsize our forces to little more than a local defence force

capability. Their deliberate destruction of the British Armed Forces, included disposing at giveaway prices of several new frigates and minesweepers, all vital for protecting our extended lines of maritime supply. Several army regiments were disbanded in major recruiting areas, presumably to make recruiting more difficult. Then in an act of supreme folly, being totally oblivious of the recent histories of these two countries. Messrs Blair and Brown decided to invade Iraq, followed by Afghanistan. That armies in recent times, ten times the size of Britain`s, had failed to invade and control those countries was beyond their understanding. Needless to say, yet again the troops continue to pay the ultimate price for the ignorance of politicians. Now Cameron show his disinterest in history.

BACKGROUND

My first history master, Mr H.B. Jones, a brilliant teacher, inspired my interest in history. H.B`s. life`s message, attributed to Rousseau was “That man is born free, but everywhere is found in chains”. So when I was finally released from my virtual chains after 47 years of employment, I was free to commence following, virtually full time, the Roman and later the Chinese trails. I am still fascinated by their engineering skills. I have been fortunate to have experienced a lifetime of interesting and varied engineering, from marine engineering with Blue Funnel Line, as an engineer surveyor in Birmingham, the (then) “City of a Thousand Trades”, works engineer of Delta`s foundry and extrusion plant in Birmingham, works engineer, then production manager of Castrol, then the largest lube oil plant in Europe and finally surveying with North West Water in Cumbria.

With my marine background, the Roman use of water borne transportation has been of special interest. In this field I was extremely privileged to have spent six years studying with Raymond Selkirk, marine navigator, airline pilot, Roman archaeologist and original thinker. The late Ray Selkirk was the first to fully understand and highlight the Roman use of water for Britain`s first industrial revolution. Roman canals, not their roads, formed their transportation highways, the roads were used for fast troop movement and light cartage. In Britain`s second industrial revolution in the 18th and 19th centuries, again canals became the transportation highways. Without canals there would have been no industrial revolutions. A notice in the Falkirk Wheel museum states “A horse on land can only pull a one tonne cart, but a 60 tonne load, if it is on a canal barge”. Unless you understand the Roman use of water you cannot understand the Roman way of life and certainly cannot hope to fully understand and evaluate Roman sites.

FOLLOWING THE ROMAN AND CHINESE TRAILS.

My last 15 years of self funded historical research, have been mainly spent on the trail of the Roman in the North of England, Scotland and it`s major islands and even into Ireland.

Yes, the Romans did occupy Ireland. My own surveys located a line of forts from Dublin to Galway City, Galway Bay. Since 2003, my research has extended to following the Chinese trail in New Zealand and Cape Breton Island, Nova Scotia and nearer home, strange as it may seem, on Inishmore, Aran Isles, Galway Bay, the Isle of Arran and most surprising of all, a complete Chinese town and fort at Laversdale NY47710-62343), just north of Hadrian`s Wall, and Carlisle Airport. The Chinese and Romans traded and exchanged engineering information from 170BC. The maritime silk route also used the

canal constructed by Pharoah Necho 11(610-595BC, this canal linked the River Nile with the Red Sea. I recently decided that as immortality was very doubtful, it was time to record my Roman surveys for posterity. My New Zealand surveys which both located the Chinese lost fleets and proved the Chinese occupation for c 1,700 years, prior to the arrival of Europeans, have been recorded by Gavin Menzies in 1421 "The Year China Discovered the World" and in his latest book 1434, "The Year a Magnificent Chinese fleet Sailed to Italy and Ignited the Renaissance". These surveys are also accessible on the 1421 and 1434 web sites. Our Nova Scotia surveys, which also proved that the Chinese had one 80sq km site and several smaller ones on Cape Breton Island, have been recorded by Paul Chiasson, in his book "An Island with Seven Cities". This was possibly the base from which the Chinese specialists operated when subcontracting to the Romans in Ireland and Britain.

These surveys, both overseas and in the UK, including Penrith, have frequently shown that the recorded histories of the areas have been at variance with what is physically visible on the ground. For example in New Zealand, for political reasons, the government claim only a Maori occupation since c1340AD and ignore both the indigenous population and the Chinese occupation prior to 1340AD. Our carbon dating of New Zealand`s Chinese sites, range from 190BC to late 1600AD. These sites range from harbours, ore exploitation sites, settlements and even three walled cities, to many wrecked junks, one a 120m x 50m "Super" junk. A large commercial iron smelter site provided a slag date of 1,100AD, 240 years before the arrival of the Maori. So when the Normans were completing their occupation of Britain, the Chinese were already smelting iron on a commercial basis in New Zealand. Recent dating of cave iconography in New Zealand`s South Island, by a Chinese expert, suggested a Chinese c 4,000 year old origin.

This year 2009, Professors John L Sorenson and Carl L Johanessen published their latest book, "World Trade and Biological Exchanges Before 1492." 1492 was the year that Columbus claimed to have discovered America. The book lists around 100 cultivars, plants and bushes cultivated by man for food, that were transferred from the New World to the Old World. Over half of these transfers involved fauna being transfered from the Americas to Europe, Asia and Oceania before 1492, many were transfered over 3,000 years ago. The oldest evidence located to date is the presence of four East Asian parasites in central Brazil 7,350 years old. Proof of ancient man`s world wide ocean trading. botany. Recently biologists have also identified that Europe`s Plagues originated in China.

For examples nearer home of the physical evidence being at variance with the written history. In 2007, my first book of the "before it`s too late" series was published, it`s title

“Three Roman Harbours on the Moray Firth”. This is the area where historians claim that the Romans never settled, only fought a major battle, Mons Graupius. With the assistance of my Portsoy colleagues, we located two of the large burial grounds of several thousand who fell in that battle. The inhumations are orientated north - south. Also located were the still visible ramparts, recorded by the Roman historian Tacitus, who stated Agricola stationed his legions backs to, prior to the battle. The existence of the ramparts, a Roman permanent defence line, confirmed their settlement of the area to exploit the local iron ore.

In the same area we have located a plethora of evidence of the Roman occupation. This includes the walled towns, Portsoy and Cullen, Portknockie`s settlement, harbours, canals, and a still recognisable amphitheatre, the most northerly ever located and probably the finest example in provincial Britain. At one of Portsoy`s forts, the owner`s excavations had found, several baked clay slingshots and a fascinating carved bone model of a Roman tub chariot. The chariot covered in gold leaf was presumably a prize for a charioteer, it is the only one ever located in Britain. The surveys located the line of a previously unknown series of defensive dykes, rivalling the vallum flanking Hadrian`s Wall, suggesting that these defended an enclave backing onto the Moray Firth. One wonders if these were constructed before the Romans actually invaded and subdued all of Scotland. In the Moray Firth area, despite very few excavations, 40 Roman coins of all dates have already been located, many covering the periods 177AD-182AD when historians claimed the Romans had abandoned the Antonine Wall and ditch (canal) and moved southwards. The reality appears that the Roman had gone north, not south. Yet despite intensive excavations along the Antonine Wall, only c140 coins have been located.

Further proof of the Roman permanent, not transient occupation, are the enormous voids in the Cullen and Portsoy cliffs, created by the extraction of over two million tonnes of spoil to access the iron ore. Cullen`s 18hole golf course now occupies one excavated site. Yet all this highly visible evidence went unrecorded, until my surveys were published. Portsoy is the only area where I have ever encountered an oral tradition of the Roman occupation. In recognition of my surveys, I have been honoured by Portsoy to be invited over a four year period to be a guest speaker at the Portsoy Boat Festival. The Aberdeenshire and Moray Libraries also stock my book in their reference sections. Ian Keillar, author of “Romans in Moray”, who tried for 40 years to interest the “Establishment” in the Roman occupation off Moray, said when viewing my book, “one only has to look at the photographs to appreciate the visible evidence of the Roman occupation”.

UNDERSTANDING ROMAN SITES. PENRITH AND LAKE DISTRICT AREAS

No doubt, readers of this publication will also have wondered why so many of the large Roman sites in the North East go unrecognised. Or why organisations such as the Lake District National Park (LDNP) can publish brochures re Cumbria, which state that no Roman ore exploitation sites have been found in the Lakes. Sadly it is just a question of field training recognition, or the lack of it. Just around Ullwater there are dozens of ore exploitation sites. Eg Bennetthead with it`s huge terraces. Salmond Plantation with most of the top removed. Moor Divock has been totally changed by ore extraction. Large smelter ramps are visible alongside the bridle path at Winder Hall. Nearby the bearings of

one Roman crusher set in a limestoneblock are still visible A lack of understanding of Roman engineering can also result in quaint claims, such as National Park, stating that Hodgson Hill alongside Ullswater, was Tristermount, a castle of one of King Arthur`s mystic knights. The hill was actually formed from spoil excavated from the adjacent and visible Roman harbour and a walled cavalry barracks was constructed on the hill. A trial excavation on the hill located the stone floor of the officer`s room. The site had been fired. Tristermount (Farm), is actually some 600m to the SE, now named Cross Dormant, the

name changes are well documented and also confirmed in the local 19th cent sheep marking hand book, these are very useful guides to farm ownership. The 2009 floods washed away a large amount of Hodgson Hill and exposed a carbon burn line along the line of the section of exposed barracks and also a section of a burnt post hole. An excavation into a granary at Swarthfield Fort alongside Ullswater, also showed evidence of firing. These excavations, combined with the excavation of the fired granaries at Sockbridge Mill House, suggest the Romans operated a scorched earth policy when they left Cumbria. What I find really sad is that the National Park wax lyrical re Wordsworth and such, but totally ignore the decades of work carried out by the many dedicated, self funded skilled surveyors whose expertise revealed Cumbria`s Roman legacies. One of these Roman experts, Dr Martin Allan, used to travel from Scotland in all weathers to survey in Cumbria. He once said to me, sadly, maybe I`ll get my reward in heaven. He certainly will never obtain any recognition from the Lake District National Park.

As an engineer I frequently wondered. Why do archaeologists have difficulty in identifying Roman sites and even, why are some developers allowed to build over obvious Roman fort sites, without any pre construction archaeology surveys?. So I commenced to analyse Roman construction methods from published excavations, eg M.J.Jarret “The Roman Frontiers of Wales”, Prof.L.Keppie “Scotland`s Roman Remains”, Gordon Maxwell “The Romans in Scotland”. Further information was obtained from visits to excavated sites such as those on Hadrian`s Wall and from my own excavations. I then drew up a list of basic parameters to determine if the site was Roman and if so, what had been it`s function. These formed the basis of a manual, updated with each new type of Roman construction I located. Dozens of copies of this manual have been published, it is now on issue 14. Obviously one cannot excavate every suspected site, nor afford to use expensive and slow electronic geophysics equipment purely for spot checks. All such equipment has limitations on depth and working near water, or iron. Therefore one has to use a cheap, fast, reliable detection system, which has no depth limitations or problems of operating over wet sites, to detect the presence of foundations or ditches. Then having located and evaluated the interesting areas, one can then employ geophysics surveyors, or directly excavate the chosen area. There is one cheap, fast and very accurate survey method available, one which has been in existence for thousands of years, sadly most folk confuse it with dowsing, and actually call it such, it should be called magnetic anomaly surveying, (MAS).

Dowsing is purely a method for locating water and has also been in use for thousands of years. Dowsing depends on the operator locating the electricity generated by molecular excitation as water runs through fissures in the country rock, then interpreting the results.

The greater the flow, the greater the electricity generated. A skilled operator then equates this to the position and volume of the maximum water flow and the depth required to access the water. In pumping water white liquids in refineries and chemical plants, (eg Petrol, Benzene, White Spirit etc) this propensity for generating electricity can be extremely dangerous, if flammable vapours are present. To obviate the risk of stray currents causing an explosion, the pumping speeds of liquids are controlled around 3m.p.sec and all pipe joints are bonded with copper strips and all equipment earthed.

Magnetic anomaly surveying is the term that should be used for the method used daily by servicemen, ground works operators and farmers. It is even taught by enlightened agricultural colleges to future farmers for detecting drains and services. But sadly, not to students of archaeology. One military use for this method commenced in 1942 by Coastal Command aircraft to locate submarines by the change in the earth`s magnetism created by the presence of the submarine`s hull, not it`s magnetism. The method is still in use. This method operates by recording the deviation in the magnetic lines of force caused by any underground item, ie building foundations, Roman aqueducts, pipes, drains, electrical cables. Igneous dykes intruding into country rock also create an anomaly, as do metallic ores either intruded into the country rock, or deposited in sedimentary rocks. I have also used an electronic version called a magnetometer gradiometer for verifying the presence of a wrecked Chinese Junk buried by sand, it`s presence being first noted by manual magnetic anomaly (MAS). Another verification of the accuracy of MAS.

The sole reason the Romans came to Britain was to exploit the metallic minerals. So to have any success in following the Roman trail, so among other skills, a requirement for a basic knowledge of geology is required. Hence my joining a like minded group, we call "Bell`s Rocky Tours" headed by Dr Andrew Bell, a brilliant lecturer in geology, based in Penrith. It has been fascinating following the geology trail and the parallel Roman one. It is very obvious that the ancient miners knew that an identification of a magnetic anomaly, equalled metallic ore impregnation of rocks, or that an igneous intrusion, dyke or sill, often signified metallic inclusions. This is primarily how the ancient miners located the seams of ores within the country rock. Their knowledge of botany, ie identification of which plants associated with certain ore bearing rocks, also aided their explorations.

IS IT A ROMAN FORT?. THREE BASIC CHECKS.

The basic civil engineering design of Roman forts are the same, wherever one goes. Thus the same bench marks can be used for every site`s determination. Is it a Roman fort or not?. As flat areas in Cumbria are few, many of Cumbria`s forts were built on hillsides. Thus the down hill side had to be built up to provide a level platform on which to construct the fort. In reality, to assist drainage the surface was left either with a slightly down hill slope, or on earlier hill top forts, a slightly curved top. A good example of the pronounced curvature of an early Roman hilltop fort can be viewed by driving up Carleton Hill Road. Most of the fort is now covered by the Carleton Heights estate.

The construction of a selected site firstly commenced with it`s clearing down to ground level. Then, as on modern building sites, the drains were laid. Firstly a one metre diameter rubble drain was laid running downhill under the proposed fort site. Uphill,

from the line of the fort`s wall, a set of herringbone style drains were laid, these connected into the main rubble drain. Often the first indication of a Roman hillside fort is the discharge from this drain, akin to a Cyclops eye, in the middle of the fort`s ramparts. A good example is the weeping drain in the centre of the ramparts of the Waterside House fort, best viewed form the Howtown Road, by Waterside House. Next a strip c 3m wide was excavated under the line of the proposed walls. Then a foundation of cobbles laid, this was wider than the walls ie the cobbles overlapped the wall for stability. The

presence of the deep cobble foundations, even if the site has been ploughed, enables it to be identified. The first basic test for the presence of a suspected Roman fort is to scan for these foundations, by locating the magnetic anomaly, created by the foundations. This identification enables the complete line of the fort`s walls to be located and pegged out in minutes at walking pace.

Outside the fort walls, invariably the Romans dug four concentric lines of defensive ditches. Even when the ditches are backfilled, the ditch edges create a magnetic anomaly. A scan across the line of the ditches at right angles to the fort`s ramparts, will locate eight ditch sides, ie four ditches. Inside the fort, the narrow foundations of the barrack blocks form a ladder like formation, roughly 45m long and 4m wide ie ten rooms, unpaved, with one paved room for the officer, akin to the manager`s carpet. Only later forts contained double rooms, ie ten day rooms and alongside, ten bedrooms. Such forts as these are rare in Cumbria. So to answer the question, is the site Roman?. The survey has to locate, the ditches, the rampart`s foundations and internal barracks. If the three boxes are ticked, it`s Roman. As one obtains greater skill, all the fort`s internal buildings such as granaries, offices, wells and drains, can be located. Also by following the overflow aqueducts of the fort`s spill wells the foundations of the toilets and wash rooms external to the fort can be located. It is as simple as that, all without intrusive damaging and expensive digging.

THE VALETTA AGREEMENT.

Sadly, a common factor in archaeologists of whatever discipline appears to be a dislike of the self funded, knowledgeable “None professional”, who actually find the most. Hence the widespread delight at the British Government becoming signatories to the Valetta Agreement. This agreement was allegedly designed to prevent the illegal excavation and sale of valuable artefacts, something which is very rare in Britain. In Britain we have a reasonable reward system for folk who have often spent a lifetime in obtaining a skill and funding it, who may make a once in a lifetime, major, valuable find. Some countries say, anything you find is the governments, just hand it over. An attitude hardly conducive to honesty. The Valetta Agreement, a typical EU agreement, sought to charge all excavators and researchers a fee for a licence, issued to only to those with a formal qualification in archaeology or history. Our government thought what a wonderful way to raise even more money. Then reality kicked in, the myriads of so called amateur archaeological and historical societies throughout Britain, all voters, started getting restive. This act, if implemented in Britain, would have immediately criminalised the activities of every single archaeological and metal detector society at a stroke, including family tree researchers. These are the folk, together with JCB drivers, who are actually responsible

for the majority of finds and not least the mapping of Roman Roads. So the fee charging idea went on hold and the “none” recognition of major finds by amateurs went into operation. So if you find a bent Anglo Saxon coin, it will be met with interest, but, if it is a major fort, it will either be denied furiously, or go on hold until you get the message. That only card carrying archaeologists can actually locate historic sites.

HISTORIC SITES, ERRORS and OMISSIONS..

From my surveys of the Penrith area, where I have lived for 22 years, it is apparent that

there is an ongoing unwillingness within local government bodies to recognise the huge number of highly visible Roman sites which exist in the area. In the absence of transparent policies, one can only make assumptions as to the reason for the unwillingness to recognise obvious historical sites. (a) Ie The Valetta Agreement in operation, when none archaeologists highlight sites. (b) Lack of appropiately trained staff in Roman engineering, especially of their use of water for transporation. (c) Political and commercial pressure, ie High costs and delays to planned housing estates incurred by requirement for archaeological excavations and possibly the cost and ongoing problems of complying with the National Monuments / English Heritage conditions on land in future years.

This is an example of how the existence of a Penrith Roman fort with visible ramparts was ignored. Following the construction of a housing estate on Carleton Heights Fort, Carleton Hill. I requested in writing, under the Freedom of Information Act, to Cumbria County Council for sight of the pre survey report. The council were unable to comply with my request, which of course suggests that a survey had not been carried out. But why not?. The Roman fort`s ramparts are still clearly visible. I was also able to photograph the ends of several barrack blocks exposed during the construction of the housing estate. So the evidence was freely available. Similar archaeological vandalism has resulted in several of the area`s historic sites being destroyed without being recorded. So in an attempt to prevent any further unrecorded destruction I notified the local councils that Penrith`s proposed Squares Development site, Southend Road, contained the foundations of a Roman suburb. For a short period I wondered if the resulting pre development archaeological excavation was a change of local policy. For interest, I watched the first excavations into the Southend car park. In discussion with one archaeologist, a pre historian, I was horrified to hear the comment that Romans did not construct harbours in towns. Yet there was one within a hundred metres of where we stood. This comment indicated not only an inability to recognise Roman harbours, but also a lack of knowledge of Roman logistics. In Romanist archaeological circles it was well known that Rome`s huge supply harbour and many craft, had recently been found near the city. All major papers carried news of the excavations. The Romans constructed as many inland harbours alongside their town`s granaries and shops (forum), as today we would build lorry parks at supermarkets and for the same reason. As one with extensive experience of marine, road and rail logistics, I find it quite odd that archaeologists will write screeds about Roman life on the “The Wall”, or in towns, yet totally ignore how the soldiers and civilians received their supplies. Then, when the methods used by the Romans are explained, deny them.

A few years ago, I also had a very saddening experience with a Scottish archaeologist employed in local government, who claimed that my survey (free) for the local museum, was rubbish as “Roman canals could not go up hill”. Part of my survey report included the ladder locks at Wanlockhead, one of the best examples of Roman ladder locks in Britain. No alternative explanation was forthcoming. Sadly, yet another person ignorant of the abilities of Roman, Chinese and Phoenician canal and lock constructors. The first Suez canal constructed around 600BC, had a lock, it was probably constructed by

Phoenician engineers. Little wonder that that the Drumlanrig Castle site, near to Wanlockhead, with the finest hydraulics of any Roman site in Scotland, also went unrecognised. I was privileged to survey the Drumlanrig Castle site (Queensbury Estate) for the late Duke of Buccleuch.My surveys located a 300acre Roman fortress and an overlapping 120 acre fortress, with a lovely D shaped theatre, formed in a quarry site. A small Roman town also with a small theatre was located nearby. One of the fort`s within the fortress was part excavated by the Television Time Team. This fort had been recognised following a nearby aerial survey.

HADRIAN`S WALL The LAST EAST-WEST FRONTIER & the FIRST FRONTIERS.
Note. Ordnance Survey references quoted are prefixed with NY unless quoted otherwise. Whilst the nearest section of Hadrian`s Wall is roughly 25mile north of Penrith, without the nearby Carlisle to Newcastle Roman frontiers, Penrith would have been merely a small town, by a major river crossing. Not the site of a major town, a 600acre fortress and several governor`s residences. So I make no apologies for including a section on Hadrian`s Wall, the last of several Roman defence lines between Carlisle and Newcastle.

Whilst the Hadrian`s Wall area, next to Stonehenge, has probably been the most surveyed and visited monument in Britain, most archaeologists and historians still continue to deny that the forts along the Wall were supplied by canals and canalised rivers. At the 2008 Lancaster University Roman Forum, in response to my question to a spokesman from Vindolanda. Had any Roman harbours been excavated on Vindolanda?. The answer to the audience was. That Vindolanda fort site, immediately south of Hadrian`s Wall, was too high (c70m) above the River Tyne to have been accessed by canal. Another adherent to the “canals cannot go uphill theory”. In reality, the highest Roman canal lift I have located is the 340m from Ullswater to High Street. There is actually no limit to canal lifts, as long as there is a supply of water at a higher level and you have time. Not being able to resist a challenge, I surveyed the area between the River Tyne and Vindolanda. There was clear evidence that Chainley Burn which connected Vindlanda with the River Tyne, had been navigable and used as a transportation highway. Short, difficult lengths of the burn had been byepassed by the construction of flanking canals.The canal extended northwards from Vindolanda, to link in with the East-West canals flanking Hadrian`s Wall. Several of Vindolanda`s high level harbours, lined with puddled clay, were also located. Sadly, the Vindolanda representative has yet to acknowledge the surveys I sent him. Presumably he is saving up for a new shirt, as before the Lancaster University audience, he had offered to eat his shirt if Vindolanda was supplied by canal.

I have a lifelong interest in history and its recording. But, I consider it a false sense of priorities to give (2009) Vindolanda four million pounds for a museum, yet close many of Eden`s public toilets to save money and also claim that there is insufficient money to replace bridges damaged or destroyed in the 2009 floods.

It has always been claimed that Vindolanda was one of a line of forts between Carlisle and Newcastle, connected only by Stanegate, a road. My surveys around Vindolanda have showed that this assumption was incorrect and that the foundations of a double

vallum (dykes) and northern ditch, plus an adjacent canal, ie a section of an early frontier, incorporating Vindolanda, existed along Cranberry Brow, NY75626-65769, west of Vindolanda. Obviously at some time pre Hadrian`s Wall, this frontier, a pair of flanking rammed earth dykes, was realigned further north and now forms the vallum. The Cranberry section was either dismantled, or fell into disuse and was ploughed out, leaving just the foundations in place and Vindolanda behind Hadrian`s Wall.

My surveys along the Newcastle to Carlisle route have shown that the first Roman defence line, of probably four over the years, was actually south of the River South Tyne, NOT, north of it, the route now taken by Hadrian`s Wall. The first Roman defence line, comprised parallel double dykes on stone foundations, and a 6m wide ditch, (these are easily detected, without excavation, by magnetic anomaly). R.Selkirk in his “On the Trail of the Legions” stated that surveys had located the ditches of a Roman fort alongside Hexham Abey and also that Hexham was on the line of an early Roman east west defence line. My surveys indicated that the first defence line ran on the north side of the hills overlooking the South River Tyne, on a line from Hexham to Plenmellor, (south of Haltwhistle). I was unable to locate survey details of the Hexham site other then Ray Selkirks, so I have included my survey, carried out with the use of Magnetic Anomaly. One is automatically led to the sites mentioned by either visible ridges or depressions.

Hexham is an interesting market town with large accessible carparks, modern toilets, interesting shops and a large central park and football field. Coming from the shambles of Penrith, one is envious. Hexham Abbey is situated on a commanding ridge overlooking the River South Tyne, within a public park. Immediately south of the Abbey, the ramparts of the Roman fort referred to by Ray Selkirk are visible, (93447-63991). The 100m x 70m fort was orientated north-south, and was garrisoned by 480 men, a cohort. The six barracks are all of an early design and contain 10 unpaved rooms and one paved room for the officers. The raised area at the south end of the fort was a signal tower. At the south east corner of the park, by the stone plaque to three local distinguished military men are the foundations of a military bathhouse c36m x 10m (93400-639290) with an adjacent temple and toilet, 93416-63946. These all drained into the nearby beck, which had been navigated. The depression by the bandstand was the harbour, 93375-64032. The fort`s toilets were north of the bandstand, 93416-64075. A walled granary compound was located west of the Abbey and north of the bandstand, 93414-64117. Often such sites were used as Priories due to their good drainage, heavy foundations and availability of cut stone. The complete park site including the Abbey, was originally walled, the overlapping stone foundations are still in place. The presence of triple gates (in line),

located in the Abbey`s internal green by magnetic anomaly, suggests that the previous site included the residence for a senior Roman official.

The most fascinating site in the park, is west of the Abbey. The rubble foundations of the 70m x 10m insulae of a small Roman town lie under the football pitch, 93251-64204. Towering over the major part of the Roman town (and football pitch) is a long ridge, called “The Seal”. The upper section of the “The Seal” is a 120m long, man made whale shaped platform. This is a typical construction which the Romans constructed to house a

town`s walled, in line services, the forum, (shops), 93182-64056, basilica, (offices),toilets, bath house and at the extreme east, the temple, 93297-64044. To date, I have located ten of these whale like constructions, from Scotland to Cumbria, all built to a standard design and containing the same services. The harbour 93091-64100, via which the forum was supplied, is at the base of the western cliff, adjacent to the river, south of the Totem Poles.

EARLY ROMAN FRONTIERS

Several years ago, my surveys showed that a pre Hadrian`s Wall, Roman defence line had run south west from Lanercost Abbey, a large Roman fort, (not west as Hadrian`s Wall finally did), then via Brampton and then back to the existing route of Hadrian`s Wall and the vallum line via Irthington, the site of a large Roman harbour (511-611). Following my survey, a friend gave me a copy of G. Neilson`s (a lawyer), identical survey in 1891.

So from south to north, we have a succession of Roman defence lines, probably the first east- west line was the Hexham-Plenmellor Line, then Cranberry Line, (Vindolanda etc, Stanegate), then the vallum, a pair of earth dykes on cobblestone foundations, flanked by canals. Finally Hadrian`s Wall. There are also a pair of earth dykes on stone foundations, from Newton to Longtown and westwards, north of the final route of Hadrian`s Wall through Rockcliffe. The section west from Longtown, has yet to be surveyed, it possibly linked into the Devil`s Dyke, by Drumlanrig, forming a defence line for north Solway. A few years ago I reported to Historic Scotland that dykes linked Caerlaverock to Dumfries. sections ran eastwards, possibly to Hadrian`s Wall. The clue is from a geologist, G.A.L.Johnston in his “Geology of Hadrian`s Wall”. He commented that all the mines and productive mineral veins lie “just south” of Hadrian`s Wall. The siting of “The Wall” was apparently based on a commercial not defensive decision. If in doubt, ask a geologist.

HOUSESTEADS FORT ON HADRIAN`S WALL

Rightly the fort at Housesteads is regarded as one of the “must visit” forts on “The Wall”. It is normally depicted as the Roman equivalent of Siberia, as a lonely, sparsely populated site. I have made several surveys of Housesteads, one with my colleague Dr Andrew Bell, a geologist. This survey was to confirm the existence of Roman canals flanking the real line of the vallum, double dykes on stone foundations and to disprove the line of the vallum alongside Housesteads Fort, as shown by Ordnance Survey. Ie It is shown c 400m too far north. The stonework of the canal locks was analysed as being igneous ie ex Whin Sill, yet the canals runs through sandstone. The report was fully accepted by the Ordnance Survey and it`s quality commented on. They explained that they could not re- survey, except by permission of English Heritage. The report and a

covering letter were sent to English Heritage, but, never acknowledged. Obviously the use of canals, as opposed to oxen hauled carts, ran contary to the party line, so the report was suppressed.

My surveys of Housesteads have shown that far from being a quiet outpost on "The Wall", it was actually an extremely busy, iron ore exploitation site, with a very thriving community, complete with a small state of the art, eco town. I located this previously unknown town immediately south of the car park, alongside the B6318. The town

NY7950-6840, covers 3.5ha (8.4acres) is complete with it`s own supply harbour, adjacent granaries, forum, basilica, toilets, temple and even it`s own cemetery. The inhabitants were housed in orderly rows of insulae. South of the town is a huge, now reeded, harbour, this would appear to have been part of the local massive iron ore exploitation operations.

The DANGER IS ALWAYS WHEN THE ESTABLISHMENT`S THEORIES BECOME ACCEPTED AS FACT AND THE ONLY EVIDENCE CONSIDERED.

The REAL ROUTE of HADRIAN`S WALL and the VALLUM, NORTH of CARLISLE

We have always been told by historians, that Hadrian`s Wall ran into Carlisle, then flanked the River Eden to the Solway and then ran westwards. This theory totally ignores the known Roman use of depth defence. No Roman fortification engineer would have put Carlisle, their major western inshore port, in the position of only one defensive wall, being between an attacker and rich pickings. One of the advocates of the "Through Carlisle route" for Hadrian`s Wall was unaware that the wall he had excavated by Carlisle Castle, was actually the defensive wall around the huge harbour system north of the castle. Another excavator by Beamont, (West of the River Eden) had located the stone foundations of Roman defences and assumed it was Hadrian`s Wall, sadly, he was initially unaware that the vallum, an earth dyke, had stone foundations. This error meant that they thought that they had located the long lost Hadrian`s Wall at Beamont, but in reality the Wall ran SW from a point opposite Rockcliffe, c2.5km further north.
One also wonders if they had appreciated that the vallum they had located comprised two parallel earth dykes. (P.S Austen 1978/9. "Recent excavations on Hadrian`s Wall". C&W A&A 1994 Transactions). Using a magnetic anomaly survey, one of course can easily pick up the buried cobble stone foundations of the vallum, or of Hadrian`s Wall.

As an engineer with a lifelong interest in defensive systems, I did not believe that the Romans would have been so negligent as to ignore depth defence. So I surveyed the complete area. I found that Hadrian`s Wall actually circled northwards from Wallby, east of Carlisle to Rockcliffe, then from a point west of the River Eden, it angled back to North End, just east of Burgh by Sands. Immediately after the Carlisle floods, the remains of the stonework of "the Wall" could be seen entering the River Eden opposite Rockcliffe. The vallum (or one of the pair of earth dykes) ran south of Hadrian`s Wall to Cargo, then from Beamont, where a lovely section of these parallel dykes are still standing over 2m high on the west shore of the River Eden. The vallum then ran to near Monkhill, then westwards on the known line. A section of the vallum, ie parallel rammed earth walls,

flanked the River Eden southwards to link into the mound on which Carlisle Castle now stands. A few months after my survey was published, an excavation for the proposed northern Carlisle byepass hit a section of the depth defences of Hadrians Wall. Bell`s survey QED. Interestingly C&W A&A recently re issued W.D.Shannon`s Murus ille famous (That famous wall) it contains several fascinating ancient maps, one by Gough in1350, shows the confluences of the Rivers Eden, Petteril and Caldew around Carlisle and the relation of the Wall to them, ie well down stream at the the mouth of the River Eden at Rockcliffe.

In 1934 F.G.Simpson excavated a section of what he stated was a section of a vallum at Stanwix. C&WA&A Year Book XXX1V pg155. However Mr Simpson does not say if he appreciated that the Roman vallum consisted of parallel dykes. His work is yet further confirmation that the Romans constructed several east-west defence lines.

CHINESE WORLD WIDE OPERATIONS AND THEIR ATLANTIC BASES.

Chinese and Roman trading and transfer of engineering knowledge commenced in c 170BC. Roman trading stations have been located along the western coasts of India and as far east as Vietnam. Evidence of a Roman vessel was located in Rio de Janeiro, Brazil. Recently it has been suggested that that the design of the earliest section of the Great Wall of China had an influence on the Hadrian`s Wall, the final Roman defence system across Northern England and the first with turrets at regular intervals. The earliest Chinese defensive walls of individual states were built of rammed earth, set on a stone foundation. Quin Shi Huangdi (221-210BC) commenced the construction of the first sections of the Great Wall with towers of stone or brick, connected by rammed earth walls. The Ming Dynasty (1368-1644AD) completed the Great Wall, in brick and stone.

The construction of Hadrian`s Wall in stone, with turrets at regular intervals, was a complete departure from the normal Roman design of town, frontier and ore exploitation area defences. Whilst major Roman forts and harbours were defended by stone walls, the defences of towns and frontiers usually consisted of a rammed earth dykes set on an overlapping cobble stone base, with gateways of stone. Towns usually had a single dyke with an external c6m ditch and frontiers and ore exploitation sites, double dykes (vallum) also with an external c 6m wide ditch. So the thought was, did the Chinese influence the construction of Hadrian`s Wall?.

LAVERSDALE. CHINESE TOWN, FORTLET & ROMAN GRANARY COMPOUND..

In 2004, my wife, Paddy and I were surveying around Laversdale and Cumrenton, (north of Carlisle Airport) for the real route of Hadrian`s Wall and the Vallum, ie North of Carlisle, not into it. Paddy noted that a section of an earth dyke had collapsed and exposed a stone core. The core was composed of brick sized sand stone blocks, the courses being laid to form a herringbone pattern. Interestingly, the description of the walls of Angkor Borei, the capital of Funan, Cambodia, were described as having 18 courses of stacked bricks, with an packed earth cover. The description “stacked bricks” suggests a “Herringbone” interlocking design, as opposed to standard horizontal courses of brick. There was extensive trading and technology transfer between China and Funan. Roman coins have also been excavated in Oc Eo, a Funan Port.

We noted and recorded that the stone cored earth dyke, enclosed a large area which contained foundations of a town, with an adjacent fort, then carried on with our survey for the real route of Hadrian`s Wall. These surveys, including the herringbone wall details, were published in the Matterdale Historical & Archaeological Societies 2004 Year Book. (Obtainable in Carlisle and Penrith Libraries). Following discussions re the possible involvement of the Chinese with Hadrian`s Wall and knowing from our own, later surveys of the close proximity of the Chinese bases on the Scottish Isle of Arran, Irish

Island of Aran, Galway Bay and Cape Breton Island, Nova Scotia, a further survey was undertaken around the herringbone walls noted by Laversdale in 2004. Whilst I have maintained our local footpaths for 15 years and also repair drystone walls, I have never seen walls built in a herringbone pattern, least of all within a dyke. I have discussed such walls with Cumbrian professional wallers, none have seen herringbone walls in Cumbria. In New Zealand, we (1421) ran ground radar scans over earth dykes around a large Chinese site. The ground radar located the stone cores of the dykes. The site included a fort, domestic dwellings and large smelter operation. (Smelter slag from the site carbon dated c1100AD).

CHINESE FORTLET GUARDING LAVERSDALE CHINESE TOWN.

The only historical reference I have been able to locate re forgotten towns in this area is from Murray`s 1869 Hand Book,The Lakes, Westmorland, Cumberland, in which he refers to a Roman city called Esica by Netherby (339-716) near Longtown. Rivet & Smith in their “Place Names of Roman Britain” list an Esica, ex the Ravenna Cosmography, but say it is Great Chesters. Fergusson in his History of Cumberland, refers to a Roman fort, now built over by Netherby Hall and states Roman artefacts ex the fort are stored in the house. A hamlet called Cumrenton is 1,500m east of Laversdale, frequently towns whose name ends with “ton” have been associated with a Roman origin.

The village of Laversdale is c2km north of Carlisle Airport. A footpath, east from the village, accesses the site. A prominent man made platform on which the fort was constructed, NY47710-62343 is adjacent to the footpath. The fort guarded the town and the adjacent harbour. The fort c60m x 50m, was defended by double walls c 2m apart, set on stone foundations. (Roman forts only had one wall). Externally the fortlet was defended by one c6m wide ditch. (Roman forts invariably had four ditches, unless the external ditch functioned as a harbour). The east and west walls contained gate towers which extended forward of the walls. At each corner of the fortlet, c6m square towers had been set out from the walls, giving full views down the walls, with a narrow stone wall passage connecting to the main structure. (Roman towers are within the walls). Narrow wicket gate in each tower, accessed the fort and externally. This positioning of towers, external to the walls, is a typical Chinese construction. One identical Chinese fort, also with external towers, in Akaroa, New Zealand, was surveyed with both magnetic anomaly and ground radar, with 100% confirmation. Two similar turreted forts and one external turreted, double walled town, where located on the Isle of Arran, Scotland.

Within the fortlet, a scan only located the foundations of the eight barracks, (Roman forts would have contained, praetorium (officer`s quarters) and principea (offices). The barrack blocks contained one paved and eight unpaved rooms, each c4m square. This is standard for a Chinese barrack block. (Roman barracks contain ten unpaved and one paved room, for an officer). Roman double roomed barrack blocks in fort`s are very rare, only a few being located out of 100 forts surveyed in Cumbria. None have been noted in the 100 odd forts surveyed in Scotland and the Isles. A man made extension platform c 25m x 30m on the SE face of the fortlet contained the foundations of a walled granary compound, NY 47710-62343. The foundations of the granaries were of standard Roman

design, with buttresses and suspended floors. As on the Isle of Arran, it appears that the Romans constructed the basic infrastructure, ie harbours, canals and granaries, BUT, not the forts and domestic buildings. The granaries were supplied from the now reeded harbour, immediately south of the site. The harbour was accessed by the canalised Laversdale Beck. The fort`s c10m x 6m toilet block NY47677-62419 was situated down hill from the western gateway. The absence of wash rooms for the town or fort, provided further evidence of the site`s constructor being Chinese. I have surveyed over 200 Roman sites in the UK, every toilet block had an adjacent wash room, but on the 50 odd Chinese sites surveyed in New Zealand, Nova Scotia and Arran, only toilet blocks were provided.

CHINESE TOWN`S DEFENCES and SERVICES..

The footpath, east from Laversdale, flanks the inner dyke of the town, the outer dyke has been mainly ploughed out, only a short length of it`s raised base is recognisable, but the foundations are still in place and easily located by a magnetic anomaly scan. The town was defended by double ditches, with two rings of earth dykes. The cores of the dykes consist of sandstone brick sized blocks laid in herringbone pattern (ie stacked). The dykes were constructed on none overlapping foundations, (Roman foundations overlap their dykes) with multi turrets at regular intervals. These defences are far stronger that the normal Roman town defences of one 6m ditch and a single rammed earth dyke on overlapping cobble stone base. A scan along the outer dyke`s foundations, located the foundations of three square turrets (T1,T2 & T3) and two gatehouses (G1 & G2). Each turret protruded by c 6m from the outer dyke and linked into the inner dyke. From Laversdale, eastwards along the footpath, these where positioned at (T1)47768-62496 and (T2) 47808-62486, this turret gave access via a single postern gate to a 10m x 6m toilet block, without a wash place, some 25m down the slope 47795-62418. One gatehouse (G1) 47831-62476 accessed the harbour via a visible raised road, without ditches. All Roman Roads had ditches, none of the Chinese roads located in New Zealand and Nova Scotia had ditches. One section of the dyke`s herringbone laid, sandstone block core was exposed alongside the (G1) gatehouse (47926-6246). The third turret (T3) was situated at 47908-62454. A further gatehouse, (G2) 48002-62438, with a single gateway, but two gates front and rear, gave access to a prominent, man made platform c 100m x 25m orientated N-S. This is immediately south of the footpath. A scan over this area located the foundations of a walled granary compound c 80m x 20m. NY 47991-62374. The compound contained Roman designed granaries, identified by their buttresses and suspended floors. The town`s toilets are adjacent to the granary compound. The granaries had been supplied from the adjacent harbour via paved paths, whose raised

bases are still clearly visible. The area`s eastern flank was also defended by a dyke with a herringbone laid stone core. The exposed core is visible (48028-62409) from the field, on the "eastern" side of the dyke. ie From Laversdale go through three gates along the footpath, turn right, the exposed eastern face of the dyke`s core is c 20m along the dyke.

LOCAL FRONTIER DEFENCES. "THE PETTERIL LINE".

Penrith, a Roman walled town, was also linked to Hadrian`s Wall on the Solway by a double vallum, defended to the west by a 6m wide ditch. I have called this north –south 30 mile (49km) long defensive line "The Petteril Line", it is of identical construction to

the vallum flanking Hadrian`s Wall. The Petteril Line ran from Boustead Hill, a Roman fort (But oddly not listed) on Hadrian`s Solway defences, skirting Carlisle to the west. The defence line ran through what is now Dalston, the visible Bishop`s Dykes within the riverside park, formed part of "The Petteril Line". A good site to view this section of the dykes as the footpath alongside the River Caldew runs on the top of one dyke. The defence line crossed Carlisle race course, to near Junction 42 (M6), then ran south via Scalesceugh Fort, flanking the eastern bank of the River Petteril to Penrith. The foundations of one gatehouse c 30m x 20m (50958-30729) are adjacent to the private houses near Larkfield, (adjacent to the railway) access to the visible wall to Gillwilly fort`s harbour is adjacent.

One interesting fortlet or gateway on the Petteril line is best viewed from the motorway M6, southward lane, 1.5km south of Junction 41. The site is nameless, 503-319, but is constructed on the westward slope, requiring considerable work to form the platform.

The Roman forts at Wreay, Bottom Farm (S of Wreay), Tarn Wood Fort, Voreda, (Castlesteads Farm), Plumpton, Stonybeck and Gilwilly, appear to have been part of this vallum defence. Rivet & Smith, (The Place Names of Roman Britain), mentions Plumpton Wall, as a site for Voreda fort. Gough in his 14th Cent map identifies this Wall (The Petteril Line) near Heskett by a crenellated line. A further line of forts are visible on the line of the M6 between Penrith and Carlisle, one wonders if these formed the first defensive line, prior to the construction of the "Petteril Line", akin to the building stages of the Roman northern defences, culminating in the construction of Hadrian`s Wall, in this case moving eastwards, instead of northwards.. The remains of the "Petteril Line" can be viewed adjacent to the western side of the wall flanking the A6 between Penrith and Stonybeck Fort (Jnct 41). The man made mound of the defence line is very apparent between Stonybeck Public House and Kitchenhill Bridge. NY50157-34847. A good view of the man made mound of the Petteril Line can also be obtained, especially after sillaging, from the first layby (with a mesh fence) just north of Stoneybeck Public House. Presumably the Petteril line formed a westward bulge near Kitchenhill Bridge, to defend the Voreda canal by Stoneybeck Fort, before returning back to the line nearer to the A6 eg NY50157-34847 where it can be seen crossing the Plumpton Head to Catterlen Road northwards..

An excellent section of this defence line can also be viewed from the beckside footpath at Thornby -Stoneleigh, (2890-5240), NW of Dalston. At this point the bases of the dykes

can be seen running northwards to Bousteads Hill (fort) and the Solway defences. From Bousteads Fort, sections of the defences can also be seen running north to the Solway`s multi ditched defences. From Penrith, the defensive line continues southwards via Shap, towards Kendal and probably Lancaster. Whilst further surveying is required, it appears that at some time the Romans walled Cumbria from England, as they did with Severus`s Dyke, now called Offas Dyke, which walled off Wales from England..

LOCAL FRONTIER DEFENCES. "THE ANGELUS LINE"

I have called the defensive line which ran from Penrith West, to Pooley Bridge, returning

via Clifton Dykes to the River Eden, just down stream from Temple Sowerby, "The Angelus Line". It is approximately 18mile (30km) long. The Line`s construction was of the standard Roman parallel dykes design. The dykes were formed from rammed earth, or in some sections stone, on an overlapping cobble stone base, forming an "Inverted T".(C&W 1994 Excavations on Hadrian`s Wall) pg 38). In front of the outer dyke was a 6m wide ditch. This defensive line ran from Penrith, via Skirsgill, Yanwath, Red Hills to Stainton Wood and the R.Eamont. One gatehouse is visible alongside the footpath between Red Hills and the River Eamont, the gatehouse now has an animal enclosure built into it. The ditches of another fort in the fortified line are also visible on the limestone bluff overlooking the remains of the"only" foot bridge over the R.Eamont 501-275. Don't forget to have a look at the lovely example of a Roman canal at the base of the bluff. The fortifications then flanked Sockbridge Roman Town 43acre (18ha). From Sockbridge Town, a secondary pair of dykes ran to Tirril, a suburb of Sockbridge Roman Town. One gatehouse platform can be seen in the field opposite Wordsworth House, another alongside Ladybeck Bridge, the seat is on top of the gatehouse. The whale like platform of the main gatehouse to the suburbia can be seen opposite the Queens Head, Tirril. From Tirril, this secondary defence ran to Askham and joined the return defences from High Winder to Clifton, Clifton Dykes and the R.Eden.

From Sockbridge, the frontier ran westwards via Thorpe to Barton Church. The church was built on the platform of a manned guardhouse which controlled access into the fortified area. Nearby Kirkbarrow Farm is built over a Roman settlement, the barrow is actually the man made platform (Flanking the road to the church), constructed to house the settlement`s forum, bath house, temple etc, the foundations are still in place. On the north bank of the nearby River Eamont is probably the best remaining examples of Roman bridge abutments in Cumbria. The bridges were constructed to carry the two legs of a double carriageway, part of the High Street`s northern infrastructure.

The frontier defences locked into the nearby Church Farm fort and ran SE across the Tirril to Pooley Bridge Road, to Low Brow Farm, crossing immediately south of the farm via a prominent bank. Adjacent to this bank was a small settlement, it`s inhabitants employed on exploiting the nearby iron ore. Adjcent Mains Farm was part of the city of Ullswater, the foundationsof the 70m x 10m insula (houses) are still in place. Then the defensive line ran via Barton Hall and the fort at it`s rear, tying into the walls defending Ullswater City, (not covered in this publication). At Pooley Bridge, clearly visible from the footpath at the rear of the Sun Public House, are the bases of two parallel dykes

running down to the River Eamont from Bower Bank, the site of a Roman fort. The defence line returned eastwards via High Winder and Old Askham, a 14acre (6ha) Roman town /settlement. Then the frontier ran eastwards via Yanwath Woodhouse and the River Lowther to Clifton Church, which was based on a gatehouse of the defensive line. Clifton Hall was based on a Roman fortlet. The defensive line (dykes) ran via Clifton Dykes, hence the name. Old Clifton was the site of a 43acre (18ha) Roman town. The line then returned via Salter Hill, north of Cliburn, the site of further iron ore exploitation, to the River Eden near Julian Bower farm, nearly opposite Temple Sowerby. At this point the Carlisle floods in 2005 washed away a considerable amount of the river bank and

exposed the stonework of the end of the Angelus defensive wall.

The Angelus defensive line, complete with gatehouses and small forts, was constructed to defend a large number of ore exploitation sites. The small towns within the walls had their economies totally dependent on this mineral exploitation. One major discovery was made when Sockbridge Mill house, based on a Roman granary, was being extended. The excavation into the adjacent hillside sectioned a complete granary block, and a lovely cross section of a huge rubble drain running under the site. The granary had been constructed to supply the area including Sockbridge Town. The excavation at the back of the mill house was highlighted by a 150mm deep black line running c 25m across the complete face, evidence that the granaries it had been deliberately fired when the Romans left the area. Two other separate excavations I made, one into a granary and one into a barrack block, both alongside Ullswater, but a mile apart, also showed that they had been fired. It would appear that that the Romans adopted a scorched earth policy when leaving, one can understand on army sites, but as the Sockbridge Mill site was civilian, one wonders why. The Sockbridge riverside Roman harbour site with it`s man made navigation island, was used as a fish farm for many years. The riverside locks, situated in private land, which controlled access to the harbour are still in position. On the Stainton side of the River Eamont, opposite Sockbridge Mill, accessed by a footpath, is a good example of an excavated Roman toilet block, 4965-2765, the remains of a fort are above.l above. The toilet block is now used for watering cattle. An identical unit can be seen at Vindolanda, incorrectly labelled as a water tank. A similar harbour and man made navigation island, still stone lined, is visible at Red Hills (Due to it`s iron deposits) on the north bank of the river opposite Yanwath Hall. Note the lineof the harbour bye pass canal at the northern side of the infilled harbour.This served a small iron ore exploitation site. A fort platform lies immediately to the north, its ramparts can be seen from the footpath.

Whilst it is outside the scope of this booklet, the same Carlisle floods that exposed the end stonework of the Angelus Line on the banks of the River Eden, also exposed the timbers of some ancient log boats in the bed of the River Eden near Rockcliffe. I was somewhat disappointed to receive the carbon dating result from the Scottish Universities Joint laboratories (SUERC). I had hoped for a date within the Roman occupation period, but instead at c7,000 year old, they appear to be some of the oldest log boats ever located. These horrendous floods also flushed off the debris from the foundations of Hadrian`s Wall on the west bank of the R.Eden, at Rockcliffe. Fortuitously I noted these when I was surveying for the real route of the Roman depth defences North of, not through, Carlisle.

ROMAN TRANSPORTATION HIGHWAYS. THE RIVERS AND CANALS.

In virtually every British river there are examples of Roman "uphill" linear navigation islands and integral locks, all logged by the superb cartographers of the Ordnance Survey. By following the course of a river and observing the linear, tear shaped, linear islands on a large scale map, one can actually follow the Roman occupation of Britain. By travelling along the rivers, combined with studying the geology of the regions for the presence of metallic ores, one is automatically led to the Roman operational sites.

Sadly, the uninformed, invariably cite expensive Roman river locks or dams, as fish traps constructed by monks. Yet fishermen the world over use cheap woven fences as fish traps. Recently, an article was published by the C&WA&A (V11, 2007) that suggested that the Roman locks and dam in the River Eden at Wetheral.(South of Carlisle) were fish traps, constructed by the local monks. This claim was made despite the existence of the original dated deeds recording the land transfers from the local Norman Barons to the newly formed Priory. The deeds also stated that the "New" Priory must maintain the dam and locks (fishery), complete proof that the river infrastructure existed "before" the Priory. At Wetheral the R.Eden still contains the highly visible evidence of the Roman`s immense engineering operations. These consist of the 12" sq (300mm) holes, cut in the sand stone bed to form locks for the stone navigational dam. The 500m long linear navigation island (C& A call it an Eyot, A small river islet) is still in place in the centre of the river. The west bank of the river has been modified to form a relief spill channel for the dam. The much rebuilt Roman navigation locks are still position adjacent to the eastern bank of the river. Cut into the cliff face overlooking the navigational dam is the well recorded Roman inscription. "Maximus commanded that this be written, Constructed by the 20th Legion etc". Caracalla, son of Severus, took the title Germanicus Maximus c213AD. (C&WA&A Trans 1989, pg 88). That the Emperor commanded the Wetheral inscription to be written, is proof of the importance of the work and of course the presence of the 20th Legion. Which is also attested by the inscriptions on the altar found in Carlisle Castle. C&WA&A1989, pg 86 line 10. My letter to the C&WA&A Society enclosing a copy of my Wetheral survey published seven years previously by the Matterdale Historical & Archaeological Society`s Year Book (2,000), was not acknowledged.

THE COMMERCIAL REALITY BEHIND the INVASION of BRITAIN & IRELAND.

Prior to the Roman invasion of Britain, it was well known that Britain contained vast quantities of metallic ores, such as copper, iron and lead, some with silver inclusions and in some areas of Wales and Scotland, gold. Cornwall and Dartmoor`s tin deposits, vital for alloying with copper to manufacture bronze, had been exploited by the Minoans and Phoenicians, the sites of their ore exploitation are invariably marked by stone circles. The purpose of the Roman invasion of Britain was to access this wealth of metallic ores, vital for construction work within the Roman Empire and for overseas barter trade. From Chinese records, we know that in cAD78, Roman Emperor Vespasian, due to a shortage of iron, banned it`s export. Around AD79 it is claimed that the Romans invaded Scotland and at some time later, Ireland, presumably to make up that deficiency of metallic ores.

The actual date when the Romans invaded Ireland is not known. My own surveys in Ireland, yet to be published, located a line of forts from Dublin to Galway Bay. By shear chance my wife and I stayed at three campsites each contained man made Roman fort platforms, one still had ramparts of stone over 2m high, another the visible foundations of the granary compound walls and it`s harbour walls nearby. The Rivers Boyne and Shannon contained evidence of navigation by the use of linear islands, a method used by both the Chinese and Romans. In 1996 a large Roman fort was located at Drumanagh, near Dublin. Needless to say, die hard Irish politicians refused to accept its presence. We were not overcome, was their cry. More historians with a preferred version of history.

The Romans or their sub contractors, exploited all of Britain`s metallic ores, including gold in Wales, Scotland and most likely in Ireland, where recent surveys have also located sizable gold deposits. I have located Roman ore exploration sites furthest point south, Cornwall, to Sutherland in the north of Scotland, west to Mull, Arran, Lewis etc and the Aran Island of Innismore, Galway Bay, Ireland and east to the Moray Firth. My research has also shown that the Romans brought in their Chinese trading partners, with their legendary expertise in locating and working metallic ores. Significant evidence of this partnership, including one gold exploitation site, has been located on the Isle of Arran, Scotland. See (Bell`s "Arran`s Roman Legacy and their Chinese Miners". Whilst many will smile at the thought of Chinese operating in Scotland. There are many records including those of DNA, that prove the presence of the Chinese fleets in the Atlantic. A parallel, well documented case of employing miners from overseas, is when in the 16th century, Queen Elizabeth 1st brought in German miners to search for silver and copper and operate the smelters. Miners with these skills were not available in Britain. One of their skills was the use of rods (Magnetic anomaly surveying) to record the magnetic anomaly created by the presence of ore seams in the country rock. Georgious Agricola`s "De Re Metallica", a 1550 German Miner`s handbook, translated from the Latin by H.C.Hoover, is the definitive book on ancient mining. The manual devotes a complete chapter to the subject of locating ores. Probably the Chinese who have left evidence of their operations on the Isle of Arran, had operated from Cape Breton Island. (See Paul Chiasson`s An Island with Seven Cities). At some periods in the past the NW and NE Passages, the fast routes to China, were ice free. Climate change is not new. The Hudson Bay company`s magazine Beaver recently reported the existence of finding a narrow navigable passage some 200mile south of the present North West Pasage. This presumably slightly warmer passage, ran alongside Melville Peninsula. Interestingly the magazine also reported Dolmens had been found along this peninsula, normally Dolmens are only associated with European folk. Apparently the locals are called Christos, possibly originating from Christians fleeing persecution. Many stone bases to support upturned wintering boats, have also been located along the passages of the North West.

My recent research had also indicated that the Chinese could well have anticipated the Panama canal by many years, by canalising one of the rivers which links the Pacific with Lake Nicaragua. It was known that the Rio San Juan from Lake Nicaragua to the Caribbean, was navigable. The Spanish constructed a fort near the head of the Rio San Juan to protect the lake from attack up the river. Lord Nelson, when a young frigate

captain, was involved with the capture of this fort. The original atlas used at that period (a copy is held in the British Library) was examined by Col Blashford Snell, it actually shows an open stretch of water linking Lake Nicaragua and the Pacific. A later royal cartographer denied the existence of this canal shown on "A Chart of the Environs of Jamaica" by Thomas Kichen (1774). A joint 1421- Scientific Exploration Society expedition led by Col John Blashford Snell, carried out a survey over the 12mile Isthmus between Lake Nicaragua and the Pacific in January 2010. This survey showed that the area between the heads of the Rivers Brito, (Pacific) and Las Lajas Bridge, (Lake Nicaragua) flooded in the rainy season and created a mass of water. This area of water probably gave early cartographers the impression that it was a navigable opening between

the Pacific and Lake Nicaargua. Col Blashford- Snell`s survey located evidence of dams and locks at the base of the dry rivers / canals. One telling piece of evidence was finding a piece of rock with a cut out for a lock gate and on the other edge of the rock, was a lovely example of butterfly jointing. This joint cut into adjacnt rocks on a lock or dam, enabled an iron bonding strip fashioned with butterfly ends to fit into the corresponding cut outs and be bonded into place with molten lead. This was a standard technique of ancient canal builders and further proof of a canal having been constructed to link the Pacific with the Caribbean. Also known was the existence of a large, sunken, ancient harbour in the Bahamas at Bimini. Many stone anchors have been located there and up the western coast of America, many located by veteran diver Bob Meistral and now displayed in several museums. Columbus`s many voyages to this region conveys the impression that he also thought there was a route to the Pacific from the Caribbean. Some readers may say what has this to do with Penrith and area. The evidence of planned ancient sea voyaging both in the Atlantic and the Pacific, assisted by short cut canals, is mounting. The latest evidence is such that the presence of Chinese around the UK in Roman times cannot be readily dismissed.

In 2005 Gavin Menzies, my wife and I were invited to survey Cape Breton Island by Paul Chiasson, a Canadian architect, who had located a Chinese religious site on Cape Dauphin. Our successful surveys of Chinese sites in New Zealand were already known to Paul. We located the rammed earth dykes of the site`s outer defences and the stonework of gateways of this 80sqkm amazing walled site. Also located were the lovely cut stone terraces of the residence of the senior official and carvings of animals which confirmed the existence of the Chinese temple. Ie The carvings were to the same design as those decorating Beijing`s Forbidden City. Several settlements, forts, ore exploitation sites, canals and stone harbours, were also located. The cut stone quays of one shore side harbour, designed to hold 47m x 11m junks, had by shear chance, just been excavated by a builder whilst preparing the foundations for a house. All evidence of confirmation of long term occupation. Needless to say, in spite of the Nova Scotian senior official being given an 80 page fully illustrated report of our surveys, the local archaeologists actually denied the existence of the site and it`s highly visible, cut stone terraces etc.

The negative report from the Canadian archaeologists highlights the problems of using inexperienced folk, to investigate complex sites totally outside their sphere of expertise. Ie A walled ancient Chinese site complete with canalisation of the local creeks, harbours,

aqueducts, rammed earth walls and temples. We ran the talk on the Cape Dauphin site to hundred of visitors at the Singapore Tourist Board`s 600th anniversary of the Chinese Admiral Zheng He`s first voyage and also at other venues, none queried the story the photographs told. Interestingly, the National Geographical Magazine surveyors used my survey coordinates to carry out their own verification aerial and on ground survey of the Cape Breton Island site. Whilst the magazine negotiated and sadly failed to obtain the publishing rights, their surveyors not only agreed with our survey, but added to it. Recently I have been approached by a Canadian TV company who propose to use our surveys and Paul Chiasson`s to make a documentary of the Cape Dauphin Chinese site.

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AMATEURS TALK ABOUT TACTICS BUT PROFESSIONALS STUDY LOGISTICS.
General R.H.Borrow. (Commandant US Marine Corps)

In Roman Britain, one can but assume a scenario. That as the easy to work deposits, such as Cullen and Portsoy on the Moray Firth, mentioned previously, became worked out. Then as other more difficult deposits, with long lines of communication to operate and defend, became very expensive to work, so presumably Rome started to look elsewhere for its supplies. We know from Chinese records that from 157BC there was extensive trading with the Romans, including the supply of iron to Rome. Chinese, Roman and Arab ships sailed up the Red Sea, then used the Pharaoh`s canal from the Gulf of Suez to the R.Nile and the Mediterranean. This canal was commenced by Pharoah Necho 695-595BC, rebuilt by the Romans and updated by several Caliphs between 642AD and 1337AD. This information was supplied by Gavin Menzies, further details can be found in his latest book 1434. It would appear that the Romans, with cheaper Chinese iron and other sources becoming available, combined with other demands for troops to deal with political pressures from Europe, withdrew from Scotland and maintained Hadrian`s Wall as their northern frontier. Thus Cumbria`s metallic deposits became even more valuable. To exploit NE Cumbria`s mineral wealth within a hostile environment, with a potentially restive population and overseas foes making hit and run raids, as the Vikings did much later, large defensive works had to be constructed and manned. The threat from overseas or norther raiders, is sustantiated by the strength of the Solway defences. To supply their inland operations the Romans had to construct deep sea harbours for their c 30m x 6m vessels, complete with warehouses and facilities for transferring their cargoes to the 10m x 3m craft used on the estuaries and the larger rivers. Then construct further inland harbour facilities ie Penrith and Keswick, upstream to transfer from the 10m x 3m craft to the smaller ones c 4m x 1m used on the shallower upper reaches of the rivers. As an illustration of the chain of local becks and rivers used as transportation highways. Alongside Ullswater`s eastern shores is Swarthbeck, navigated by the Romans to a nearby ore exploitation site. In Swarthbeck I located a piece of quartz with a very odd red streak in it. Divers of the Northern Archaeological Group helping me on a survey alongside the nearby 170m long Roman harbour wall, located further pieces of the coloured quartz, also Roman nails. I located further pieces of this red streaked quartz in the River Eamont alongside the swing bridge at Pooley Bridge Mill and another piece in the River Eden at Wetheral. Several geologists professed themselves baffled at the origin of the red streaked quartz. Finally, at one of my talks, Mr Davies Shiel, Cumbria`s most knowledgeable person regarding it`s ancient industries, identified the quartz as part of a

mill stone, originating from a quarry near Paris, the source of the best mill stones in Europe. Obviously the source of the Romans mill stones. Mr Davies Shiel turned out to be the son of my geography master, also a brilliant teacher. Life`s indeed a circle.

During my 2003 surveys in New Zealand I had located the remains of one wrecked Baochuans or “Super” junk arced across a cliff, the first to be found in the world and many buried under sand along the shores. These 100m -120m long x 50m beam junks, not unlike floating football pitches, were the largest wooden vessels in the world. Whilst it was generally thought that these junks returned to China to dock, I was convinced that such harbours had to have existed in New Zealand. Ancient ship operators away from

their home bases grounded their ships (careened) them to repair and clean the hulls. This was impossible with “Super” junks, their huge concrete lined hulls required careful supporting when grounded. My surveys in New Zealand had shown that the Chinese and Roman engineers had shared technology. I thought that if I could locate and learn the design and positioning of Roman deep sea harbours, I could then reverse this information to find “Super” junk harbours in New Zealand. Two years of surveying around northern British coasts ensued. Several Roman deep sea harbours were located and their designs and positioning analysed. We returned to New Zealand in 2006 and successfully located 23 of these harbours in various multiples, the largest harbour complex was designed to hold ten “Super” junks. One was found with exposed stonework, the others by magnetic anomaly. The site of the largest harbour was also confirmed by Tim Akers, using enhanced satellite imagery. A very satisfactory confirmation of my earlier surveys.

The largest Roman harbour I have located in Britain, is at Skinburness, just north of Silloth, West Cumbria.(SE corner NY12878-56276, NE corner 14351-56947) the harbour face runs at 60degrees from north. The stone walls of this deep sea harbour are buried in sand, but fully locatable at low water. The harbour is c1,600m long, parallel to the shore and c200m shore to sea. The harbour was accessed by 12 locks of two widths, 12m and 6m, ie 30m x 6m deep sea vessels and 10m x 4m estuary and river craft. The locks were c 70m long, so presumably could take two vessels at a time. At the end of each lock there was a single pier, 30m long leading out to the sea. A docking vessel would go alongside the pier and then could be hauled directly into the locks, regardless of wind or tide direction. A dam was constructed across Skinburness Creek to create a differential head. 14525-56914. This head fed a shoreside aqueduct which ran the full length of the harbour supplying water into each section. A shoreside depression drew my attention to the still running aqueduct. Some of the upper covers of the aqueduct have dropped into the duct, sand is dropping into the duct, being carried away by the running water and the sand loss is creating depressions on the shore line, eg 13620-56765. All the Roman harbours I have located; Portsoy, Cullen and Spey Bay (Moray Firth), Moels (Wirral), Cramond (Edinburgh), Spital, (Berwick upon Tweed), Treagh Beach (Isle of Lewis) and South Shields (1,300m x 70m) (NZ3350-6670 to 3700-6765) have been to the same design, but smaller in scale. Skinburness was the major deep sea harbour for Cumbria and western end of “The Wall” and South Shields (NE Coast), for the eastern end of “The Wall”. Theese two harbours were of course connected via a complete set of transportation highways formed from canalised rivers and pure, all weather, purpose built canals

flanking Hadrian`s Wall. Caerlaverock was the major port for Dumfriesshire and also served the River Nith and the huge fortress at Drumlanrig and the nearby gold and lead exploitation operations. As Caerlaverock harbour could only handle c10m x 3m vessels, it was probably served by Skinburness`s deep sea harbour. There is also evidence to suggest that Caerlaverock and Dumfries were linked into a north Solway coast defence system which connected into Hadrian`s Wall via Longtown and Newtown..

The Solway is notorious for it`s shifting sand banks and fast currents, making navigation difficult. So to byepass the Solway the Romans constructed several canals. One flanked the Solway coast to both supply the Roman coastal defences and link the small Roman

harbour, now called Port Carlisle, to Carlisle. The same problems of navigating the Solway problems generated the construction of a canal in the 19th cent. This ran on the Roman route, using the vallum`s dykes as it`s banks. The drained canal was later used as route for a railway. The other east- west Roman canal linked Skinburness harbour, via Kirkbride to Carlisle. A third north-south canal linked Bowness with Kirkbride. A fourth canal linked the Roman port of Silloth with the Kirkbride to Carlisle canal. All these canals were defended by flanking earth dykes set on stone foundations. The presence of these stone foundations and the flanking aqueducts of the canals, enable the complete routes of these canals and defences to be followed using magnetic anomaly, even when the dykes have been ploughed out and the canals backfilled.
Prior to the exploitation of the major metallic ore sites, it was necessary to establish communication lines, ie build roads, eg High Street, for fast troop movements and light cartage, signal stations, army barracks to house the guards and towns and settlements to house the workers. As this infrastructure was expanded, so too was the construction of their transportation highways, ie canalisation of the rivers. Both the Roman`s first industrial revolution and the British second industrial revolution, used water transport for their heavy goods. Some maintain that the Phoenicians were responsible for Britain`s first industrial revolution, but the scale of their ore exploitation operations and physical legacies, ie stone circles, pale into insignificance compared with the Roman legacies.

Penrith stands at the gateway to the north lakes, Ullswater, Derwent Water, Bassenthwaite, Hawswater and originally, the two small lakes at Thirlmere. (Before it was turned int a reservoir). In Roman times all these lakes were navigable and accessible from Penrith via canals and canalised rivers. Penrith itself was accessible from the Solway and Carlisle, either via the canalised Rivers Eden or Petteril. Derwent Water was also accessible from Penrith via the R.Eamont, then a canal via Stainton to Troutbeck and then via R.Glendermackin to Derwent Water. Thirlmere was accessible via a canalised beck through St John`s in the Vale. Near Penrith are the Rivers, Eamont, Lowther, Lyvennet and Leith, all canalised by the Romans, all run into the River Eden. Nearby, flanking the A6/M6 is the River Petteril and not far to the northwest, is the River Caldew. The Rivers Caldew and Petteril discharge into the River Eden at Carlisle, which flows to the Solway. Thus the Romans were provided with a wonderful network of rivers and lakes, which they proceeded to convert into transportation highways and link via canals.

The following are a few of the historical references to the Roman use of rivers and lakes

as their transportation highways. Caesar in his “The Conquest of Gaul” (France) in only ten years of fighting, said, in pursuit of the Gauls, we could not go far from the river, as that is how we were supplied. Tacitus wrote of General Corbulo re invading Germany, it was made much easier as the River Rhine had been modified (canalised) when the Roman had previously occupied the area. Tacitus also wrote of Germany, “We sailed on all their lakes”, alongside which they dwelled, as did the Romans on Ullswater and Windermere and the locals lived alongside the lakes. One Roman quayside at Swarthbeck, east shore of Ullswater, is 170m long, some stonework and several of the huge stone flags which paved it, are still in place. This quay served two adits cut into Raven Crag, these and Wet Sleddale`s are only Roman ones I have located, all the other ore exploitation

sites have been surface operations. At Ullswater, two major quays, parallel to the lake shore, indicates that the Romans controlled Ullswater`s level. Unlike all modern jetties which are at right angles to the shore. The remains of the Roman dam which controlled the lake`s outflow is still visible from the footpath between Pooley Bridge and Ullswater.

The eastern Roman quay on Ullswater`s shores is on private land and not accessible. However, a similar quay on the western shore is visible from the footpath. 4545-2340. This site is roughly half way between Pooley Bridge and Watermillock. This quay served the iron ore exploitation sites on the nearby Rumneys and Salmond plantations. A huge agger c20m wide, still visible, although now cut through by the modern road, linked the sites with the quayside. The footpath flanks the agger across the lakeside field, originally the agger accessed the quay by a ramp, now nearly all washed away. Half way along the footpath a cut to the shore is still clearly visible, this was a ladder lock for the canal which cut through the agger. The onshore harbour, lined with puddled clay, which the canal accessed, is now just an unusual shaped depression in the field to the west of the modern road. On the lakeside, still visible, are some of the large boulders which formed the Roman quayside. The nearest major Roman road linked Ambleside via the Struggle, Kirkstone Pass and Aira Force and Matterdale to the A66. This complete route was surveyed by Dr A.Richardson and Dr T.M.Allan, (C&WA&A Transactions 1990). Their work generated my own survey of the extension of the lakeside Roman Road from Aira Force to Soulby, part of the City of Ullswater.

Many of the Roman inland harbours sites are still visible, but they now exist as heavily reeded areas, as their puddled clay linings still hold water. A good example is the reeded area immediately north of Waterside Farm, Ullswater, this can be can be viewed from either the Howtown Road, or the lakeside footpath from Pooley Bridge. Another large reeded harbour can be viewed from the footpath, east of Keswick`s Theatre by the Lake. These large inland harbours, are reminders of the immense size of the Roman operations in Cumbria.

In addition to the still visible stonework of dams and canals, further proof of the existence of this immense spider`s web of canalised rivers has been recorded by the cartographers of the Ordnance Survey. To navigate the rivers, the Romans had to increase the level of the shallow sections of the rivers by using dams or weirs and then provide a method of passaging from section to setion. This was achieved by cutting out sections of the river

banks to form tear shaped, linear navigation islands in the rivers. Sometimes the noses of the linear islands such as those by Warwick upon Eden, were stiffened with logs. A set of locks where constructed between the navigation island and the bank. A weir was constructed across the river at an angle from the bank opposite to the linear island, to the nose of the island. The weir forced water into the locks. The locks enable vessels to either lift upstream or lower, down stream. In wider rivers, a multi island method was adopted, but the principle was the same. General Roy, a Hanovarian engineer, fortunately for posterity, with a penchant for recording Roman sites, sketched the Roman camp at Crackenthorpe (Kreigenthorpe) by Appleby and the adjacent multi navigation islands in the R.Eden. A mill owner later took advantage of these existing hydraulic improvements.

A colleague, Davy Davidson, alerted me to the existence of General Roy`s superb map and sketches of Scottish sites, which included the layout of the Roman town of Cullen, Moray Firth. This sparked off my survey of this remote site and resulted in my locating Cullen`s unexpected, but superb amphitheatre, hidden in a secluded valley.

PENRITH THE ROMAN CAPITAL OF THE NORTH.

In Roman times, Penrith, as now, was the geographic hub for the north of England and thus the logical seat of government, not Carlisle. Whilst historians tell us that Carlisle was the seat of government, Mike McCarthy and his team who excavated there for 20 years could find “NO” evidence to support the historian`s claims.(M.McCarthy pg 59 “Roman Carlisle and the Land of the Solway”. That is because all the evidence re Roman government is in, and around Penrith. To date, the sites of five trapezium shaped praetorium, the hall mark of a governor, have been located in the Penrith area. The Romans originally divided Britain into two provinces Britannia Superior and Britannia Inferior, later into four, Britannia Prima and Secunda, Maxima Caesariensis and Flavia and later still, even a fifth Valentia.(Rivet and Smith).

Whilst Penrith must have been part of a northern province, it is quite feasible that the northern governor, had several operational bases, frequent moves would also make assassination, always a problem with Roman governors, more difficult. In c350 years of occupation, as the economy and the taxes grew, presumably so did the size and number of their exotic residences. The Penrith area was the perfect place to site an operational control centre. It was far enough back from the northern frontiers, Hadrian`s Wall and the Solway, to be able to access it readily with support troops, but not close enough to be overrun in case of an unforeseen attack. It was the most suitable site to house possibly the largest army barracks and training camp in the country, akin to a modern day Catterick or Aldershot. The ramparts of this 600acre (250ha) fortress which ran from Carleton Hall Farm to Honeypot Farm, are still visible. From Penrith, troops could be speedily despatched to all points of the compass by the superb road systems, enabling them to deal with intruders. Their heavy equipment and supplies could also be rapidly transported by the canalised rivers. All of which fueled the growth of Penrith as the Roman northern capital. Brougham`s vicus could well have supported the 600acre (350ha) Carleton fortress. Brougham`s vicus was part excavated some 40 years ago and again in 2008 when United Utilities ran a trial excavation prior to running Hackthorpe`s sewage main though the area.

PUBLISHED EVIDENCE OF PENRITH`S ROMAN OCCUPATION.

The following is a summary of the published evidence of Penrith`s Roman occupation. Ie structures, the information re Roman roads is listed under Roads. Penrith and area, due to it`s proximity to the northern frontiers and a major source of metallic ores, probably had one of the largest concentration of Roman sites in Britain. The occupation of the area for probably 350 years, has left an amazing legacy of forts, fortified compounds, ore exploitation sites and evidence of river navigation. Sadly, few have been listed. Dr Graham Webster, "Roman Imperial Army" and the main excavator of Wroxeter, once a 20th Legion fortress, provided a fascinating clue. He stated that in the North West,

possibly Carlisle, there had to be a Legionary Fortress to house the 20th Legion between AD79 and AD 84, after they left Wroxeter. In the Penrith area, there are five large forts, all with visible ramparts, each contains 66 barrack blocks, which could house 5,280 men, a Legion, in tight winter quarters. Carleton Hall Farm was probably the most likely base for the 20th Legion. There is also the highly visible man made platform of the commander`s fort alongside the Carleton Hill farm fortress, east of the Hunter Hall school. The presence of the 20th Legion in Cumbria is confirmed by the inscription at Wetheral, this states that they constructed the adjacent dam and locks in the River Eden.

Roman records of the area are few, as are identifiable artefacts with names on them, coupled with the problems of actually identifying the sites referred to. The Antonine Itinerary, (See Rivet & Smith, "The Place Names of Roman Britain") a collection of routes of roads within the Roman Empire is of some local assistance, Iter 2 mentions Carlisle, Voreda, Kirby Thore and Brough. Iter 5 mentions Brough, Brougham and Carlisle, but, what at Brougham, a fort, town, the governor`s praetorium, or the fortress?.. Nobody knows. It certainly was not the fort that historians call Brougham, it is extremely doubtful that this fort, was even constructed at the time the Iters were published.

A very early, none Roman account, which refers to the Roman presence in the Penrith area, appeared in the Saxon Chronicle`s account 927AD. This recorded the meeting of the English Kings at Eamont Bridge, (A6), "A junction of great Roman Roads". Michael Wood`s "In Search of the Dark Ages". The Rev Stukley (Itinerarum Curiosum 1725) also recorded the Roman navigation island (by Bleach Green) on the nearby R.Eamont and the Gyrus, (Roman cavalry training ring) alongside the Lowther Bridge, indicative of the presence of Roman army recruits. Thos Pennant in 1769, also noted these constructions. D.W.Dymond (1891 C&WA&A Transactions) noted the Lower Arthur`s Table and the ramparts of the High Table (Roman fort) which overlook Arthur`s Lower Table. This is a small early Roman fort, not a Henge, modified by the Saxons. Wm Atkinson (1883 C&WA&A Transactions), also recorded the ditches and ramparts which are now better known as the Crescent, by the North Lakes Hotel (Junct 40 M6), the site of two Roman forts and a trapezium shaped fortress, one of the residences of the area`s Roman governor.

Walker`s "History of Penrith", (1858), records the repair of Penrith`s northern earth dykes in 1601 after raiding, presumably by Reivers. The base of a section of this Roman dyke, is still visible in Macadam Way. The "History of Penrith" by Turner (1893) records

a long scattered village called Plumpton Wall after the Roman Wall, the word wall is no longer used, just Plumpton. The wall referred to was the Petteril Line which ran from Boustead Hill, Solway, to Penrith. Only the foundations of this wall now exist. This wall is also shown on Gough`s 14th cent map. Turner also commented on the remains of buildings on either side of the River Petteril at Voreda, the Roman fort at Castlesteads Farm. The ancient foundations on Castlesteads eastern farm are frequently referred to as Old Penrith. Research into Penrith`s history has shown that it has never moved from it`s present position in over 2,000 years, so the term Old Penrith is erroneous. Nor is there any reference to the mystic medieval settlement claimed for the Southend car park site as claimed by the excavators. It was a Roman suburb of Penrith`s Roman town.

More modern accounts of local Roman sites, mainly Ordnance Survey references, list the following; The Roman tileries at Scalesceugh (A6 just north of Hesket). The visible small Roman fort at Brougham (4th cent) with visible ramparts, the forts alongside or near the A6 at Wreay (Park House) and Plumpton (Voreda) (Castlesteads Farm) and a nearby un-named fortlet (500-360) alongside the A6 near Boggle Hall. The Plumpton Wall (Rivet & Smith). (refers to the north -south Petteril Defence Line). The Roman road flanking the A6, cutting across Beacon Edge and across Frenchfield, (previously a Roman Harbour site, now a sports field), near Brougham. Sceugh Farm`s probable metal working operations (54-30). The Brougham marching camp and the part excavations of a Roman cemetery. The details of these cemetery excavations were recently published, some 40 odd years after the survey.

Sadly the information regarding the hurried excavations at Brougham`s huge vicus (large village) does not appear to be readily available. A local eye witness, Dr Anthony Leeming of Skirsgill, who as a student took part in the rescue of artefacts from the immense Brougham vicus, stated that the site flanked the old A66 for over half a mile to near the Lady Clifford monument. The vicus site was bulldozed in the 1960`s by Cumbria County Council during the road widening for the A66, sadly without time being available for a full archaeological survey. Some of the interesting finds located during United Utilities recent excavations across a section of this vicus, prior to installing a sewage main for Hackthorpe, were re recently exhibited at Brougham Hall.

Author`s Comments. It is difficult to relate a settlement (vicus) of the size described by those who assisted in it`s excavation, plus the section near the Brougham cross roads (c 600m x 200m at it`s widest down to 80m, say 21acres (9ha) in line with the fort`s western ditches, with the size of the adjacent fort at the cross roads, which is now claimed to be Penrith`s only Roman fort. The modern comparison would be the highly unlikely construction by Marks and Spencer of a major store in Tirril, purely to serve it`s 340 inhabitants. A vicus of the size quoted by Dr Leeming and as evidenced by the recent excavations, would have certainly been more in keeping with the requirements of a 600acre (250ha) fortress with a garrison of several thousand troops. My survey of this small fort, south of the Castle, located the foundations of the six barrack (double roomed) blocks, indicating a garrison of 480. The existence of double rooms indicates a very late construction date, probably 4th century, far later than the vicus.

ROADS. HIGH STREET, (THE SWIFT WAY.)

The area`s best known road is High Street. Thanks to the Reverend F.W. Ragg c 1890, who supplied the translation of William de Lancaster, the last Baron of Kendal transference of hunting rights in c 1227 to his half brother Rodger, we have the earliest record of High Street and use as a property boundary. The Great Road, (ad magnum viam) which comes from Brethstrett, down by Barton Church. A section of High Street ran east of Barton Church, by April Cottage, to Stainton. The Reverend Ragg in c1908 also translated the use of a great road called Stayngate, in Wet Sleddale as a property boundary when land was being transferred to the Shap Abbey in 1257, from Sir Patrick to the Abbey of Val Magdelene (Shap). Both references are ex the C&WA&A

Transactions. The great road "Stayngate", ran from Penrith, via Lowther to Shap and linked to the Roman Road, now A6, south of Shap`s Blue granite quarry.

Dr Paul Hindle`s survey of High Street was the first to appreciate that there are two southerly access routes, one from Dubs Road via Applethwaite Common, which also serviced the adjacent ore exploitation operations and northwards via Yoke and the SW one from Windermere and Troutbeck which met with the Yoke route north of Froswick. However this survey, did not appreciate that the Romans constructed a row of forts at each high level east- west crossing junction, nor that High Street was actually a double carriageway with c 5m carriageways and a central c 4m wide unpaved strip for cavalry. Jim and Judy Andrews, Roman Road specialists, have surveyed the double carriage route of High Street, south of Dubs Road and reservoir, on it`s way to Lancaster. In late 2011 I finally discovered the sites of two Governor`s trapezium shaped praetorium, SD4010 7545 and 40350-98700 and a Roman town at Windermere, west of Troutbeck Bridge, the site is partially overbuilt by the school and swimming pool. The existence of this 20ha (48acre) town (SD40135-00075) explained the need for the construction of this extremely expensive road construction between Penrith and Windermere.

The first Roman road my wife and I surveyed was the route from White Moss, Loadpot Via Helton Dale to Lowther Bridge, Lowther Roman town, then Penrith. Also recently discovered is a further Roman double carriageway, this runs from a junction between Loadpot and Arthur`s Pike, northwards downhill, via an ore exploitation site, to Mossy Beck. The road then turned southwards, flanking the beck, then bridged the beck, and ran eastward to Helton, the bridge abutments are still visible. The large boulders utilised for the bridge abutments were recycled from a nearby, previously unknown 50m diameter stone circle. (49465-211309). (See Bell`s Stone Circles, Avenues, Temples and Souterrains, Moor Divock). (Cumbria Library) This double carriageway road runs to Helton and Lowther. From by the bridge over Mossy Beck a visible agger (spur) ran past Scalegate (Farm) to connect into the Lowther Bridge, Helton Dale – Loadpot road. Gate means way or road in Cumbrian, another pointer to the Roman Roads existence.

High Street also flanked and served several large ore exploitation operations, from Dubs Road 4235-0340, near Troutbeck (Nr Ambleside), to the largest on the north side of Loadpot.4585-1880. The Loadpot site contains smelter ramps and lower down the eastern face, the site of a fort, workers compound and a mini vicus terraced into the hill side. On

the eastern side of Loadpot`s hilltop, a huge spring, now Dodd`s Beck, was diverted to feed water down a canal on the north face to the Roman smelter sites. The water was used to drive the smelter water wheels, which in turn drove the bellows used to supply the smelters`s combustion air and feed head water to the canals. The routes of the canals can be easily followed along the reed lined depressions. Sadly, archaeologists not trained in Roman navigational engineering, frequently regard the depressions of the line of Roman canals as hollow ways and thus evidence of roads. The late Raymond Selkirk, Britain`s most respected Roman maritime archaeologist, used to ask archaeologists quoting hollow ways as roads, if that was a fact, where are the sunken ways which linked London

to the north?. A simple scan across such depressions will determine it`s origins and function. If it has stone walls and flanking aqueducts, it was a Roman canal.

At the northern end of the "High Street" mountain range, is a hamlet called Celleron, (celer means swift in Latin), presumably High Street`s real name should be the "Swift Way". Further north, lower down the hill, on the Eamont Bridge to Pooley Bridge Road are Tirril and Sockbridge, originally two medieval villages, now one, both formed from a Roman town, whose core covers 43acres (18ha), with two suburbs. This town`s economy was part based on working Thorpe`s iron rich glacial deposits ex the Borrowdale volcanics. The worked terraces can be seen from the road (dead end) to Sockbridge Mill. Look west from the track after the last house on the left (Barn End). Note also the canal depression. Walk c50m down the lane to the large gateway on the riverside of the lane. Note the size of the wall`s stonework, this is all that remains of the defensive wall which enclosed the Roman forum (shopping centre) for the Sockbridge Roman town. The foundations of the forum, basilica (offices) are in the adjacent small field. The small theatre, now infilled, was on the eastern side. The site was served from the R.Eamont.

On the line of High Street, just south west of Tirril, I located the largest Romano Celtic temple site I have located in the UK, c45m x 40m, with it`s 6msq aqueduct fed immersion bath. The temple had been constructed within an ancient stone circle, itself built on a 2m high artificial platform, built at the northern end of a stone lined avenue. The major stones of the circle and avenue have long gone, but their packing stones still remain and are readily detectable by a magnetic anomaly survey. Presumably the later temple served the users of this major north- south highway. Those giving thanks for a safe journey and those asking divine help for a safe transit of High Street. Some while ago I also traced the 800m long remains of the Moor Divock end of the Shap stone avenue. The well known Cop Stone is probably the avenue`s last remaining standing stone. To my surprise the avenue ended in an amazing 417m x 100m ditched and originally walled site, with a 400m long x c10m -20m wide souterrain, still in parts 2m deep. The site contained the foundations of a Romano Celtic temple and even underground grain storage bins.This appears to be the only underground habitation ever located in Cumbria, possibly inhabited before, during and after, the Roman occupation. Roman smelters are nearby. (See T.C.Bell`s "Summaries of the latest surveys on Moor Divock", Penrith Library). Moor Divock is the site of Ullswater City`s Roman cemetery.

THE EIGHT ROUTES OF HIGH STREET at THE NORTHERN END, TIRRIL.
(There may be yet more to locate).

Route (1) From Loadpot a double carriageway ran via Arthur`s Pike, the eastern fields of Waterside Farm, Park Foot and Pooley Bridge and the Roman City of Ullswater.

Route (2) Via double carriageways, from Loadpot, via Moor Divock to Winder Hall and Celleron, here it split.
One double carriageway ran just east of Kirkbarrow Farm and Barton Church, serving a Roman settlement, bridged the River Eamont, leaving the finest bridge abutment in

Cumbria, then served the ore exploitation operations at Dalemain and Stainton,. Finally it linked to the major Penrith to Keswick road, now the route of the A66.

Route (3). From Celleron one route ran via the prominent ridge of the Tirril –Barton Road by April Cottage into Thorpe Farm, then split into two double carriage roads, Route (3) and Route (4).

Route 3 Crossed the River. Eamont near the old sewage plant through Stainton, servicing the ore exploitation sites and connected to the Penrithy-Keswick Road,

Route (4) Crossed the River Eamont, the bridge abutments are visible, and northwards via Hoghouse Hill, Newbiggin (Stainton), connecting with the Penrith to Greystoke Road. From Celleron the double carriageway ran to Tirril, serving the local ore exploitation sites, the agger can be seen at the rear of the Tirril Village Hall, Rome`s Picadilly Circus.

Route (5) From Tirril Village Hall a double carriageway ran southwards to service the riverside metallic ore exploitation sites at Lowther, the adjacent Roman town and a army fortress, the site also contained a governors`s trapezium shaped praetorium. South of the Lowther castle is a 500m x c50m wide man made depression, firstly quarried or iron ore,. this is the site of a Roman chariot race track, the only one located in Britain,,the foundations of the central spine and starting gate are still in place.. The site is a mirror image of Rome`s Circus Maximus, complete with the foundations of viewing stands. Over the years Rome`s Circus Maximus was enlarged from 500m to 600m. Britain.

Route (6) This is the only route shown in the first Ordnance survey of the area. The route was from Celleron, Tirril Village Hall, Yanwath Hall, bridging the River Yanwath, servicing the Redhills ore exploitation site, crossed the now A66, crossed the Greystoke road by the pillar, then via the ridge to Newton Reigny, bridged the River Pettreil east of the Sun Hotel, then west of Hutton John to Unthank, there it linked to the Penrith to Wigton Road.

Route (7 and 8) From Tirril Hall a double carriageway ran eastwards, (alongside the footpath for first 100m) via Glendowlin, servicing the iron ore operations, then Route (7) split from Route (8) by the railway line at Glendowlin then swung northwards to service the Yanwath fortress. The modern road from Eamont Bridge to Yanwath swings around

the end of the fort`s 240m long, eastward facing ramparts. The Roman road crossed the River Eamont at Southwaite, a considerable quantity of the river piers are still visible in the river. The M6 and A66 junctions destroyed the road beteen Skirsgil and the North Lakes Hotel. The double carriageway, serviced Penrith`s Roman town and ran south of Ullswater College, flanking Thacka Beck canal and the harbour behind the Penrith Hospital, then via London Road to meet up with the Brougham to Carlisle road by the Beacon Edge cemetery, then vianthe A6 northwards to Carlisle.

Route (8) This is the continuation of Route (7) From Glendowlin, it ran eastwards, servicing Yanwath Woodhouse and the adjacent ore exploitation site to Lowther Bridge

and Brougham. Near the Lowther Bridge, one section of the double carriageway crossed both the R.Lowther and the River Eamont, the stonework of the bridge abutments are still visible, also the ramparts of an adjacent fort. Dr Alan Richardson, well known for his work on Roman Roads and surveying, noted these bridge abutments from an aerial survey. Ray Selkirk`s "Piercebridge Formulae" was " For every Roman bridge, there was a fort". Yet further proof of Ray`s formulae. At this point on the northern bank of the River Lowther alongside the stonework of the bridge abutment, can be seen the stonework of the Roman harbour running in echelon to the river. From this harbour craft accessed the canal across the Westmorland Holme to the River Eamont. This canal linked the Frenchfield and Swimming Pool Field harbours and the Penrith`s 250ha (600acre) Roman fortress to the River Lowther.

Route (8) From the River Eamont continued NE through what is now the Penrith Rugby Ground and connected with the north section of the Brougham via Beacon Edge Road to Carlisle via what is now the A6. From Beacon Edge, by Roundoaks Hotel, a Roman road ran eastwards, crossing the River Eden at Langwathby, then ran via Melmerby, a walled Roman ore exploitation settlement, then linked with a road from Kirkoswald and Renwick to cross the Pennines at Hartsop, servicing the ore exploitation sites en route.

From Brougham, a major Roman Road ran southwards to Orton and Tebay. A further road has been located running from Penrith southwards, across the bottom of Carleton Heights road by Frame`s surgery to Sceugh Farm, into the Carleton Hall Farm-Honeypot Fortress. This exited the fortress, crossing the R.Eamont near Barrackbank wood to link into the Stainmore road, near the track to Nine Kirks. All part of a massive web of Roman roads, all interfacing with Penrith`s 600acre (250ha) fortress. Whilst listing the Roman roads around Yanwath, it is vital that the pioneering work of the the late Dr T. Martin Allan, probably Cumbria`s most dedicated road surveyor, is recognised. In my early days, his surveys were my inspiration and standard works of reference. Martin Allan pioneered and published "The Roman Route across the Northern Lake District". This road ran from Lowther Bridge via Keswick to the West Coast..

HIGH STREET, A SUMMARY

High Street was designed as a critical part of a vast, integrated transport system comprising roads, canals, harbours, defensive forts, en route accomadation and storage

warehousing and granaries. The system included direct road links between the Roman towns of Windermere, Sockbridge and Penrith and Ullswater City, all of the vast number of metallic ore exploitation sites, the Solway defences, Hadrian`s Wall, the two major inland harbours at Carlisle and the deep sea harbours at Skinburness and Silloth.

THE MAJOR ROAD NORTH, LANCASTER TO PENRITH

Pre the construction of the M6, the major road north from Lancaster to Penrith, was the A6, which ran via High Bridge, Shap and Eamont Bridge. This road, with some minor route modifications, followed the original route of the Roman Road, which in turn flanked the Roman western defences (dykes) to near Lancaster. For totally unknown

reasons, Roman historians never mention this route, although it is less exposed then the Orton route and was also used by Charles Edward Stuart when fleeing northwards after his 1747 invasion of England. Proof of the use of this major route, north by the Romans, now flanked by theA6, is the existence of two beautifully preserved forts at High Bridge, Borrowdale and the line of forts, from Thrimby, Shapbeckgate Fort 12ha (28 acres), one of the largest forts in Cumbria and Hackthorpe Fort, plus the ore exploitation operations at Thrimby. The Saxon Chronicle, also stated “Eamont Bridge, the meeting place of Roman roads”. The Romans frequently constructed lodging barracks at major cross roads. At Kemplay, towering over Eamont Bridge, is such a site, now scheduled for a Fire Station. 52300-29075. This walled site c 200m x 100m contains the foundations of a c40m sq fortlet, the bridge guard. Six barrack blocks provided accomodation for troops on the move, a walled granary stocked their supplies. The infrastructure also included a bathhouse, toilet block and a temple. The site`s harbour, now just a large depression in the middle of the field was connected by a still visible canal at the southern fields edge, via ladder locks to the R.Eamont. A large ramp at the rear of Penrith`s hospital also provided a connection between the site and Thacka Beck harbour.

TIRRIL VILLAGE HALL To LOWTHER and MARTINDALE.

A section of double carriageway ran from the rear of Tirril Village Hall, (the best site to view a section of High Street), southwards to Lowther. From the same road hub, a minor 3m wide road ran westwards to High Winder and Roe Head, flanking Ullswater on the “Pipe Track”, below and west of Arthur`s Pike) to Howtown. This road was in use for many centuries after the Romans left and served the farms along the route, now they are all served from the Howtown lakeside.

From Howtown a number of roads fanned out. The road connecting Fusedale and it`s nearby ore workings to High Street, is probably the best preserved section of Roman Road in the area. Two roads ran up to High Street from Howtown, one via what is now the bridleway, then from the back of Martindale Church under Steel Knotts and Pikeawassa and Browthwaite Crag, all ore exploitation areas, to High Street, just south of Loadpot. Another road ran southwards between the now zig zags to Martindale, with a spur which climbed to the shoulder on Place Fell, scene of heavy quarrying. One section of the road carries on up the Boredale Hause, then eastwards via Angle Tarn and the Knott to High Street, and westwards to Patterdale, the Kirkstone etc. There is a great deal of evidence of Roman ore exploitation in this area, including on Hallin Fell. Also a lovely

signal tower and fortlet on Kailpot Crag.4335-2045. The cut outs for the signal tower are still visible in the lakeside igneous dyke. The round holes in the dyke are the result of geologist`s coring. There are vast numbers of ancient miner`s paths still visible on the faces of the fells overlooking Ullswater. These are best viewed when highlighted by winter`s snow from the Watermillock area. Moor Divock and area`s eastern ore exploitation sites were accessed by Ladybeck, a canal, from the R.Eamont via Tirril and the western side from the many becks which ran into Ullswater. Aik Beck, visible southwards from the Mains Farm crossroads, near Pooley Bridge, with the many visible remains of dams, was a major transportation highway to the High Street area.

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TIRRIL, THE NORTHERN HUB OF HIGH STREET. (The SWIFT WAY).

In the Roman occupation, from Tirril it was possible to despatch troops by road to any part of the Cumbrian coast or Hadrian`s Wall. Roman walled barracks specifically constructed to house troops on the march (as per modern motels) have been located at Tirril, (cohort 450men), nearby Thorpe (two cohorts), Soulby, near Ullswater (two cohorts), Beacon Edge (cohort).These sites were supplied with a full of range of toilets, wash houses, temples and granaries. One 100m sq fort adjacent to the Thorpe motel and overlooking Barton Church, was discovered when the field under which it lay, was ploughed after lying fallow for 60 years. Pieces of intact clay pipework ex the washhouses and a quantity of pottery shards were found, also evidence of metal working.

PENRITH, THE HUB OF THE MAJOR ROMAN ROADS IN THE NORTH WEST.

Penrith was accessed from Carlisle via what is now the A6. From the east, over the Pennines by a junction with Maiden Way, then via Melmerby, a walled Roman mining settlement. (Survey lodged with the Village Hall authorities). From the south east, by the road on a line of the present A66 ex Stainmore over the Pennines from the east coast. From the south west by High Street (ex Skirsgill, Tirril and Celleron). From the south, via Brougham, Low Borrow Bridge (Tebay) Orton etc (P.Ross`s surveys). From Eamont Bridge, and on the line of the A6 from Shap, High Borrow Bridge and Kendal. South from Lowther to Shap Abbey area and southwards. From the west (Keswick and west coast) now the line of the A66, (Dr Martin Allen`s, “The Roman Route across the Northern Lake District”). Also from the west, via Greystoke. From Ambleside via the Kirkstone Pass to Soulby and the A66, or via Pooley Bridge and Tirril. (Dr A.Richardson & Dr M.Allen)

ROADS AROUND FRENCHFIELD`S ROMAN HARBOUR, now a SPORTS FIELD.

The reason for the existence of this large flat site, the only one in the area, was due to the Romans having bulldozed it flat to construct their major harbour. The spoil was used to form the platforms of the adjacent forts. The author assisted the investigating archaeologist during the construction of the road for the sports pavilion, identifying the positions of the harbour, Roman roads and canals by the use of magnetic anomaly. The major road mapped by Ordnance Survey, ran from Beacon Edge by Hunter Hall School, crossed Frenchfield Harbour, now a sports field, where it was joined by two minor roads from Carleton Hall Farm Fort, whose ramparts tower over the site. The road then firstly ran to Brougham, then southwards to Low Borrow Bridge, Tebay and southwards,

(surveyed by P.Ross Civil Engineer, 1919 C&WA&A XX Transactions). The author`s survey also located a junction at the Hunter Hall School site. (Frenchfield).

Many years ago pre the construction of the sports site, I contacted Eden District Council (EDC) and offered to locate and mark, for free, the positions of all the Roman aqueducts and canals which still access Frenchfield, this would have enabled them to be blocked off. I also described a simple method of cutting through the puddled clay lining of the harbour walls using a heavy mole plough. This work would have reduced the amount of free water flowing into the site and also allowed what water was there to freely drain and not be retained by the harbour walls, which are water proofed with puddled clay. I was

accused by EDC of wishing to carry out archaeological experiments and was assured that they had taken advice re the site. As probably the only marine engineer in Cumbria, if not in the north of the UK, who had studied Roman harbour design, obviously my knowledge was of no value. Little wonder that Frenchfield, the only flat field in the area, is still a very wet site, as the Romans designed it to be, for a harbour.

ROMAN ROADS SOUTH & WEST FROM FRENCHFIELD HARBOUR.

From Frenchfield, the Roman road ran southwards, crossing the River Eamont, and the area now used as a sewage plant, the known Roman cemeteries flank this road. The road ran via Barrackwood, (564-294) site of a Roman fort, where it was joined by a road from Sceugh Farm, part of the Roman Fortress site. The road then followed the line of the present A66 to Stainmore and Scotch Corner. From Barrackwood Fort, a Roman road flanked the present track to Nine Kirks Church (56-30). Another small Roman Fort 560-298, on Church Bank site overlooks the church. A Roman road then ran eastwards, flanking the south side of the River Eamont, at some point, possibly Udford, there was a bridge. Near Udford is the confluence of the Rivers Eamont and Eden.

ROMAN ROADS NORTH, FROM FRENCHFIELD HARBOUR.

From the Hunter Hall junction (Originally Frenchfield Farm) a major road ran north westerly through Penrith to Beacon Hill and Stoneybeck, then flanked the A6 northwards to Carlisle. A section of this road, correctly marked by the Ordnance Survey, was recently exposed at Beacon Hill, Penrith, prior to the extension of the cemetery. It took the team of archaeologists two weeks to locate and expose the road. I visited the site to view the exposed road surface and took the opportunity to demonstrate to the senior archaeologist the technique of magnetic anomaly surveys. To my surprise, I was told this that method was unknown to them. Using this method a small field of this size, could be scanned very accurately in twenty minutes. Running through this field was also the depression that marked the route of the Voreda canal which linked Voreda Fort (Plumpton), via the rear of Sparkenhoe (Alongside the cemetery), via Cold Springs, to the Carleton- Honey Pot Fortress. The Roman Road ex Eamont Bridge (A6) which linked with the Penrith leg of High Street, also ran through this field, but other than for the sections by the walls, it has been ploughed out.

ROMAN CANAL DESIGN.

The stone walls of Roman canals were bedded in puddled clay, this both sealed the walls and gave them flexibility. These canals also incorporated a unique biological oxygen

demand water control and make up system. The canals were flanked on both sides by aqueducts. These flanking aqueducts were also fed at 18m intervals, by18m long aqueducts construted at right angles to the canal. These short aqueducts, filled with stones acted as field drains. The side aqueducts connected alternately every 18m to a further aqueduct, bedded in puddled clay at the base of the canal. The clay also sealed the base of the canal. This system had two functions. Firstly it made up the water losses from leakage, evaporation and the flanking aqueducts transported the water to the canal`s locks. Secondly the design also provided a biological oxygen demand control system, by feeding oxygen rich water to the base of the base of the canal and bubbling it into the water. The system prevented weed growth which could impede the barges and also

catered for the oxygen demand created by the discharge of raw sewage etc, into the canals. At major locks the water supply was augmented from water storage pounds, topped up from local sources. The presence of the flanking aqueducts and their 90 degree feeders, creates a unique magnetic anomaly signal enabling a Roman canal to be both identified and traced even when backfilled. I once sent an article describing the design of Roman canals to an archaeological magazine, thinking that it would aid archaeologists understanding of canals. I was told that my article was too technical for archaeologists.

ROMAN CANALS LINKING THE RIVERS EDEN AND PETTERIL.

The mention of Roman canals linking the Rivers Eden and Petteril invariably brings the reply, if they exist, why have they not been found before?. To locate Roman canals, one firstly requires an understanding of Roman engineering and canal design. Anybody with such training and experience could have located these canals. Sadly, even today, 26 years after the publication of Raymond Selkirk`s book “On the Trail of the Legions”, a superb treatise on the Roman use of water for transportation highways, many archaeologists still do not comprehend how the Romans actually operated. Hence not recognising the canals.

Most folk who live around Penrith at some time use the A6 between the Roman Fort of Voreda (Castlesteads Farm, Plumpton) and the Veterinary Laboratory Agency, (by the Low Plains turn off). In this section of road there are three deep dips, heading north from Plumpton. These are at Galleygill Bridge, Knowe Farm and Bull Head Farm. The Romans excavated these huge valleys to run their 6m wide canals through. Each canal connected the Rivers Eden and Petteril. Whilst both rivers functioned as transportation highways, in winter, the River Petteril would have been navigable for the majority of the winter, unlike the River Eden. In winter the River Eden becomes extremely swollen due to the large number of rivers which discharge into it, ie Lowther, Eamont, Leith, Lyvenet all of which drain huge catchment areas, ie Eden Valley, Ullswater area , High Street etc.

As this publication is primarily a record of Penrith`s Roman Heritage, and a background to the Roman operations in the north of Britain, only the section from Wreay southwards has been included. In this section the routes of seven canals which linked the Rivers Eden and Petteril have been identified.

LISTING THE CANALS LINKING the Rivers EDEN and PETTERIL from the NORTH.

STONEY WATH FARM. (East of Wreay) Canal linking the Rivers Eden & Petteril
By Stoney Wath farm 3km north of High Hesket, the routes of two canals c 300m apart, run roughly east west.46649-48869. 46693-48992, these can both be seen from the modern road. The canal alongside Stoney Wath Farm also served the adjacent fort 46693-48992 and possibly the other canal served the ramparted structure at Stand End. NY472-488. It appears that the two canals combined into one and crossed the A6, to join the R.Petteril at 448-494. Nearby is Scalesceugh, the site of a large Roman pottery. Possibly these canals transported clay from a local deposit. Yet to be located. To the east, at some point near High Strand Plantation, the two canals appear to have merged into one, now called Dry Beck. At possibly 504-476, it split again into two canals, both ladder locking

down the River Eden. The northerly canal runs via Drybeck Farm, 515-479 just 2km north of Armathwaite to the River Eden. The ramparts of a small fort can be seen 510-478 immediately south of the junction. The fort`s small Romano Celtic temple 5100-5095 is in the slightly raised unfenced patch at the north side of the junction. The circular route passing Dry Beck farm to the River Eden is worth taking (slowly). To the west of the road can be seen the ramparts of the fort on which Low House sits, to the right, in the middle of the river are the remains of a Roman linear navigation island.

North of Armathwaite is Lockhills Farm 250m south of the farm (and c550m south of the Dry Beck junction), a man made cut can be seen in the stone walled bank on the west side of the road, 5070-5744, this cut carried the bifurcation of the Dry Beck Canal to the River Eden via ladder locks. The ramparts of a small fort can also be seen on the east side of the modern road immediately to the north of Lockhills Farm 509-4760, this fort extends under the modern road.

AIKETGATE, HIGH HESKET CANAL. Linking the Rivers Eden & Petteril.
Gate signifies ancient way, this is conformed by the 5m wide walled Roman road detected running north from Tarn Wood in the direction of Aiketgate. From the R.Eden by Mill Farm 502-454 1km south of Armathwaite and west of the railway bridge, one canal appears to have split into two canals. This is the route of the northerly canal. The canal depression can be seen on the southern side of the Armathwaite to Aiketgate Road by the railway bridge. 49868-45292. A scan showed the canal crossed the road between Hazeldene and Hazel Cottage, water still flows under the road to the visible canal. The footpath by Hazel Cottage runs north from the Aiketgate road, it crosses three canals, the ditch flanking the road was a 2m wide canal, the flanking aqueducts are still in place. The major 6m canal now backfilled ran inside the gate. Looking up the horse field, the depression of the canal can still be seen. Following the footpath gently upwards, the adjacent cut to the west, and the one flanking the path were both canals. An adjacent fenced off depression with a dyked up bank to it`s downside, gives the impression that it has been a small harbour 49764-45382. The rest of the route can be followed NW by the V contours on the OS map. Crossing the B road at 47331-46678 Aiketgate and Low Hesket, note ramparts of small fort at 47529-46774 overlooking the very clear canal cut. The canal then ran to the south of the road flanking Barrock Fell and Greatbarrock Wood. At the bend of the road immediately south of Greatbarrock Wood, 46848-68050, the ramparts of a fort / quarrier`s abode are visible, north of the road and the very flat field,

south of the road is also worthy of further surveys. The presence of Roman sites and the detour of the canal is indicative of quarrying, possibly for metallic ores as well as. Further surveying in this area could be rewarding. Excavations in 1979 at a site SW of Aiketgate, 485-463, locally called Castle Hewen, located pottery ex the nearby Roman Scalesceugh kilns. Whilst no evidence of the castle exists, it appears that the small castle was constructed on a small Roman fort site which overlooked the nearby Roman canal..

The canal then flanked the east side of the A6, running between the foundations of the two dykes of the Petteril North- South defence line. It`s route was located by a scan at 46002-47381 and at 45657-48007 (Ivy Cottage). The canal then crossed the A6 road by

Ivy Cottage, then ran anticlockwise around the 117m high hill, marked as a Roman signal tower on OS map. Crossing the Causeway House to Wreay Road at 45280-4840, the cut of the canal can be seen in the field north of the road. The canal route is to the R.Petteril, just south of Wreay Hall.

TARN WADLING / HIGH HESKET CANAL Linking the Rivers Eden and Petteril. The outline of the ramparts of a lozenge shaped fort 504-458, are visible alongside the west bank of the R.Eden, just south of Armathwaite Castle. On the east bank of the River Eden, alongside the footpath and opposite the mill, a Roman spill dam with beautifully cut stone blocks linked by iron clamps, infills the gap left between the igneous dyke and the east bank. The paved spill way is below the wall. Roman pottery has been located in the spillway.

From Mill Farm 502-452, 1km south of Armathwaite, by the R.Eden the canal split into two canals. This is the route of the southern canal. The canal can be seen at the T junction of the Armathwaite and Lazonby road, by Coombe Eden 4970-4500. From here the canal ran westerly by Vicarage Farm, a little way up from the farm, the deep cut of the canal can be seen south of the modern road 49176-45108 accessed from the T junction by Yew Tree Farm (Kennels). This road leads to Tarn Wood..

Tarn Wood to Tarn Wadling, section. The Tarn appears to have been a Roman c100acre harbour, now drained for agricultural use. The Tarn was shown on Gough`s 14th cent map. The east – west canal, flanked by defensive walls, their foundations, still in position, ran immediately to the south of Tarn Wood 49084-44419. The Tarn Wood road runs northwards from the Armathwaite to the A6 road, the modern road overlies a 5m major Roman road which lines up with Aiketgate. This Roman road was walled, huge sandstone blocks of the wall can be seen on the eastern side of the modern road. Tarn Wood, a private wood, flanks the western side of the road, the multi ditches of a Roman fort can be seen from the road. The fort is 250m long, so would probably be 150m 3.7ha (9acres) a large fort for Cumbria. One wonders if the wall and the fort formed part of the harbours defences. All Roman harbours were walled, all appeared to have guarding forts or fortlets.

The canal was next located running NW, as it crossed the modern road at 48030-44650, adjacent to the footpath, north of Old Town Farm. The edge of the harbour is shown by the c 0.5m deep depression some 20m in from the road. To the north of the line of the

canal and overlooking it, and the footpath, are the ramparts of a small Roman fort 48127-45285.

From the point where the footpath crosses the road, the canal contoured northwards around High Hesket, crossing the A6 by the Cross Keys to Southwaite Road at 4660-45250. It`s route being located by magnetic anomaly. At this point there is derelict stone barn. A scan alongside the walls located the stone buttresses, a further scan over the floor located the sub floor supports of the original suspended floor. Buttresses and suspended floors are the hall marks of Roman granaries. The barn had been rebuilt over the original Roman granary foundations. One wonders if there are any other foundations of Roman

buildings in the area. The contours indicate that the canal ran NNW to link to the River Petteril at Pyetmire wood

LOW PLAINS CANAL Linking the Rivers Eden and Petteril

3km south of Armathwaite, at the T junction by Barrowwood Farm, immediately east of the lake at Abbots Moss 51497-42906, spot height 120m, the excavation for the canal can be seen east of the wall. The map contours show the line of the canal ladder locking down the hillside angling NE past the railway tunnels to the River Eden. From the same 126m spot height, looking SE in the direction of the lake, it can be appreciated how much rock has been extracted to construct the canal. Presumably the lake at Abbot Moss was formed by quarrying. The canal was next located as it crossed the line of the road, east of the Eden Springs Factory, 50380-42068. The canal then crossed the line of Lazonby to A6 road, via a dip east of the houses 49728-40947, the raised section west of the houses marks the line of the canal`s flanking defensive wall. The canal then crossed the line of the A6 via a very pronounced dip NY49012-39968 alongside Bulls Head Farm. This is best appreciated on foot. Alongside the A6 footpath sign to Walls Nook, is the platform of a signal tower. From here the canal accessed the River Petteril via Plumpton Foot.

THE LAZONBY FELL CANAL. Linking the Rivers Petteril & Eden.

Heading north from Lazonby, on the Scarrows Lane Road, the depression of this canal can be seen at 53555-41183, east of the road, near the bend north of Cote Hill farm. Turning left (south), from this road 250m south, onto the Lazonby to Armathwaite road, park in the opening just past the wood 53391-40989. The large dip immediately south, is where the canal running E-W crossed the line of the modern road. 53406-40920. Alongside the wood can be seen the line of the raised base with residual stone of the original Roman canal defensive wall. This is the best example of the defensive walls of any of the canals that I have located to date. Little wonder that these huge defensive walls generated sufficient stonework to construct all the local field walls. The flatness of the field and the number of buttercups (water loving plants) suggests that this field contained a Roman harbour, lined with puddled clay. At the southern side of the field is a raised section defended by a dyke. The site is still littered with cut stone, this was the site of a Roman granary compound. 52015-39090. A small Roman fortlet must be nearby.

This canal ran over Lazonby Fell, as it is private land, the fell has not been surveyed. The odd contours highlighted by the Ordnance Survey map on the western side of the Fell,

around Whinneybank Plantation suggest that a great deal of quarrying has taken place, possibly iron ore was also extracted. The quarrying would explain the reason why a canal was constructed over Lazonby Fell. The canal was next located at the dip on the A6 immediately south of Knowe Farm. 49156-39431. Interestingly where the canal accessed the River Petteril, there is a Roman camp marked on the OS Map, one wonders if it housed the canal workers. The original McAlpine Fusiliers.

THE LAZONBY WAN FELL CANAL Linking the Rivers Eden and Petteril.
Upstream from the Lazonby swimming pool are the remains of a large Roman puddled clay harbour, now only visible as a reeded area. Adjacent are the remains of a spill dam

and it`s flanking dyke 55919-39697. The dam forced water into an adjacent harbour and a canal which flanked the River Eden, the canal depression is still visible. The surplus water was spilled back into the river downstream of the dam via the deflection dyke which ended at the river bank. The harbour was the collection harbour for the area, it was connected by canal, westwards to the River Petteril, so enabling either the Eden or Petteril routes to be used, dependant on weather, to transport goods to, or from, Carlisle.

An aerial survey c 920m south of the railway station clearly shows a large cutting 55127-38890. Best seen from the B6412 Lazonby-Great Salkeld road, 5500-3875. In this field was a small fortlet, presumably for the operators and guards of the ladder locks. The canal ran from Woodside, south of Lazonby, turned westward, locking up via Scatterbeck, a good viewing point (5525-3890). Then via Keld Farm, crossing the Lazonby –Plumpton road at the watershed, Bownrigg. Then the canal turned northward, contouring above Fell Gate Wood, with a branch canal running eastwards to Voreda Fort. The main canal continued northwards, swinging west at what is now Galleybridge on the A6 NY493-390, connecting into Voreda`s northern harbour and the River Petteril.

VOREDA FORT (493-384), CASTLESTEADS FARM, PLUMPTON. A6.
From this site canals (497383) linked the Rivers Petteril, Eden and Eamont.
The Roman fort site at Plumpton, north of Penrith, is notable for, what is “not” written about it, rather than “what is” written about it. The ramparts of this fort and the remains of the stonework of the eastern gateway and the very wide ditch suroumding the fort, can be clearly viewed from the A6. Just north of the fort, a layby on the eastern side of the A6 provides safe parking. This very wide ditch was actually the fort`s supply canal and formed a harbour. There are three known Cumbrian forts to this design, Voreda, (Plumpton), Brougham (Penrith) and Galava (Windermere). The fort`s canal / harbour was connected by ladder locks to the R.Petteril. The surveys of Voreda, never mention that it was primarily an iron ore exploitation site, with multiple forts constructed over the years of ocupation. Professor Shotter appears to be alone in questioning why a basic fort should be constructed so close to Penrith`s forts. Alongside the River Petteril is clear evidence of the iron ore exploitation operations, large sections of the banks have been excavated. Smelter ramps are still visible above the river bank. In the field to the west of the River Petteril, the Romans constructed large reservoirs, lined with stone, bedded in puddled clay, these are now infilled but detectable. These reservoirs (pounds) were fed

from a major spring at the north of the field. The water storage was required to drive the waterwheels which drove the bellows, these supplied the combustion air for the smelters.

The Petteril north –south defence line, split at Voreda, one section ran on each side of the site to guard it. A fort, (492-389) whose presence is never mentioned, lies at Galleybridge, 600m north of Voreda, it`s ramparts towers over the road to Low Grounds and Voreda`s northern harbour. There are two harbours on the west side of the A6, the northern one, alongside the road to Low Grounds, a smaller one, now just a sunken field, is immediately south of Castlesteads Farm. Nearby are the buried foundations of an early ridge fort, with it`s distinctive whale like shape, presumably the first fort on the site. On the east of the A6, the depressions of two large harbours can be seen, one north and one

south of the farm buildings. East of these harbours are the buried foundations of walled barrack blocks, probably these housed the workers on the site. South of the eastern harbour, alongside the A6, the ramparts of a large fort and it`s missile bastions are still visible. A small fort, not visible from the road, SE of the harbours, probably housed the harbour guard.

THE VOREDA CANAL, with it`s links to the Rivers Petteril, Eden and Eamont.. Voreda`s northern harbour, 492-388, adjacent to the R.Petteril, also served the Lazonby / R.Eden canal. To construct Galleygill Bridge over the A6, it was necessary to culvert the canal and infill the cut. Voreda`s eastern harbours 495-385 & 495- 383 were also connected by a canal to the Lazonby canal. The major Voreda canal ran from the harbours, southwards, flanking the present A6 to the small fortlet 50-36 near Boggle Hall, then ran down hill via ladder locks (across the A6). From the farm entrance at the Plumpton Head A6 turnoff to Catterlen Road 50228-34934, a small section of the excavation for the canal can be seen. The Petteril defence line ramp crosses the road west of the Plumpton Head farm at 50157. A section of the Voreda canal also served Stoneybeck`s fort 5035-3400, (West of Stoneybeck public house). This canal can be viewed from the Stoneybeck to Calthwaite Road, also from the road sign at junction of the A6 and B5305, south of the Stoneybeck roundabout. The canal was culverted and the cut for the canal infilled and banked up to support the B5305 to the M6. The depression marking the route of the canal can also be seen as it crosses, then parallels the Fair Hill road. The canals flanking aqueducts (See Roman canal design) still function as field drains, on its route to Beacon Edge. The canal depression (still visible) ran via Fair Hill to Beacon Edge crossing by the cemetery on it`s route to Cold Springs, crossing Carleton Hill by the garage. The canal then ran between two of the forts of the Penrith fortress (best viewed from Cowraike Quarry) crossing the A686 east of the Sceugh Farm entrance, then entering the Carleton Hall Farm– Honeypot Farm Fortress with a connection into Whins Pond, a large Roman harbour. The canal then ran via the Sceugh Farm byepass canal, marked on the OS map, and into the River Eamont. A Roman fort, with prominent ramparts, part of the main fortress, guarded this point. 5475-3000.

The MAIDENHILL CANAL Linked the Rivers Petteril and Eden.

At the top of Fair Hill, a spur of the Voreda canal ran eastwards, north of Penrith to the River Eden via a deep cutting at Maidenhill Farm (a Roman fort site 52-43). Alongside

the footpath I noted one of the canal`s flanking aqueducts had collapsed, this and other collapsed aqueducts, provided my first knowledge of Roman canal design. The canal route can be viewed from the footpath near the farm (519-329). From the farm the canal ladder locked down to near Cote Ghyll cottage at the bottom of Strawberry Hill, then via a suspected fort site, to the River Eden.

THE SELKIRK CANAL, WESTMORLAND HOLME LINKED the RIVERS LOWTHER and EAMONT. (528-287 to 533-291)

This short, but major canal and it`s small stone harbour alongside the River Lowther, was first noted by Ray Selkirk during an aerial survey. (see Selkirk`s "On the Trail of the Legions"). The harbour and canal were fed from the river via a dam, surplus water was

spilled via a still visible, 100m long canal back to the Lowther. A 80m x 40m fort situated by the harbour, guarded the harbour and it`s adjacent bridges which carried the major road from Lowther Bridge (A6) to Penrith. The presence of this fort is yet again further confirmation of Ray Selkirk`s Piercebridge Formulae, that every Roman major bridge was guarded by a fort. The sole purpose of the canal was to enable river traffic from the River Lowther to access the Swimming Pool Field harbour and boatbuilding operations and Frenchfield harbour, both served the 250ha (600acre) Penrith Fortress via the River Eamont. Although the River Lowther is a tributary of the River Eamont, the junction of the two rivers is downstream of the acess to the harbours which served the huge Carleton-Honey Pot Fortress.

I reported the presence of the habour and canal to the County Council archaeologist and offered a guided tour. The presence of both the harbour and canal were promptly denied. I was told "Only you, Mr Bell, know of a canal there". I commented that Ray Selkirk`s "On the Trail of the Legions", read by thousands, confirmed locating the canal from an aerial survey. I had merely carried out the ground survey. Presumably the County Council`s denial was, if they admitted to the canal`s existence, they had to admit the Roman use of Cumbria`s rivers, then the existence of Frenchfield Harbour and then Carleton Hall- Honeypot 600acre (250ha) Fortress. Plus the accuracy of a "None Professional`s" surveys. No Way. Recently I gave a talk to a local history society re the Roman methods of canalising river. Included were photographs of the the Selkirk canal and the ramparts of a section of Carleton Fortress, which the canal served. At the end of the talk the chairman came up to me and said with puzzlement, "How could possibly any archaeologist deny the presence of the hundreds of tonnes of cut stone and the Carleton fort`s prominent ramparts". My brief answer was, "Easily, only card carrying archaeologists can locate Roman remains". Some while ago I mentioned finding the Roman City of Ulswater to a university lecturer in Roman archaeology, he said, it could not possibly exist, if it had, it would have been found by an archaeologist. Sad.

The Selkirk Canal was the vital link which connected the River Lowther to the Penrith Fortress and it`s workshops. The River Lowther, a canalised transportation highway, served the Roman ore exploitation operations from Wet Sleddale to Askham and Lowther and the attendant military and civil sites including those at Lowther. Many years ago whilst surveying for the Lowther Estate I was surveying for the Roman Road from

Lowther to Shap and was led to Wet Sleddale. I noted that the river had been re aligned (Concrete barrels on river`s edge), so looked for the old dry course of the river, which had been navigated The dry river bed led me to a Roman fortlet sitting forlornly in the middle of the field. (east of the weather station). The fort, 5591-1213, c40m sq, still with prominent rampart and accessing aggers, guarded the entrance to Wet Sleddale. A survey by Lancaster University of Wet Sleddale, sadly did not include folk who understood Roman navigation, so they missed being led by the navigable river to the Roman fort. Again I was led by the river and a very clear byepass canal, to the rebuilt structure English Heritage call a Monk`s Deer Trap. Actually the site of a Roman combined fortlet and miner`s compound, as the one at Yanwath Woodhouse. The mine adit is nearby. This is only the second Roman adit I have noted, all the other Roman ore exploitation sites

have been surface workings.

EAMONT BRIDGE - THACKA BECK - CARLETON HALL FARM CANAL

A byepass canal was also constructed from the Eamont Bridge area, flanking the R.Eamont, to the Carleton Hall Farm area, this also had a spur to Thacka Beck (canal). The depression indicating the line of the canal is clearly visible. Mrs Jean Hodgson of Carleton Hall Farm first drew my attention to this canal depression and how it`s route was highlighted under flood conditions.. This canal also linked Thacka Beck, the Roman canal (now used as Penrith`s main drain) which runs through Penrith and connected the Rivers Petteril and Eamont. The Roman byepass canal which fed the Sceugh Farm (54-30), downstream of the Frenchfield Harbour site, is still marked on the OS map, the canal line, its stonework and locks are still clearly visible. The Sceugh Farm area is a listed site. It was very probably, the site of the foundry and armoury for the adjacent Roman fortress, The Roman smelter ramps are still visible, overlooking the river.

The THACKA BECK CANAL. Linked the Rivers Petteril and Eamont, through the centre of Penrith. See Harbour Section for Thacka Beck Harbour..

VOREDA CANAL, A SECTION FROM COLD SPRINGS TO CARLETON HILL
A FOOTPATH ROUTE ALONGSIDE A SECTION OF THE VOREDA CANAL.
Best viewed before it vanishes on the altar of development. (NY5300-2960)

This section of the Voreda canal flanks the footpath from Cold Springs to Carleton Hill Road, parallel to, but west and at a lower level than Beacon Edge. At the time of writing this area of Penrith`s green belt is still free from housing, though sadly threatened with a housing development. This 600m section of footpath, flanking several Roman sites, provides a superb and most unusual ideal viewing platform from which to view a section of a Roman transportation highway. From the footpath can be seen a signal tower platform, two Roman forts, the sites of canal side and hillside harbours, canal quays, a major harbour for the one of the adjacent Roman town`s suburbs, even aqueducts are exposed. After this walk, all will appreciate how the Romans used water, not roads to transport their goods. The existence of the Carleton Hall Farm / Honeypot Farm 600acre (250ha) Fortress, was the very reason this canal and the Selkirk canal across Westmorland Holme were constructed.

As the walk passes over many Roman aqueducts, several visible, the design of Roman aqueducts is best described. The section of an aqueduct is similar to a Mars Bar sideways, with a hole through it. The hole is the duct, the material on either side of the duct is backing, this can be rammed stones or puddled clay and stiffens the aqueduct. A resistivity or magnetic anomaly scan will locate the complete width of the structure, but only a magnetic anomaly scan will actually detect the reduced anomaly of the hollow duct, thus the actual width, but not the depth of the duct can be measured, without the excavation so beloved of archaeologists. A c4m wide duct of a major aqueduct will actually measure c11m wide over the flanking stonework. When excavated, the rammed stone backing could well be thought to be natural stones, whilst the puddled clay is very

evident. The stonework of the ducts was bedded in puddled clay, this both waterproofed the ducts and provided flexibility. Smaller drainage aqueducts often consist of a circle of stones bedded in puddled clay, with a corbelled arch with either a puddled clay backing or rammed stones. Similar aqueducts I excavated within the Carleton Fortress and designed as site drains, had a 0.200m (8") duct, but an overall measurement of 2.200m wide, (7`-0"). The design of Chinese aqueducts is identical, one wonders who taught who. In the following references to aqueducts, the first measurement is the duct width, the second is the overall width.

As this walk passes through so many exposed Roman aqueducts feeding the Voreda canal, an explanation of their design is repeated. Roman canal design incorporated flanking aqueducts, (collectors) with roughly every 18m, an 18m long aqueduct set at right angles to the canal, (field drains). The flanking aqueducts connected to an aqueduct at the base of the canal alternatively every 18m, this enabled oxygenated water to bubble up into the canal. This system was an early form of biological oxygen control. The input oxygen compensated for that absorbed by sewage ex the nearby housing and plant life. This system, unique to Roman canals, provides a very distinctive magnetic anomaly signal, which enables the canal`s constructor to be identified and its route, even when the canal has been backfilled.

WALKING a SECTION of the VOREDA CANAL. CARLETON TO COLD SPRINGS .Starting from the footpath accessed from Carleton Hill Road 532-303. The footpath runs northwards over a 5m wide NS Roman Road, to the right are the buried foundations of a Roman fort and granary compound, c 200m x 80m, covering virtually the complete field. The foundations of the toilet blocks 20m x 10m, are near the field entrance 53277-30280. Under the field to the left (west) lie the foundations of insulae, these domestic dwellings each 70m x 10m, housed the occupants of this suburb of Roman Penrith. The stile 5330-3055, is the junction of two footpaths. The canal now infilled at this point, ran EW, flanking the fence. Walking northwards up the footpath to Beacon Edge, immediately to the right and northwards to Beacon Edge, the raised area is the agger of the Roman road. It is most pronounced alongside Beacon Edge, at this point the Roman road linked to Beacon Edge Roman Road and via a staggered cross roads, links northwards via a 5m major road which ran past the entrance to Roundthorn Hotel to

Langwathby. To the west of the Carleton Hill footpath and flanking Beacon Edge are the ramparts 5335-2975 of a barracks for marching troops. The site covers 150m x 80m, the ramparts can be seen parallel to the Beacon Edge road, the westerly section of the ield contains the buried foundations of a large walled granary compound. The depression, with encircling visible ramparts lower down the hillside, was a harbour, accessed by ladder locks from the Voreda canal, which is culverted at this point.

Back to the stile and the footpath`s "T" junction alongside the line of the canal. 5330-3055. East of the stile, past the agger, a further raised section can be seen, this was the line of a 40m x 10m paved area, which formed a quayside to the canal. The depression in the eastern corner of the field was part of the harbour for the adjacent large fort. Adjacent to this point, a scan located a large aqueduct 53320-30522, c 4m wide (c11m overall),

this ran under the canal and supplied the large fort. The 2m wide aqueduct (6m total width) discharge from the fort`s toilet blocks was located at 53277-30280, this crossed Carleton Hill Road and runs down hill towards Frame`s veterinary surgery. The c4m wide (c11m overall) aqueduct ex the Carleton Hill Fort`s wells, was located crossing the Carleton Hill Road 53256-30269 south of the road bend, en route presumably to supply the wells at Carleton Heights Fort, only the southern ramparts of this fort are visible, the rest is under the Carleton Heights estate.

Back to the footpath "T" junction. 5330-3055 Walking westwards towards Cold Springs, near the corner of the field is a small fenced off area. This contains the discharge of a Roman aqueduct into the flanking aqueduct of the canal. Alongside the fenced off area by the hedge the ground is raised, the grass covers a paved area c 10m x 10m, this formed a quayside to the now culverted canal. Some 40m up the hillside from the fenced of area is a flat bottomed depression. 53178-30607 this is the site of the 20m x 10m wash place and toilet for the barracks (motel) designed to accommodate troops on the march. Magnetic anomaly scans located the existence of six aqueducts between the wooden stile and the stone wall. One at 53176-30576 is c3m wide with c 4m of stone (c11m overall), this was the water supply to the Roman suburb, it passes under the canal ie it was detected on both sides of the canal. The other 53170-30576 is c 2m wide (c 6m overall), this carried the toilet and washplace for the barracks, the site`s drains discharged into the canal.

Passing westwards though the field edge stile, one immediately sees the stone walled Voreda canal to the south of the path. The canal now part culverted, was originally 6m wide, again with flanking aqueducts (see design of Roman canals). As the canal contours across the face of the hill, the Roman had to build up the western lip (down hill side) of the canal. It is interesting to note that in 1891, George Neilson in his Per Lineam Valli, a survey of Hadrian`s Wall, also noted the upcast of the vallum`s lower lip and compared it with those of the Antonine Wall. My surveys have shown that both Hadrian`s Vallum and the Antonine wall are flanked by canals contouring on hill sides, so it is of little surprise that the lower lips of the canals were built up, otherwise the water would run over. George Neilson was a very observant lawyer.

In the field to the south of the canal a large depression, c 80m square, is visible, at the

time of this survey, the site was highlighted by a lovely crop of buttercups, lovers of wetlands. This depression was the harbour for the Roman suburb 5315-3040. An aqueduct 53145-30562, c 3m (c 11m overall) on either side fed the harbour. Roman harbours are usually c 1.8m deep and always lined with puddled clay, hence the area still holding water. The harbour was connected to the canal by two locks, 53113-30555 and 53087-30558, each capable of handling barges c 10m long and 3m beam. Turning area were provided at each lock entrance. The footpath is flanked by the remains of a cut sandstone wall. A scan up to the wall confirmed that it is based on an inverted "T" foundation which protrudes past the wall edge, thus proving it was the line of the original Roman harbour defence wall. From this point, a small raised platform can be seen on the upper part of the hillside (Beacon Edge), this was a Roman signal station 5315-3070. Continuing westwards, a scan detected one small canal top up aqueduct, 53128-30562,

followed by four more visible aqueducts running across the footpath, three small ones fed makeup water into the aqueduct flanking the canal 53100-30572, 53070-30576, 52991-30592 and the fourth larger one 52990-30586 with a 1.0m duct, appeared to be an overflow from a harbour, whose depression can be seen north (above) the footpath.

Between the harbour and Beacon Edge, the platform of a Roman fort is clearly visible. 52964-3075. A scan over the wet area of footpath at 52964-30595, indicated the stone sides of a 4m wide canal. This canal linked a further depression (harbour) above the footpath with the main EW canal and a heavily reeded area, originally a harbour on the south of main EW canal and footpath. At 52884-30611, a large aqueduct was detected by scan this was c 3m wide, (11m overall). This aqueduct was possibly designed to feed a section of the main Roman town of Penrith, now built over. At 52667-30584, a large reeded area indicated another Roman harbour. A scan detected a further c4m aqueduct (11m overall). Presumably the aqueduct fed both the canal and the harbour. Between the last two gates of the footpath and opposite "The Old Lodge", a scan over the area 52514-30535, indicated the presence of a Roman granary compound c 40m x 26m. The Roman canal from this point runs westwards, climbing via ladder locks to Beacon Edge. The canal`s banks can be seen in the gardens of the houses fronting Beacon Edge. The canal crossed what is now Becon Edge, running through the new cemetery extension, then passing at the back of Sparkenhoe, to Fair Hill and the R.Petteril, near Plumpton. Near the top of Fair Hill this canal had a connection to the Maidenhill canal to the R.Eden. Further views of the line of the Voreda canal and the northern forts within the Carleton Fortress can be obtained from Cowraike Quarry, the source of much of the stone for the Carleton fortress walls, now used for the walls of every local farm.

AQUEDUCTS THE ROMAN`S DEADLY LEGACY FOR DEVELOPERS.

The presence of Roman aqueducts under a proposed building site are potentially dangerous. It is critical for the source of the aqueduct to be located and it`s flow diverted to a nearby drainage system, then the aqueduct removed. Buildings constructed over Roman aqueducts, will ultimately settle and the wall`s crack as aqueduct collapses under the superimposed weight of the house. If the aqueduct is live, as many are, water issuing from the collapsed aqueduct could undermine the buildings foundations and result in structural failure. The structural faults in the walls of St Andrews Parish rooms at the

centre of Penrith are typical of the problems caused by building over Roman aqueducts. There are more modern examples in Penrith and area.

The following is a summary of the Roman sites visible and scanned east to west along the route of the Cold Springs to Carleton Hill and Beacon Edge footpaths.

CARLETON HEIGHTS ESTATE. CARLETON HILL. NORTH to BEACON EDGE
External to the eastern walls of Carleton Fortress are several Roman sites. At the present time, 2010, these sites are still under under threat from developers. The following sites have been reported to Cumbria County Council, who also maintain the list of registered historical sites and copied to Eden District Council.

Carleton Heights Roman Fort 5310-3020 (400m x 180m, 7.7ha, 17.2acres) is 90% over built by housing. It is also proposed to build over the remainder of the fort (east of the NS section of Carleton Hill Road.

Roman suburb of Penrith Town. Immediately north of Carleton Heights (Estate)Roman fort site, the field 5320-3040, bounded to the east and north by footpaths, was a suburb of Penrith`s Roman town. This site c 200m x 100m, contains the rubble foundations of a number of insulae, these 70m x 10m buildings each with ten unpaved rooms and one paved room are the civilian equivalent of military barracks. The buildings are spaced at c 10m intervals each way with gravel drains, soakaways between the buildings.

Carleton Hill Fort. 5330-3040. c200m x 80m. The Carleton Hill Road having accessed Carleton Heights turns 90degrees eastwards. The field immediately to the north of the road, with a footpath flanking it`s west fence, contains the foundations of a Roman fort and it`s large external granary compound.

Beacon Edge.5335-2975. Roman marchers “barracks” fortlet, granary compound and harbour. The fortlet contains the foundations of six barrack blocks, designed to hold 480men, a cohort. East of the fortlet, parallel to Beacon Edge, is a walled granary compound, the foundations of the granaries are in place. The fortlet and granary compound covered c 150m x 80m. Below the fortlet the depression of the puddled clay lined harbour is a prominent feature of the hillside. The harbour was connected to the NS canal by ladder locks.

Beacon Edge Signal Tower 5315-3070. Situated between Beacon Edge and the Cold Springs to Carleton Hill road footpath. Best viewed from footpath.

Beacon Edge Fort 52964-3075. Prominent fort platform and indented hillside harbours, Roman Canal. Situated South of Beacon Edge Road, flanking footpath Cold Springs to Carleton Hill Road. Best viewed from footpath.

Roman Canal. 5300-3040 Parallel and below Beacon Edge. At the northern edge of this field, there is a stile and water trough. A now culverted, Roman 6m wide canal flanked by

is aqueducts runs east- west, flanking the fence line. This canal linked the River Petteril from Voreda Fort (Plumpton) via Stonybeck Fort, Fair Hill, Beacon Edge, then into Carleton Fortress exiting to the River Eamont at Honeypot Farm. The depression of this canal is still visible for many sections of it`s length.

PENRITH`S MAJOR HARBOURS.

Eleven major Roman harbours have been located in the immediate area of Penrith. Many others exist locally, such as the arena at Lowther and the show ground at Dalemain. Every Roman fort and ore exploitation site had it`s own harbour. I am probably one of the few who has set out to deliberately excavate a Roman harbour. This harbour by Ullswater, was 1.8m deep and lined with puddled clay 100mm thick, the blue coloured clay was still flexible, but hardened after exposure to the air. The quays were built in

stone. Frequently they are just free standing earth banks, sealed with puddled clay.

Brougham Castle Harbour. 535-290. The area between Brougham Castle and the River Lowther was originally the bed of the River Lowther, the Romans moved the river northwards and converted the river bed to a harbour. A dyke stiffened with sandstone blocks, was constructed to retain the river in it`s new course. The foundations of the earlier and larger Brougham Roman fort c 14acres,(c6ha) are immediately south west of Brougham Castle, the castle was built on it`s granary compound. Pottery found in the castle`s moat (Roman canal) was used to “incorrectly” date the so called Brougham Fort (visible at the cross roads. The archaeologist who dated the small fort, had not realised that the pottery emanated from either the vicus which was served by this canal, or the older and much larger fort, which lay only a few metres to the west.

Christ Church. Drover`s Lane, Penrith.5135-3050. The depression of the harbour and the raised base of the town`s defensive wall are both visible. The purpose of the harbour was to supply the northern section of Penrith`s Roman town. The harbour was supplied from Thacka Beck canal, either from the Rivers Petteril or Eamont. The church was built on the site of one of the town`s granary compounds

Frenchfield Harbour. 538-293. The water for this harbour was supplied by constructing a dam across the R.Eamont, the arm of the dam and flanking spill dyke were continued up to the harbour area, their foundations are still visible in the river. A further dam`s anchor block is still in position outside the main entrance to Brougham Castle. (Noted in the castle`s description as having no known function). At Piercebridge, Yorkshire and Drumlanrig Castle, Dumfriesshire, (Scotland`s finest Roman site) identical dams and their spill dykes can still be seen. Several years ago, during a record draught the outlines of the Frenchfield harbours quays stood out clearly in the parched grass. My letter pointing this out to the public, was published by the Cumberland & Westmorland Herald.

Honey Pot Farm Harbours. 555-308. A section of the original Roman harbours is now used as a fishing pool (Whin`s Pond). One remaining section of the harbour`s sandstone defensive wall is still in position. West of the farm`s access road, the other half of the harbour is now a reeded bog, the raised base of this harbour `s defensive wall is still

visible. The origin of the pond is claimed to be the past owners of Eden Hall. But a magnetic anomaly survey located the pond`s feeder aqueduct of a the unique Roman design. The aqueduct flanked the farm`s approach road, presumably fed from a spring in the nearby Edenhall Fell. In 1598 victims of the plague where buried near the pond.

Gilwilly Fort Harbour. (5075-3075) This harbour served both Gilwilly Fort (immediately south of Melbourne House) and Penrith via Thacka Beck canal. The harbour site is scheduled to be used as an impound for Penrith`s flood defence. Thacka Beck canal also connected to the River Eamont via it`s own harbour at the rear of Penrith Hospital. The Gilwilly harbour area is still fully visible, including a raised area on which the granary compound was constructed, the foundations are still in place. The base course of the sandstone wall which connected the harbour defences to the Solway to Penrith, Petteril

defence line, is still visible on the town side.

Lazonby Harbour. (55655-39856) This harbour is situated on the east bank of the River Eden covered c 3ha (7.2acres) It is now infilled. The harbour access canals are still clearly visible. There is also a smaller harbour on the west bank of the R.Eden virtually opposite, the ends of the spill dam and dyke which forced the water into the harbour are still visible in the river bank.

Lowther Bridge Harbour, (5265-2820) served Brougham Hall Forts. The site is now used as a car park for Penrith`s Agricultural Show, hence the bumpy ride known to all visitors..

Swimming Pool Field Harbours. (Carleton Hall Farm). NY534-293.The depressions of the sections of the Roman harbour are clearly visible. Also visible are the remains of the waterwheel channels of Clifford`s 16th cent Brougham iron works. Interestingly, whilst the iron works accounts are very detailed, (R.T Spence C&WA&A Year Book XC1 1991), ie the river dam cost £127, there are no records of any stonework being purchased. One can only suppose that the stonework came from the local Roman buildings. The Swimming Pool Field no longer houses a swimming pool, as the pool closed over 20 years ago. The Swimming Pool Field, crossed by a footpath from near Brougham fort, is well worth a visit, especially in winter when the grass is low. The field, it is also accessible via the footpath from Eamont Bridge. If approached from Brougham Castle, as soon as you step over the stile into the field you are standing on a c80m x 20m paved area, this was the Roman walled quayside, note the drop into what was the harbour. A free standing line of quays separated by a water channel, paralleled the large paved quay. On the River Eamont side of the free standing quay, a scan located a line of three sunken (buried) Roman craft, each 10m x 3m, their centres are 53520-29239, 53499-29259, 53485- 29263. This section of the harbour is connected by a number of channels (canals) to the River Eamont. There are several other hollows on this site, inter-connected by canals. One hollow also contains a small sunken craft. Most ancient boat yards used dry docks to construct their vessels, it would appear that the Swimming Pool Field was also the site of a boat building and repair yard.

Sceugh Farm Harbour. (Adjacent to Penrith to Alston Road).534-301.

Several years ago I excavated a section of the puddled clay lining of this harbour and an aqueduct discharging from an adjacent fort (400m x 180m) into the harbour. The presence of pudled clay was confirmed by the builder when the harbour was excavated prior to being backfilled to form a solid base for a caravan site. The harbour was accessed by a set of ladder locks from the short byepass canal flanking the River Eamont. This canal marked on the OS map of the area, still contains the stonework of the locks.

Thacka Beck Harbour. 5244-2952. This harbour, at the rear of Penrith Hospital, was originally accessed from either the Rivers Eamont or Petteril, via Thacka Beck canal which linked the two rivers. The harbour runs parallel to Tynefield Drive, (By the Fire Station). The harbour site is best viewed from by the Mountain Rescue building. Looking southwards, east of the houses, a man made platform is visible. This was the site of the

Roman guard house which defended the harbour. The guard house contains one barrack block and a small granary. The puddled clay lined harbour, has been backfilled. Possibly the harbour serviced Penrith Roman Town and the adjacent highway. The Shap road (A6), from Eamont Bridge, ran under the hospital and fire station, and continued as a c10m wide road along the line of Tynefield Drive, through Penrith towards Beacon Edge. The Shap Road was also joined by a leg of High Street which ran through the south end of the

Ullswater School playing fields. The combined roads linked with the roads from Brougham, (Frenchfield harbour) and Lowther Bridge, near Beacon Cemetery.

Google Earth. A friend was reviewing his farm`s boundaries using Google`s satellite imagery. He noticed a curved dark outline in a nearby field, one with a visible, unusual depression, knowing that I had surveyed the area, asked me “What is it” ?. My reply was “It`s the wall of the Roman harbour”, 4975-2655, connected by canal to the R. Eamont. As the canal which linked Thorpe harbour to Moor Divock, via Celleron, was built over, flooding frequently occurs. Hence locally, the Celleron road is called the River Celleron.

Ullswater College. Every Roman fort, town and suburb had it`s own small harbour. A good example is the one (5160-2955) adjacent to Ullswater College and the Eden District Council`s sports centre. Whilst only a depression can be seen, scans across the area have located the quays and the supply aqueduct. The water supply for this harbour was via a large aqueduct, fed from a large spring, situated between the Roman trapezium shaped praetorium which housed the Roman Governor(Crescent site) and the North Lakes Hotel.

Westmorland Holme Harbour. 5260-2870. Accessed from by the Eamont Bridge, Fire Brigade convalescent home. This 60m x 25m harbour was cut out of the northern bank of the R.Lowther and protected by dykes. A scan showed it has three, 10m long x 8m wide quays running parallel to the river, spaced at roughly 10m intervals. Presumably this harbour supplied the nearby fort, which controlled the two river crossings and also acted as a collecting harbour for craft heading upstream, Lowther, Shap, Wet Sleddale etc or via the Selkirk Canal to Frenchfield harbour. Overlooking the harbour is the clear platform of a 30m x 10m guardhouse,with an adjacent run down ramp to the harbour.

THE ROMANS USE of SPILL DAMS to SUPPLY WATER to THEIR HARBOURS.

Harbours required a water supply. Elevated forts with harbours well above the local rivers had to be supplied by a higher source of water, ie a diverted mountain steam or spring and the water transported by an aqueduct to the harbour. In the case of riverside harbours such as Frenchfield, the River Eamont had to be dammed and the water directed into the harbour. Usually such dams are gravity dams consisting of a sandwich construction, ie parallel stone walls with an earth core, sealed with puddled clay. The only local arch dams I have located are in Aik Beck, which overlooks Pooley Bridge. These catered for a greater depth of water and pressure, hence the change in design. Standard Roman gravity dams were normally designed to divert part of a river into either a harbour or canal, so had to also cater for the varying river flows. Variable volumes of water entailed the provision of facilities to enable surplus water to be spilled back into the

river downstream of the dam. The system consisted of a dam across the river, with on the harbour side, at least an onshore length, double the river width. Parallel to it, roughly 20m down stream was a deflector dyke which ended at the river bank. The paved space between the two structures formed a spill way. The onshore section of the dam had two functions, it contained a set of spill valves which could be opened to allow surplus water back into the spill way and the river. The second function was to direct the water into the adjacent harbour. Whilst the foundations of the Frenchfield dam are still visible in the river bed, the rest of the dam and it`s flanking dyke are now buried by the adjacent roads, including the A66. The dam and dyke foundations have been located by magnetic anomaly, right up to the Frenchfield harbour.

There are still a few sites in the UK where Roman spill dams can be viewed. Firstly, Drumlanrig Castle, Dumfriesshire, Scotland`s finest Roman site. This site has both the remains of an early arch dam across the R.Nith`s gorge and lower down stream, a perfect example of a Roman gravity spill dam and flanking dyke, each higher than a double decker bus, these tower over the access road to the castle. Piercebridge, Yorkshire, besides having two forts, one accessible, has a lovely example of an excavated spill dam, the flanking dyke has not yet been excavated. Note the anchor block chamfered on the inlet side only. Needless to say, the dam is called a bridge by English Heritage, even though the river is c50m away. To justify their bizarre claim, they claimed the R.Tees had moved. Yet another example of the ignorance of Roman navigation methods within the archaeological world. Two members of the Northern Archaeological Group (Ray Selkirk was a founder member), Bob Middlemass and Rolf Mitchinson, have spent many years diving in the river and have recovered hundreds of wonderful artefacts, with coins covering the complete Roman occupation. All these artefacts have been recovered from below the “REAL” Roman bridge, just upstream from the spill dam end. Proof that the course of the river has never changed in 2,000 years. Nor have any votive offerings whatsoever been recovered, downstream from the dam. For those visiting Oxford, at Sandford Locks the remains of a Roman spill dam are still visible on the western bank of the River Thames, the opposite side to the Kings Arms pub. The “on shore” section of the c150m dam is now flanked by an elevated walkway. The foundations of the return dyke lie under the adjacent field.

LAZONBY . River Eden. Those who do not wish to travel to Scotland, Yorkshire or Oxford, can visit Lazonby. Home of Bell`s Bakery. (Sadly no relation). Upstream from the swimming pool, on the west bank of the R.Eden there are still some remnants of a small Roman spill dam and flanking return dyke.558-397. The return downstream dyke deflected the water back into the river. Some of the dam`s stonework is also visible in the River Eden. The dam forced water into the inland harbour and the canal flanking the river, it`s depression still clearly visible. Stonework of the spill aqueducts is still visible. The harbour was the terminal of the canal linking to the R.Petteril via Wan Fell and used to transport stone and iron ore extracted from the sandstone. The R.Petteril was the preferred transportation highway during the winter when the River Eden flooded.

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LAZONBY and IT`S ROMAN PAST

Whilst Lazonby is really outside the scope of this book, nobody appears to have appreciated the full extent of Lazonby`s Roman Heritage. Hopefully the inclusion of a few of Lazenby`s sites may provide further encouragement for others to fully survey the area. I am extremely grateful to Mrs Shiela Fletcher, a member of Lazonby Historical Society who brought my attention to Hoggerhead Hall NY5380-3860, west of Lazonby and kindly supplied a copy of the National Monument`s aerial survey of the area. The presence of a large obviously man made cutting shown on the aerial survey, south of the railway station, provided my first intimidation of the presence of canals linking the R.Eden and the R.Petteril. It took months of surveying to locate the routes of these canals.

Hoggerhead Hall 5380-3860, was built over the granaries of a Roman fort site, always the most solidly built buildings. Many churches are originally sites of Roman fort`s granaries. Whilst a Hogg is a yearling sheep, possibly Hoggerhead is a phonetic variation of Hokker, which means crooked ie A Crooked Hall. (William Rollinson, Cumbrian Dictionary). The fort is 94m x73m and covers 1.64acres (0.68ha). Unusually, the granaries c28m x 18m were walled inside the fort. Presumably the site was firstly the granary compound of the adjacent fort (next field north), then converted to a small fort. The fort had four double bastions, designed to hold missile launchers, one pair at each corner, these show on the aerial survey as semicircular structures c 7m diameter and protrude c 3m. Immediately east of Hoggerhouse Fort, down hill from the modern road, the Romans constructed a tortoise shaped walled structure 2.8acres (1.17ha) c 124m x 95m. The eastern side of the ramparts are very clear and ramp down to a small, now reeded harbour. The adjacent beck, originally navigable to the R.Eden, supplied all the sites during some part of the occupation, not necessarily at the same time. It is very possible that the tortoise shaped structure was not actually a fort, but a workers compound, under the control of Hoggerhead Fort and it`s missiles. This association of a small fort and large walled barracks has frequently been located adjacent to industrial sites. A further tortoise shaped, walled compound lies to the east, 5410-3860. 3.75acres (1.65ha). NE of these sites is an unusually shaped Roman site, 5415-2880. The site is four sided, but nearly triangular, it`s major axis c180m and it`s minor axis c80m. The faint remains of another fortified site can be seen south of Lazonby Station. 5513—3881, this is c 3.45acres (1.44ha).

Lazonby Roman Town, Harbour and Feeder Canals.
The Roman Town is situated on the east bank of the River Eden NY 9554-4030, it covers c3ha (19.2acres). The town`s inhabitants were housed in insulae c 70m x 10m, with ten unpaved rooms and one paved room. The adjacent, (south of the town) major harbour, now infilled, covered 3ha (7.2acres) NY55655-39856. Two spill dams diverted the water into the major and minor harbours. The most striking visible Roman legacy on the site is the cut stone side to the upper canal, NY55460-39943. This canal flanked the River Eden and provided access to the two harbours. The minor harbour NY55408-33965 appeared to be purely for the supply of the town. The large harbour must have been a collecting point for goods transportation up or down the River Eden and it`s connecting rivers. Ie akin to the large (c18cent ) canal harbour at Ellesmere, Cheshire, with it`s canal to Ellesmere Port and the Mersey and a cross connection to the River Dee. The harbour is far too large

to just supply the small town.

LAZONBY`S WAN FELL (Accessible from the Plumpton to Lazonby Road B6413).
The sandstone of this area, as well as Lazonby`s generally, appears to have been exploited by the Romans for both the quality of the stone and in parts, it`s iron content. The harbour for Wan Fell was constructed south of Brown Rigg, at Long Moss 52221-36740. The harbour was connected to the canal linking the Rivers Eden and Petteril. The site of an ore crusher and smelters was located at 51974-37138. The guarding fort for the area was sited at 52255-36950. The area is worthy of further surveying, high boots or similar, are advisable, adders are reputed to be present.

ROMAN CANALS. FURTHER EXAMPLES THAT MANY FOLK PASS DAILY
From Yanwath School, a road runs southwards to Glendowlin, a dead end 5125-2725. The large man made depression flanking the road to the northern side was the course of a Roman canal, the canal`s flanking aqueducts are still in place and highlighted in the recent snows. The canal accessed the local iron ore deposits within the upper limestone deposits, the lower sandstone was acessed for building purposes. Roughly 200m up the road, accessed by a gate, is a bird watching hide, under the control of the local Parish Council. Ducks used a section of the now heavily reeded canal. The raised area between the gate and the hide still contains the foundations of a small Romano Celtic temple.

Yanwath School to Askham Road. Just south of Bobs Lonnen, the road dips sharply, and is flanked by wooden fences 5115-2610. This is the line of the EW canal which served the nearby iron ore site. The odd raised area some 100m to the east of the road, marks the line of the Glendowlin Roman smelter ramps.

Yanwath School to Tirril. The dip in the road 517-271, immediately west of Bobs Lonnen, once a noted flooding problem, until a hole was built nto the wall, marks the line of the canal which connected the Highfield iron ore exploitation site, to the R.Eamont.

Tirril. Ladybeck was originally a Roman canal, which provided a transportation highway from the River Eamont, via Tirril to Moor Divock. Stonework of the original Roman dams can be seen from the flanking Sockbridge to Tirril footpath (Eddie`s Way) 5015-

2680. The nearby Quaker Meeting House was built on a Roman granary. A Romano Celtic temple lies under the adjacent graveyard. The frequent heavy flooding of the area around Broard Ing, Celleron to Tirril was created by infilling over the line of the Roman canal, not a good idea. Recent excavations to install a water main installation alongside the Celleron to Askham road 50009-24494 cut though the still running flanking aqueducts of the Ladybeck canal, blocking them. Serious flooding of the adjacent road now occurs. Needless to say, the existence of a Roman canal and it`s flanking aqueducts are denied. Yet the ramparts of a Roman fort and adjacent quarrier`s compound are clearly visible alongside the canal. If you understand Roman engineering. Near Barton Hall, on the Tirril to Penrith road, flooding of this road also occurs after the installation of new pipework running north-south, cut through the Roman aqueducts and the canal running east-west which connected to the nearby River Eamont.

ROMAN GOVERNMENT OF THE NORTH WEST.

The construction of the immense Roman infrastructure in the North West was the result of intensive planning and execution, this entailed recruiting and housing a large engineering design staff. The first task was to survey and map the complete area. Dr Alan Richardson`s book "The Roman Surveyors in Cumberland" describes this work in detail. Then teams skilled in road and bridge construction, river navigation and canal design had to be formed. Parallel to these activities geological survey teams had to be organised and sent out into the mountains to locate the sources of the metallic ores. Then preparations had to be made for obtaining a work force and housing and feeding them. One can but assume that the work teams consisted of a mixture of Roman army, prisoners and in some cases, locals plying for hire. There is evidence of this in the Askham, Moor Divock area, Oxford Archaeology North`s carbon dating of one pre-Roman site showed that it functioned throughout the Roman occupation, the village occupants working the adjacent ore working sites of Roman design. An early example of job creation. We know that the Legions provided skilled men for specialists work, but the three Legions with their c 15,000 men had a prime responsibility for the country`s security, so their work parties required augmenting. The presence of Ogam, Irish script on some of the local Roman temples indicates that Irish prisoners ex the Roman invasion of Ireland, formed part of the work force. But, it is of course possible that some of these were the original McAlpines Fusiliers, complete with picks and shovels, plying for hire. My surveys on the Isle of Arran have shown that the Romans sub contracted the exploitation of gold mining to specialist Chinese miners. As of course Queen Elizabeth 1st sub contracted the exploitation of the Mines Royal in Cumbria and Wales to German mining experts.

Throughout the ages all governments considered that they deserved gilded palaces. The oldest local palace, possibly constructed for a king of Cumbria, is a 400m long x 100m wide heavily defended souterrain site on Moor Divock, the foundations of it`s colonnaded entrance are still in place, situated at the end of a stone lined avenue. (T.C.Bell`s Stone Circles, Temples and a Souterrain. (Penrith Library). The local evidence is that Roman Governor`s aspirations for high quality residences were no different. Except that the rewards for failure in the Roman world differed, our failed politicians now go to the House of Lords, or Brussels – Strasburg and become wealthy. Hence politicians wish for

Britain to remain in the EU. But failed Roman politicians tended to meet an early death, from poison, beheading or just plain bloodletting. The old methods had merit.

GOVERNOR`S FORTRESSES (Trapezium Shaped, Turreted. Praetorium)

A trapezium has two parallel sides of different lengths, connected by angled sides. Five such sites have been located in the Penrith area. Johnby Crags, near Greystoke, Penrith, was exploited for it`s iron ore by the Romans. Immediately south of the Crags, the Romans constructed a multi walled site c 300m x 200m, with a trapezoidal shaped praetorium at it`s heart. The formal ramped entrance on the eastern face was cut out of solid limestone .A scan located twelve plinths, six per side, flanking the entrance. These plinths presumably were placed to display the standard statues that portrayed a lion eating the head of a criminal, the fate in the amphitheatre ring for those who trespassed on the governor`s property. The defending forts on this site could house several hundred guards.

Ullswater Governor`s Fortress. A larger site 500m x 450m exists near Ullswater, this for some period housed the governor of the province and his senior army officer. This amazing site and the nearby Roman city of Ullswater, both discovered by the author after over a decade of surveying, will be the subject of a future publication.

BROUGHAM HALL

Brougham Hall. 528-283, was based on a Roman trapezium shaped praetorium. Accessed via A6 Lowther Bridge and B6262, this fascinating mock fortress building, south of Penrith, is being lovingly and expensively rebuilt by Christopher Terry. This commanding site overlooks the Lowther Bridge and the River Eamont. The site was firstly developed by the Romans as a praetorium to house the governor of the region, or the general commanding the army, we will never know who was the first occupant. The beauty of this accessible site is that it`s reconstruction assists those who require solid walls to understand form to appreciate the original design of the Roman praetorium, so making it probably the finest such site in Britain. An exhibition held in 2008 at Brougham Hall to display the finds from the nearby Brougham vicus ex the United Utilities pipeline excavations for the Hackthorpe to the Penrith sewage plant, also featured some lovely examples of Roman pottery excavated from the Brougham Hall site.

The original Roman praetorium building was trapezium shaped and had four towers, one at each corner and was roughly 60m x 55m. Externally the site was protected by a series of external walls and ditches and a triple layer of “Lilia”, these are man trap pits, a standard accessory for such praetorium. The sharpened wooden spikes at the bottom of the pits were designed to enhance the pleasures of those who attempted to break into the praetorium. One section of infilled “Lilia” are still accessible alongside the car park. The south wall and tower with it`s Roman gateway base are on the original Roman foundations. When visiting the site, stand alongside the well by the Fusion cafe and envisage that was just inside the Roman north western tower. The area enclosed by the walls contained, a further defensive walled structure (core) which contained the senior official`s own courtyard type villa, a toilet, bathhouse and temple. Outside the core, but inside the praetorium, lay two further courtyard type villas, these housed the senior official`s staff. The rest of the space was taken by granaries. Outside the trapezium

shaped praetorium, to date, the toilet block and temple for the senior official`s staff have been located. The toilet block was opposite the Fusion Café entrance, the main temple was under the sunken garden. Somewhere must be the site`s bathhouse. All the foundations of the above mentioned buildings are still in place and have been located by magnetic anomaly surveys.

The Roman main entrance to the site was to the south east, alongside the “modern” flanking wall. (ie left of what is now the main entrance). The foundations of an external turreted rectangle still exist outside the trapezium shaped praetorium, now a well mown grassed area. This was accessed by a series of triple gates, again another unique feature of Roman trapezium shaped praetorium. The formal drive, a standard feature with such praetorium, was walled up to the gated outer walls. Between the walls and the formal drive a number of plinths were placed, these carried statues. The statues depicted a lion

biting the head of (or off) a criminal. Identical statues can be seen at Dacre Church, one at each corner of the churchyard. A statue with a similar theme can be seen in the Edinburgh Museum, it is called the Cramond Lioness and is Scotland`s most valuable Roman sculpture. This lioness is recumbent, but still biting the head of a bound criminal. The scene depicts death “ad bestias”, the execution of a criminal in the arena of an amphitheatre. The statues are a warning to intruders, this is your punishment if you are found here. The three amphitheatres I have located contained lion - cat houses with an adjacent jail and a tunnel to the arena. So the lions did not just have a diet of Christians.

On my first survey of Brougham Hall, I wondered how the water was supplied to this elevated site. A scan inside the grounds of the site indicated that the artesian well had been dug immediately alongside the major Roman aqueduct. The Romans used spill wells, the water was taken from a flowing source via an aqueduct to a square stone or wood lined well, c 3-4metres deep. The well head was protected by a light structure to keep animals and dirt out and protect water drawers in inclement conditions. Excess water was spilled, either to another lower well, for example in Sockbridge`s Roman town, four wells in line were fed via aqueducts from nearby springs. The spilled water was used to supply wash houses, then to flush the toilets, finally to top up the canals. Nothing was wasted. A scan around the site indicated that the aqueduct ran down hill in a south easterly direction. A further survey 540-288 c 80m along the road between Brougham Roman fort and Fremington Farm noted a depression running SE across the field, a scan in the road in line with the depression located the aqueduct. So it appears that the water supply to Brougham praetorium and it`s associated forts was taken from the River Eamont, via a siphon aqueduct. The discharge from the praetorium downhill to the River Lowther, west of the site, providing the siphon. The formal drive from the praetorium connected to the hubs of the major roads North East South and West. Guarding the occupant of a Governor`s Praetorium was taken very seriously. Four adjacent forts have been located;

Chapel Fort.The adjacent Brougham Hall chapel site was constructed over a small fort, which contained six barrack blocks, three on either side of the chapel, ie 480men, a cohort. The chapel was built over the site`s granaries, the senior officer`s house (praetorium) and the offices (principea) are on either side of the access path at the car

park end of the chapel.

Cavalry Fort. The senior official housed in the praetorium had a cavalry guard numbering c 120, these guards where housed in a fort 5277-2840, immediately north of the car park, the eastern ramparts can be seen lower down the field. The approximate size of each Fort`s garrison can be established by counting the foundations of the rooms in each Barracks, each room held 10 men. The foundations of the stables are adjacent to the car park. The lilia man traps are between this fort`s walls and the car park.

Eastern Fort. Further down the field (NE) from the car park, a second rampart can be seen, this is the lower rampart of a further fort, 5285-2845, this held six barrack blocks capable of housing 480 men, a cohort.

Western Fort. The ramparts of the fourth fort 5260-2835, can be seen looking northwards from the road (B6262) between Brougham Hall and the Lowther bridge (A6). The ramparts of this fort form a grandstand for the Penrith Show. This fort also contained a further six barracks, also capable of housing 480men, a cohort. Thus the combined guards for the occupant of the praetorium, totalled three cohorts of foot soldiers, 1,440 men and probably 120 cavalry men who formed the mobile guard. Quite an expense and indicative of a lot of fear of assassination, the norm for Roman governors.

Within the Penrith Show Field, alongside the river, there are also the barely visible outlines of a small earlier fort`s ramparts. The remains of the toilet block foundations are still visible in the river bank. Bill Robinson, the then, Lowther Estate manager, a keen canoeist, reported their presence to me. A wade down the river in high boots confirmed the site. This fort was probably an early fort constructed to protect the crossing, pre the construction of the senior official`s trapezium shaped praetorium. The late Lord Lonsdale and his staff gave me much appreciated support during my surveys.

The CRESCENT FORTRESS, PRAETORIUM. (OSY 514 292).
Adjacent to the North Lakes Hotel.

Whilst one can never be entirely sure of events, but it is very likely that the last and most grandiose governor`s praetorium to be constructed in the North West, was at Penrith. The hub of the north western Roman operations was a beautifully sited praetorium, positioned to overlook the mountains and Penrith`s amphitheatre. The standard trapezium shape was slightly modified, ie the major (front) normally flat face being slightly angled in its centre to form a five, not the normal trapezium shaped four sided figure. The south face of the praetorium overlooked Penrith`s amphitheatre, the site now a football pitch flanking the A66. The angled south face measured 150m wide, front to back was 130m and it was 50m wide at it`s narrowest point. The building covered c1.4ha. Two thirds of the ramparted platform, with it`s still visible rounded ends and paved access ramps, now supports a sheltered accommodation complex, called “The Crescent” after the shape of the Roman platform it was built on. The construction of the complex built in 1986, is commemorated by a plaque. A few years ago I wrote to the then Chief Executive of Eden District Council suggesting that a second plaque be erected to record the site`s first

occupants, the Romans. The letter was ignored. Presumably there was no wish to highlight that the council had built over one of Britain`s most unusual Roman sites, without any form of archaeological pre construction survey being carried out.

TRAPEZIUM SHAPED, TURRETED PRAETORIUM

Thanks to the amazing photographs of "Jordan From the Air", by Robert Bewley (English Heritage) and David Kennedy, taken whilst surveying for his Highness, King Hussein (2nd) of Jordan, we have been provided with a photograph of an original praetorium, in a superb condition, as good as new. The photograph of a governor`s residence is reproduced with Robert Bewley`s permission. Previously to this publication, this form of building was unknown in Britain. This photograph enabled me to solve the mysteries of several sites including Penrith`s Crescent. These sites included Montgomery Castle, (mid Wales), Cramond, (Edinburgh) (probably for Emperor Severus), Drumlanrig

Castle, (Dumfriesshire), which I surveyed for the late Duke of Buccleuch, Brodick Castle, (The Isle of Arran), Jonby (Greystoke), Dunmallard (Ullswater City), Brougham Hall, (Brougham) and Lowther Castle.

A scan north of the Crescent sheltered housing, within the walls of the praetorium, located some of the foundations of a c50m x 30m enclosure, this was the core of the praetorium site which housed the governor. Cramond`s (Edinburgh) trapezium shaped praetorium site, has a rebuilt smilar core, this contained a courtyard villa, toilets, small bathhouse, temple and a small granary. Adjacent to the governor`s core site, are the foundations of several villa type buildings, presumably for the governor`s staff. Discerning visitors to the Crescent site will immediately note that the ramparts, with their standard Roman rounded ends, are far wider than the superimposed modern building. As with Penrith Castle, this is indicative that the "modern" buildings have been superimposed on an older site. Fortuitously, the foundations of the praetorium`s granaries, temple, toilets and bath house have not been built over and still lie under the nearby public amenity grounds. The praetorium also housed the governor`s cavalry guard, probably two squadrons of 32 each, the foundations of the two double roomed barracks and their stables are under Pearson Court and adjacent houses. The foot guard, a complete cohort of 480 men, were housed in six double roomed barracks, their foundations are under Thirlmere Park.

Whilst carrying out a final survey of the area I was told by a local that a small pond had existed east of the Queen Elizabeth Grammar School (QUEGS)playing fields, the pond site now mainly covered by the houses in Cliford Close. Suficient of the original "pond" area existed in the courtyard area to identify it by the use of magnetic anomaly surveying, ie puddled clay lining and layout of quays, as a Roman harbour. This would have been the supply harbour for the praetorium and probably the adjacent forum for the QUEGS Roman suburb. This harbour was supplied by canal from the River Eamont, the cut out for the canal ladder locks is still visible alongside the car park site for the playing field.

The positioning of Penrith`s praetorium fort with it`s wonderful view of the Lakeland hills, it`s shape and unusual angled design of it`s ramparts, plus it`s proximity to Penrith,

all suggest that it was constructed as a very superior residence, presumably for the Northern Governor of the area and his staff. Sadly as no archaeological survey of the site was recorded prior to the construction of the modern building, we can only surmise who the site was constructed for. This would have possibly been the finest example of such a building in the whole of Britain. A request to the local council for sight of the original foundation plan of the site was refused on grounds of security. Further credence for this praetorium having been the residence of a governor or similar, senior official, is the presence of two adjacent forts, to house guards. Fort No.2 (alongside the A66) which has not been built over, also contains the barracks and stables of a 32 strong cavalry unit, possibly the governor`s guard. (Site first recorded in the 19th cent by D.W.Dymond C&WA&A Transactions. A series of Lilia, defensive man trap pits, have been located between the granaries under the adjacent housing amenity area and the Queen Elizabeth Grammar School playing fields, which are also on the site of a Roman suburb of Penrith.

Each of the trapezium shaped praetoria located in various parts of the country have been defended by Lilia man trap pits. The fifth praetorium site, Lowther, is complete with a small town and theatre. The site is on private land, the survey is ongoing and as such, not available in the public domain.

PENRITH`S AMPHITHEATRE. THE CRESCENT SITE.

The ramparts of the Crescent tower over a public amenity site, sometimes used as a football pitch, which is under the care of Eden District Council. The site (5140-2906) is adjacent to Junction 40, M6, the North Lakes Hotel and the A66 . A magnetic anomaly survey over the football pitch confirmed it had been constructed over a Roman amphitheatre, the arena`s seating levels are easil detectable. Sections of the arena are visible from an aerial survey. The amphitheatre was obviously sited to provide the governor with a superb view from his fortress. The site covers an area 100m long x 90m wide. An outer wall and external ditch, made the site secure. The site was accessed by four public gateways with pay booths, three to the south (A66 side) and one to the west (North Lakes Hotel). Staircases c3m wide, their foundations are still in place, gave access to the upper part of the amphitheatre formed by banking earth on a cobble stone base. An inner wall 90m x 65m secured the amphitheatre. In the space between the two walls on the south side (A66) are the foundations of three buildings. At the eastern end, a toilet block 11m x 7m. At the western end, a 8m x 6m building, complete with an aqueduct fed water supply housed the lions. Alongside are the jail`s foundations 15m x 4m, which contained 16 cells, each c 1.5m x1.2. A tunnel 1.5m wide and 46m long, connected to the arena of the amphitheatre. Death “ad bestias” in the arena of an amphitheatre was the standard method of execution for criminals.

A second toilet block, 9m x 6m, was situated under the praetorium`s ramparts at the north east side of the site, an adjacent well provided water for the customers. The well area is now marked by an area of weeds. A further well was situated inside the inner walls of the amphitheatre on the southern side. (A66 side). From the praetorium ramp, a road connected with the ramp from Fort No.3. The amphitheatre`s arena is c 20m x 11m, the seating was probably wooden seats set onto earth terraces. The southern side had eight

rows of seats, the other three sides each had eleven rows of seating. Three aisles, one on each of the north, east and western sides gave access to the seats. Immediately in front of, what is now the goal area of the football pitch, the governor had a special suite, backing onto the fort alongside the A66 (for safety!). The suite was 10m x 5m, one 10m room provided a viewing site, this was accessed by a passage way, on one side of the passage (praetorium side) was a toilet, the supply and discharge aqueducts are still in place and a similar sized room on the other side of the passage.(A66 side) We can only assume that at the end of the Roman occupation, the amphitheatre was used as a tip and eventually grassed over and used as pasture land. The existence of the amphitheatre was forgotten over the last 1,600 years, until my surveys revealed it`s existence. The presence of Penrith`s superbly sited amphitheatre, overlooked by an amazing praetorium, with it`s highly visible superb ramparts, complet with a lovely mountain view, is yet further proof that Penrith, not Carlisle, was the Roman administrative capital of the north..

Two years previously in NE Cumbria, I located on a private site, a similar sized Roman amphitheatre site c 70m x70m, complete with one clearly visible staircase. This site was firstly located visually, then fully surveyed by magnetic anomaly. Finally I hired a geophysics contractor at a cost of £3,500 to survey the site. This company, who also carry out the geophysics for the Television Time Team, used a combination of fluxgate gradiometer, resistivity and ground radar survey methods. This geophysics survey located the amphitheatre`s denser hard packed banking which formed the terraces, the stonework of the staircases, the aqueducts which supplied the public well, the tunnel for the lions to enter the arena and even an unsuspected adjacent bathhouse. But it was only on a topographic model which combined the magnetic and the resistance surveys, that one could see a basic outline of the terraced seating, against the hard packed banking. The site has also been surveyed by four other independent magnetic anomaly operators, including two from a southern branch of the national society. All were able to detect and count the seating terraces. This indicates the accuracy of magnetic anomaly surveying.

In 2008 I located an amphitheatre, c 60m x 60m within a Roman town at Cullen, on the Moray Firth. This is the first amphitheatre found in Scotland, in an area the historians tell us “that the Romans did not settle”. The Cullen amphitheatre was formed by firstly enclosing the stream in a lovely aqueduct, part of which has fallen in and it`s construction is fully visible. Then they constructed three dykes across a narrow valley. Between the wider spaced pair of dykes (Nos 1&2) the Romans constructed seating terraces down the sides of the valley, with the Governor`s seating across the face of the dyke overlooking the enclosed area. Within the small space formed between the second and third dyke, they constructed the lion`s house and adjacent execution jail and a fodder house, their foundations are still in place. A tunnel connected the lion`s cage to the arena. (see Three Roman Harbours on the Moray Firth. T.C.Bell). The Cullen amphitheatre lay undetected for 1,600 years in a wooded area. The wooded site was actually within a superbly laid out Roman town, now farmland. But thanks to General Roy, a brilliant Hanovarian engineer, with a hobby of surveying Roman sites, the site was recorded. A colleague, Davy Davidson brought the map to my attention, I merely followed the map. Sadly some members of the Scottish “Establishment” frequently voiced comments, ie “The Romans

never settled north of Hadrian`s Wall", act as an deterrent to potential students of Scotland`s Roman fascinating historic past. Now my attitude is, if such folk say, the Romans did not settle there, that`s the ideal place to survey. In Nearby Cullen the Romans excavated some 1,500,000 tonnes (1.5million) of spoil to extract the iron ore. An 18hole golf course has been constructed within the excavation site. BUT, I was the first to question, "where have the cliffs gone?" The onlooker does see more of the game.

THE FORTS WHICH HOUSED THE (CRESCENT) PRAETORIUM`S GUARDS.
Two adjacent forts also provided accommodation for the governor`s guards.

Crescent No.1.Fort 5157-2905 1.5acres (0.6ha).The southern ramparts of this fort and one gateway are still recognisable, the rest is covered by housing (South side of Clifford Road). Amusingly the fort`s southern ramparts and gateway with it`s visible stonework still forms the route of a footpath which connects the football pitch with Clifford Road.

Crescent No.2. Fort (A66) 5155-2899 c2.4acres (1.09ha) 190m x 80m. This lozenge shaped fort is situated alongside the A66, in the public recreation area. Fortuitously this site has not been built over, (yet), the ramparts of the northern side are fully visible, one gatehouse has been part excavated, by persons unknown. The construction of the A66 have raised the ground to the level of the fort`s south ramparts. The fort contained six barracks for 480 troops (cohort) and a separate barracks for a cavalry unit of circa 32men. Just within the North Lakes Hotel grounds are the foundations of Roman toilets, a small harbour, and external granaries, possibly for the use of the suburb under the Queen Elizabeth Grammar School`s playing fields. The harbour was connected to the River Eamont via ladder locks. A large spring supplied the water for the site and was also ducted to the harbour at the south end of the Foundry Fields alongside Ullswater College..

PENRITH`S ROMAN THEATRE.
To the north of the Governor`s Crescent praetorium, lay Penrith`s Roman town. All Roman towns appear to have been provided with a theatre. Penrith town`s theatre was sited at the base of Beacon Edge, using the hill side to provide a natural auditorium, Brentfield Way and Oak Road housing now occupy the theatre site. The foundations of the gateway to the theatre are still under the amenity area flanking Brentfield Way.

PENRITH`S FORTS. Summary.
Beacon Edge 5335-2975 Roman Fortlet. Designed as a "Barracks" for troops in transit.. The site is situated alongside Beacon Edge, at the cross roads of major Roman N-S and E-W roads. The site covers c150m x 80m, this includes the walled granary compound. The fortlet contains six barracks and could accommodate 480men, a cohort. Below the fort, (west), the depression of the harbour is a prominent feature of the hillside. At the east end of the fortlet, the agger of the N-S road is clearly visible running down hill to Carleton Fortress

Beacon Edge 5315-3070 Signal Tower. The platform is sited between Beacon Edge and the Cold Springs-Carleton Road footpath. Best viewed from the Cold Springs footpath

Beacon Edge 52964-3075 Roman Fort. The fort`s platform is between Beacon Edge and the Cold Springs-Carleton Hill Road footpath, best viewed from the Cold Springs footpath. It`s harbours are prominent features on both the hillside and adjacent to the E-W canal, note the heavily reeded harbour, evidence that the feeder aqueducts are still functioning. This fort appears to be the guarding fort for the northern side of Penrith town and the E-W Voreda canal, the local major transportation highway.

Carleton Hill Fort 5330-3040. This fort is north of the Carleton Hill road at it`s 90 degree bend eastwards and to the right of the footpath to Beacon Edge. It is NE of Carleton Heights Fort / housing estate. The fort and granary compound cover 200m x 100m, virtually the complete field. Whilst only minor features of the fort`s presence are visible in the field, a magnetic anomaly survey identified the parameters of the fort and granary compound. The depression of the fort`s harbour, lined with puddled clay, is in the NE corner of the field, adjacent to the E-W Voreda canal, from which it was supplied. The

foundations of the 20m x 10m toilet block and wash room, not bathhouse, are still in place 53277-30320, 40m in from the field hedge to Carleton Hill Road. A major (4m) aqueduct runs down the field, after feeding the site`s wells, with a branch to the wash room, then to the toilet block etc it fed the Carleton Heights Fort, (Now 80% built over). This aqueduct runs down in a line with Frame`s (vets) surgery, as does the smaller (2m) sewage aqueduct from the toilet block. Presumably the fort`s function was to defend the NE end of Penrith Town and was part of the adjacent 600acre fortress. The design and number of the barrack blocks of the adjacent Carleton Heights fort, conveys the impression that it was either part of the training camp, or housed pioneer battalions.

ROMAN FORTS, BROUGHAM PARISH..

Whilst historians claim that the small fort adjacent to Brougham castle, was the only fort in the area, in reality, the Romans constructed at least nine forts within Brougham Parish. Brougham Fort 536-288 250m x 200m 12acres (5ha). This fort, not the one marked on the OS map at the crossroads, is immediately SW of Brougham castle, and was one of the largest forts in the area. The fort contains 66 tightly fitted barracks and could contain a legion under field conditions. The foundations of the toilet blocks are still in place, on the western side of Brougham castle. The castle was constructed on the Roman granary compound site, possibly one of the area`s major storehouses. The granary was serviced from the harbour adjacent to the castle, created by moving the River Lowther northwards.

Brougham Small Fort.538-289. Situated by the cross roads south of the castle. This fort has visible ramparts, most noticeable are the large ditches, designed to act as mini harbours, they were accessed from the R.Eamont via ladder locks. The barracks contained one paved room and ten double unpaved rooms, living rooms front, bunk rooms to rear. The presence of double rooms, rare in the north west, indicate a late date fort, probably late 4th cent. (Eric Birley C&WA&A Transactions 1952). Eric Birley considered that this fort was possibly constructed by Count Theodosius when rebuilding Britain`s defences c 370AD. My surveys over around a hundred Roman forts in Cumbria have only located four other local forts with ten double roomed barracks, ie day room and bedroom, plus an officer`s room. All the other forts located have contained barracks with 10 single,

unpaved rooms and one paved room for the officer. One of the forts at Glendowlin was also the first and only one in which I have located a hospital building.

Brougham Fort (cross roads, south of the Castle) western ditch harbour / canal originally ran northwards to the River Eamont, which it accessed by ladder locks. The canal also extended southwards (Under the Brougham to A66 modern road), to the small harbour which served the vicus. The depression of the harbour of the vicus is visible from the modern road. Excavations in the ditch adjacent to Brougham Castle in 1987 by H.Williams & Associates (C&WA&A Transactions 1992) for English Heritage, located 18 shards of Roman pottery dated to the second half of the 2nd Century and 179 fragments of Roman tiles. The ditch was identified as Roman, in fact it was a Roman canal, this served the harbour of the Brougham vicus and the later fort.

Brougham Hall Praetorium 5280-2830 Governor`s Fortress. Fully described previously

Brougham Chapel Fort 5275-2870. The fort was designed for foot soldiers. The chapel is built on the foundations of the fort`s granary. The foundations of three barracks blocks are on either side of the Chapel, providing accommodation for 480men, a cohort. The foundations of the praetorium, (officer`s house) and the principea (offices) are on either side of the path to the chapel.

Brougham Cavalry Fort 5285-2840 (NE of Brougham Hall car park). The walled and ditched site, is immediately down hill from the car park. The lower rampart is visible from the car park. The fort contains the foundations of six barrack blocks, designed for cavalry troopers, each with six unpaved rooms and one paved room for the officer. Three stables with their distinctive drainage channels are adjacent.The granaries and presumably fodder stores are on the chapel side of the site. Assuming six troopers per room, these would have accommodated c216 troopers and their officers, these troopers would have formed the governor`s own mounted guard. A larger guard than normal.

Brougham Foot Soldiers fort 5295-2845 (NE of Brougham Hall car park) immediately adjacent to the cavalry fort and lower down the hill. The lower metre high visible rampart of the cavalry fort formed the upper (S-W) rampart of the foot soldiers fort. The N-W lower rampart of this fort is also clearly visible from the car park. The fort contained the foundations of six barrack blocks. Accommodation for 480men, a cohort.
Brougham Park 5320-2825 (South of Brougham Hall). There are two forts on this site, a very early small one, barely recognisable and a later one with a distinct harbour. Visible from the “Church in a Barn”. Neither have been fully surveyed. Possibly the later fort also formed part of the defensive screen for Brougham Hall praetorium.

ROMAN FORTS, Penrith area.

Cold Springs.Walled Granary Compound. 52563-30556. This c40m x 26m granary compound is adjacent to the footpath, whether it was for the use of a section of Penrith Town, now overbuilt, or a fort, yet to be located, is not known.

Crescent praetorium. Fortress. Juct 40.M6 Adjacent to North Lakes Hotel.5140-2906

Crescent No1.Fort 5157-2905. This site is immediately east of the Crescent sheltered housing site. The prominent southern ramparts of this fort and one gateway with some stonework are visible. The rest of the fort has been overbuilt. The supply canal connecting to the R.Eamont, ran in the valley between No.1 Fort and No.2 Fort.

Crescent No.2. Fort 5155-2899 (1.09ha) 190m x 80m. This lozenge shaped fort is situated SE of the Crescent sheltered housing site, east of the football pitch and is alongside the A66 layby, by the Junct 40 M6 roundabout. Fortuitously, presumably because it has not been recognised, this fort has not been overbuilt. The northerly ramparts are still in good condition, one gatehouse has been part excavated. At the west end of the fort the elevated ramp which connected the fort to the adjacent amphitheatre is still visible. The fort

contained six barracks, accommodation for 480men a cohort. A further set of barracks with larger rooms provided accommodation for c 32 cavalry troopers. Presumably a mobile local defence unit. The stables are adjacent. The fort was supplied by the same canal fed from the R.Eamont as No.1.fort. A small harbour 51443-29056 now covered in bushes, has been located at the head of the canal at NE end of the football pitch.

Eamont Bridge. 5220-2820. Arthur`s Table. There are two forts on this site. One very early small fort which guarded the two Roman bridges over the Rivers Eamont & Lowther, was modified by the Saxons to form a meeting place. It is now called Arthur`s Table and claimed to be a henge. The site does not possess a spring source, as all henges do, so it was not a henge. A scan over the site located the foundations of the four Roman gateways, four barrack blocks, a praetorium (Officer`s house), principea (Offices) and garanaries. The wide ditches formed a harbour, a scan of the eastern (ditch) harbour recorded a sunken 10m x 3m Roman vessel, with it`s anchor out. A scan of the western (ditch) harbour was even more interesting. The fort`s harbour was accesed from the adjacent R. Lowther and a canal connected it via Mayburgh Henge, Yanwath Fort harbour to the River Eamont by South Green housing estate.

An identical sized fort to the Round Table fort is visible at Tom Winder`s Loom, 5160-2125 (Nr Whale) alongside the R.Lowther, together with the ramparts of another fort and other interesting dykes..

Eamont Bridge Fort. 5220-2820.(South of the R.Eamont).A fort 150m x 100m 3.7acres (1.5ha) with it`s eastern rampart towering over Arthur`s Table, was originally known as the High Round Table Table. 1891 C&WA&A, X1 Transactions C.W.Dymond .

Gyrus. A Roman army cavalry training ring. Noted by Stukley 1725 and Pennant 1769, (C&WA&A X1 C.W.Dymond 1891). 80m diameter with walls 3ft-5ft wide, was situated on the west bank of the R.Lowther, opposite Lowther Bridge. There is no remaining visible evidence of the site.

Fell Lane / Sandcroft Fort. 5182-3045, c88m x 50m 1.05acre (0.44ha). The ramparts of this small fort mainly built over, tower over Fell Lane. The large number of granary foundations and a 46m x 33m external granary compound indicate that this was a supply base, possibly for the Roman town and passing troops. The Plumpton –Honeypot Voreda canal ran immediately north of this fort. The canal formed the local transportation highway. Sadly the site, despite it`s clearly visible ramparts and aggers, was approved for building and partially built on, without a pre archaeology survey. One local resident, a member of a local historical society, noticed and realised the significance of the cobbled base of the rampart`s foundations exposed during the excavation for the housing and informed me of her findings. James Clarke`s 1798 map shows Fell Lane as the only road to Beacon Edge, indicating that Fell Lane was built over the Roman Road..

Fell Lane Guardhouse. 52098-30954. Fortuitously this site has been preserved for posterity, as it is free from over buildings. It contains the foundations of a guardhouse and

it`s toilets etc. This guardhouse controlled traffic into the town, via Fell Lane, it`s existence also confirms the exact line of the northern wall of Penrith`s core Roman town..
Gillwilly, Melbourne House Fort 50572-30814. 200m x 160m 7.6 acres (3.2ha)
In 2002 I notified Eden and the County Councils of the presence of this fort, prior to development work commencing. The Cumberland and Westmorland Herald published the letter. Full secrecy was observed by both councils. Test boring of the site to determine draining, located Roman features. Prior to their demolishment, the fort`s stoned ramparts formed the field`s boundaries. The fort`s harbour c200m x 100m 4.8acres (2ha) and granary compound platform are prominent features of the site. But, their significance would be lost on those do not understand that Romans built harbours in towns. Still highly visible is a section of the metre wide base of the harbour defence wall, accessible from Town Head. This defensive wall constructed in sandstone blocks, connected to The North –South Petteril defence line which linked Penrith to the Solway defences. The harbour site is destined to become a flood defence accumulator reservoir.

Kemplay Fortlet 523-290
This walled site c 20m x 100m, north of the River Eamont flanked by the A6 and A66, contains barracks for marchers / granary compound/bathhouse/harbour/ temple. The central harbour (depression) was supplied via a canal (visible near south hedge)and ladder locks from the adjacent River Eamont. The fortlet also guarded the Eamont Bridge. The site has now been earmarked for a new fire station.

Mayburgh Henge Fort 519-284. This site was also converted to a fort at some presumably very early stage of the Roman occupation. (As were the Daughters of Long Meg. The stonework of the circle provided a very good quick fix fort site). On both sites, the springs for the star shot channels, lined with puddled clay provided a good water supply. Externally on the south western corner of Mayburgh Henge, the Romans constructed a still visible platform on which to mount their granary compound, the foundations are still in place. Within the western side of the mound (overlooking the modern houses) they excavated and inserted the toilets, hence the depressions. The fallen stones inside the

Henge represent the sites of the Roman gateway towers. The site was defended by seven bastions, each fitted with a light missile launcher, all still visible.

Penrith Castle Fort .513-289. This small castle was built on a larger Roman trapezium shaped platform base, c 80m x 34m similar to the one at Wetheral Green. The foundations of the eight barrack blocks are still in place outside the castle walls, two of these barracks are unusual as they contain their own granary at the opposite end to the centurian`s paved room. Similar barracks have been located on two Ullswater fort sites, Swarthfield and Waterside.

Penrith Show Ground Fort. 5255-2835. Also see Brougham Hall. Two small forts, one with highly visible ramparts, are within the Penrith show ground, this rampart forms the viewing gallery for the show field. The foundations of one toilet block NY5255-2835 are still in place and visible by wading up the adjacent River Lowther, but only at low water. The harbour is under the show ground car park, south of the modern road, hence the

humps and bumps.

St Andrews Church Fort. 5160-3015. Standing by Arnison`s (solicitors) offices, one can envisage the fort`s raised platform, with the ramparts now accessed by the steps. The fort was trapezoidal shaped, the north face c40m, south face c56m east, and roughly 90m North to South. The fort contained eight barrack blocks. The churchyard and Roman fort platform are roughly the same size. Recently cracks have appeared in the upper walls of the St Andrews Church Rooms. A magnetic anomaly survey revealed that the aqueduct taking the spill (overflow) from one of the fort`s two wells ran under the corner of the Church Rooms. The depression of the well can be seen adjacent to the wall of the church, opposite the cracked walls. It would appear that the aqueduct has been the cause of the settlement. A survey around the church yard showed that two aqueducts ran into the site. The source was located in Brook Street. From my employment with North West Water, I knew that a channel ran down the centre of the street, the two aqueducts ran into it. We will never know whether it had been a Roman aqueduct or just a beck which had been sourced for the fort`s supply. A check upstream showed that the brook linked into Thacka Beck, a Roman canal, near the Town Hall. The temple associated with St Andrew`s fort lies under the Mansion House western car park.

Thacka Beck Harbour guard house 52130-29461. Tynefield Drive. Contains one barrack block and one granary at the south end of the site.

Westmorland Holme Fort. 5285-2875, c80m x 50m The fort`s ramparts tower over the north bank of the R.Lowther and it`s harbour. The Lowther Bridge to Beacon Edge double carriageway passed alongside this fort. The fort guarded both bridges over the Rivers Eamont and Lowther. Stonework of both bridge abutments are still in place.

Westmorland Holme Guardhouse 5260-2865, 30m x 10m This guarded the adjacent harbour on the banks of the River Lowther..

This adds up to a total of 19 forts / fortlets and three guardhouses constructed within Penrith and its immediate outskirts and occupied at some period over c350 years of Roman occupation, plus the 18 forts within the 600acre Fortress. A somewhat different total from the single fort at Brougham, claimed by historians. Excluded are the forts on the outskirts of Penrith ie the two near Nine Kirks (one overlooking it) and Barrack Wood, Clifton Hall Fort, the church is constructed over a gateway of the Angelus Line, plus those at Maidenhill, Yanwath, Glendowlin, Sockbridge, Tirril, Red Hills, Stainton, Stonybeck, Lazonby and Plumpton, Thrimby and Shap and the dozens around Ullswater.

During the surveys two interesting Roman sites were noted. One small fort at Wreay NY439-486 alongside the railway line, overlooks the bridge. The nearby fort at Park House, near Scalesceugh NE of Wreay is listed. A very interesting fort site is 1200m SE of Wreay at Bottom House Farm, NY 4415-480, the site is partly overlaid on it`s western face by the railway, the eastern ramparts tower over the river and Crooks Bridge. Bottom House Fort is c 250 x 100m 2.5ha (6acres) this is larger than the average fort in the area.

When viewed from Crooks Bridge, three run downs can be seen descending towards the River Petteril. At the north end, a large section of the c 20m high ramparts are collapsing. The cause is a common one on Roman forts, the feeder aqueduct to the toilet block has collapsed at the top of the ramparts and the free water is undercutting them. One set of the toilet blocks is at the base of the ramparts, just inside the entrance gate to Bottom House Farm. This fort is too large for the defence of the bridge or to form part of the Petteril Defence line, but it is an excellent position to station a back up unit which could both provide support for Carlisle`s harbours and via the main highway west from Unthank, also provide support for the Cumbrian coastal forts. Bottom House Fort would be supplied up the River Petteril, a major transportation highway. Following Ray Selkirk`s Pierce Bridge formulae, a Roman Bridge had a defending fort, there should be another small fort, yet to be located, which defended Southwaite Bridge. To date I have located over 100 Roman sites in the NE of Cumbria, none of which are on the official records.

Sadly, it is not only in Penrith that the records of the existence of Roman forts are lacking. My surveys of Ambleside`s Galava site located at least five forts and two further north by the Steamboat museum and one on Queen Adelaide`s Hill SD40335-98545. This hill site (with an adjacent car park) must be one of the most spectacular Roman fort sites in Cumbria, possibly originally a pre Roman hill fort. Keswick, claimed not to have any Roman forts, had at my last count, eight forts and fortlets, this includes the two at Portinscale. Crow Park, opposite the Theatre by the Lake, is one of the most accessible fort sites. The man made curvature marks the centre of the site, this was to improve the fort`s drainage. The fort`s ramparts tower over the gardens and mini golf course. I first recognised the Crow Park site from privately taken superb aerial photographs sold to raise funds for the local school. National Trust, the owners of the park have been notified.

PENRITH`S 600acre (250ha) ROMAN FORTRESS.

The Roman army constructed a 600acre (250ha) walled fortress at Penrith. The fortress

flanked the River Eamont and ran from Carleton Hall Farm to Honeypot Farm. A modern day equivalent would be the army camps at Aldershot or Catterick. A similar designed fortress, but smaller ie 300acre (125ha), was located by the author at Drumlanrig Castle, Dumfriesshire in 2003. The BBC Time Team excavated one of Drumlanrig`s fortress`s eight internal forts in 2005. The kindness of the late Duke of Buccleuch in allowing me full access to the Quesnsbury Estates enabled me to continually compare special features of the Drumlanrig Fortress with the Carleton-Honeypott Fortress. A unique experience. One presumes that the Carleton Hall fortress had three functions, it housed the rapid reaction troops held available to quell disturbances anywhere in the northern area. It housed and trained recruits to the Roman army and also housed "Pioneer battalions", prior to being despatched to major construction or ore exploitation operation sites. Of interest are David Breeze`s comments in 1987 at the Dorothy Charlesworth lecture C&WA&A Transactions 1988. He stated that it is possibly the lack of suitable available space along Hadrian`s Wall, coupled with the withdrawal of troops from Scotland, which led to additional troops being garrisoned in Cumbria. Many historians record the huge Roman marching camps, but ignore the requirement for permanent winter quarters

The Carleton to Eden Hall, Langwathby road bisects the site. Inside the fortress are 18 walled forts and fortlets, each capable of their own defence. The major fortress was sited on Carleton Hall Farm, (5308-2947), 230m x 230m, 13acres (5.29ha). One of the 230m long ramparts with a lovely standard rounded end, towers over Frenchfield harbour. One visible gateway overlooks the A66, depressions mark where the cut stones of the gateway have been removed. The southern end of the made up platform is clearly settling behind the stone reinforced ramparts. This can be seen by turning off the A686 to the Frenchfield sports ground and viewing westwards from the point where the road starts to dip.
My surveys of this site were firstly in conjunction with two colleagues. One, a very experienced architect, took one look at the depression immediately behind the southern ramparts and said, "settlement of made up ground". The ramparts, revetted with stone, have not settled. My other colleague, with 40 years of surveying Roman sites and author of several books on Romans, noted the agger (elevated east west Roman road across the site) and said "that's at the centre of the fort, so it`s twice that size". It was. Yet three successive Cumbria County Council officials have denied the existence of this huge fort, despite it`s clearly visible 230m long ramparts, towering over the Hunter Hall school playing field. The ramparts are bisected by the road to Frenchfield (originally the Appleby road). Most of this area is scheduled for future housing. One does wonder if this is connected with the denial of it being the site of the largest Roman Fortress in Britain.

Within the Carleton Hall Farm fortress the foundations of 66 barracks have been located. These are sufficient to house a legion, ie 66 barracks with 80 soldiers in each barrack block ie 5280 troops. The foundations of the large internal granaries and principle buildings, are still in place. The foundations of the fort`s bathhouse are in the copse between the road to Hunter Hall School and the feeder road to the Frenchfield pavilion. The platforms of the six toilet blocks and feeder aqueduct are adjacent to the R.Eamont.

Five of the fortress`s inner forts are shaped as tortoise shells, with a very prominent curved cross section, they are 400m long x 180m wide and cover 7.2ha (17.2acres). Their

internal arrangements are unlike normal forts, as they are crammed full of the foundations of very closely packed barrack blocks, each with ten unpaved rooms, each c 4m square and one paved room. Possibly these housed army recruits, irregulars and even pioneer battalions. One of these sites towers over Frenchfield`s sports pavilion and harbour. The foundations of the barracks and fort`s wall are still in place, much of the stonework of the walls is still visible where it has been bulldozed into the adjacent hedge. An excavation of a 40m x 25m area pre the construction of the “Blues” Football Stadium, located Roman pottery, ex Penrith`s adjacent Fortress. (North Pennines Archaeology Ltd 2008). One of the fortress`s smaller harbours is near Hunter`s Hall School west of the stadium.This harbour heavily reeded, still has the dykes and foundations of the fort`s toilets alongside.

Another tortoise shaped fort 400m x 180m towers over the Alston Road, at the entrance to Sceugh Farm. I excavated the standard Roman drainage aqueducts from this site, they led into the fort`s harbour, the puddled clay side of the harbour was also exposed for interest. At a recent (2008) public meeting to discuss proposed housing development on Carleton Hall Farm and area. I reminded the Eden District Council official, that I had

notified them of the huge fort at Carleton Hall Farm`s in 2001 and trusted that the site would not be bulldozed. An assurance that this would not happen was received from the council official. I await their actions with interest. Interestingly this official did not deny the existence of Carleton Hall Farm`s fort. This reminds me of when an official of the Lake District National Park (LDNP) told me that my theories of Romans and their forts in the Pooley Bridge area were based on foundations of sand. At the same time I was informed that the owner of a farm very close to Pooley Bridge, had received a letter from the self same official, telling him that he had a Roman fort on his farm. (Which I had already logged). Another example of the Valetta Agreement in operation. One does wonders why we have two organisations, one an unelected Quango, with duplicate staff and offices in Cumbria, no commercial company would tolerate such extravagance.

Carleton Hall Farm Fort, External Granary Compound. 5295-2938
The foundations of the forts` external walled granaries of the fortress are between the A66 and the River Eamont, parallel to the footpath. The farmer frequently ploughs out pieces of cut sandstone from this site. The granaries were supplied from river barges, a small access canal can be seen alongside the river bank and a larger canal, now infilled, ran parallel to the fence and A66 to Eamont Bridge, with a connection to Penrith`s Thacka Beck canal to the River Petteril..

The Fortress Commander`s Headquarters Fort. 535-298 was identified by it`s very large principia (offices) The man made curved platform of this small, but beautifully shaped fort, similar to a tortoise, can be seen between (north of) Hunter Hall school and the Penrith to Alston Road. Best viewed from the layby near the bottom of Carleton Hill leading to Carleton Heights. The mirror image of this fort can be seen within the 300acre (125ha) fortress at Drumlanrig, Dumfriesshire, located by the author in 2003. Presumably the northern army commander during his off duty time, also occupied the trapezoidal shaped praetorium within the Ullswater fortress of the governor of the province. .

Carleton Hall Farm / Honeypot Farm fortress was defended by a wall constructed with sandstone blocks, the wall was c 1.2m wide, constructed on a c4m wide standard overlapping “inverted T” foundation, with an external 6m wide ditch. The beautifully cut sand stone blocks of this wall can now be seen surrounding every local farmer`s fields. The stonework was quarried from either Cowraike Quarry 540-308 or the quarry just east of the artificial stone works near Eden Hall. Only one section of the fortress`s original defensive wall remains in it`s original site, this section was part of the defensive wall for the Roman harbour, now called Whins Pond and used for fishing. Cowraike quarry, one source of the Roman`s sandstone is situated on Beacon Edge, east of the Roundthorn Hotel turn off, fortuitously it is accessible by the public and mainly used by dog walkers. A canal designed to carry the cut stone / iron ore, connected the quarry to the fortress. A section of the quarry was also exploited for iron ore, alongside one face is a standard smelter ramp. The foundations of a small barrack block and adjacent granary are still in place within the quarry. Presumably these housed the smelter operators. The elevated position of the quarry also forms a good viewpoint of the Carleton Hall farm –Honeypot Farm fortress. From this elevated site three of the tortoise shaped fort platforms can be

seen and also the line of the Voreda canal running between two of the forts. This canal connected the River Petteril via Plumpton (Voreda fort) to the R.Eamont, by Nine Kirks Church. Within the walled fortress, of the eighteen forts and fortlets, all with stand alone defences, to date, only one, Carleton Heights has been 90% overbuilt.

Carleton Heights Fort. 532-320
The recently constructed Carleton Heights housing estate now covers one of the fortress`s inner forts, this was one of the larger ones c 400m x 180m. The pronounced curvature of the Carleton Hill road, follows that of the original cross section of the Roman fort, a standard design to facilitate drainage. The ramparts of the Roman fort can still be viewed east of the roadside wall, higher up the hill east of Frame`s surgery. Fortuitously, during the building on Carleton Heights several of the foundations of the Roman barracks were exposed, just outside the site barrier, enabling a photographic record to be made.

Carleton Hill Fort. 5330-3040. 4.8acre (2ha) 200m x100m.
The footpath from Carleton Hill to Beacon Edge flanks this fort site.
This fort adjacent to the Carleton Hill road backs onto the walls of the Carleton Hall Fortress.

PENRITH, A ROMAN WALLED TOWN.

The axis of the main walled town was NW – SE. The town walls ran along Macadam Way (NW), Drovers Lane, Meeting House lane, Benson Row, Folly Lane, Carleton Road, and Oak Road. Then the wall ran on a line through Beacon School, across Fell Lane to Canny Croft and bck to Macadam Way. At an empty building plot on Fell Lane c25m northwards from Brent Road, are the foundations of the Roman gatehouse whioch controlled access to the town. The town covered c180acres (75ha). Some evidence of the Roman walls of Penrith is still visible 1,600 years after the constructors left. Roman towns were defended by an external 6m wide ditch and usually a single rammed earth dyke (wall) or stone if available, constructed on a cobblestone base, c 8m wide. The

cobble stone base extended outside the line of the rammed earth dyke, or stone wall ie an inverted "T", a distinctive indicator of it`s constructor. Whilst in many cases the dykes or stone walls have been removed or ploughed, out the foundations being below plough depth, are still in place and can easily be located by a magnetic anomaly scan. Walker`s History of Penrith mentions that in 1601, a dyke at the north end of Penrith was being recast, (rebuilt) following raids by marauding gangs. It would appear that as at Carlisle and Chester, Penrith`s Roman defences were rebuilt and reused for hundreds of years after the Romans left. Sections of the bases of the town`s defensives can be seen in the following areas;
South Easterly dyke. Within the churchyard of Christ Church, Drover`s Lane.
Folly Lane. The raised pavement formed the base of the town`s dyke..
Macadam Way North West dyke. The raised section flanking Macadam Way
Carleton Road South Dyke. No visible sign, but dyke`s cobble base located by scan.

Oak Road. North Eastern Dyke. A raised section is visible in Oak Road, this was the base of the eastern section of the town`s dyke. The adjacent Roman canal now forms a

drainage ditch.

Fell Lane, 52098-30954 opposite Brent Road, is an unused building plot. Inside the plot we are indeed fortunate to have the complete 40m x 26m platform of the Roman town`s northern gateway, in mint condition. (Well nearly if one uses imagination) This defines the northern boundary of the Roman town. From old maps we know that Fell Lane was the only road from Penrith to Beacon Edge (Hence it`s name) and overlaid the original Roman Road.

Oak Road – Brentfield Way. We are also fortunate in that under the open space between these two roads are the foundations of one economic centre of Roman Penrith, 52369-30287, all in a line from the NW end, firstly the town`s major forum, (shops) 30m x 12m and basilica (administrative offices), toilet blocks 12m x 13m, a bath house 30m x 15m and a Romano Celtic temple 15m x 15m. Alongside the forum are the foundations of the lower gateway to the town`s theatre. The theatre was built into the hillside above Brentfield Way, which is now covered by housing, the well named Eden Mount. The total main town covered roughly 180 acres. There are also suburbs detailed below. The inhabitants in the town and the suburbs were housed in insulae c 70m long 10m wide, these had ten unpaved rooms and one paved, the civilian version of the military barracks.

ROMAN SUBURBS OF PENRITH

To date four suburbs of Penrith Roman Town have been located.

CASTLE TOWN (GILLWILLY INDUSTRIAL ESTATE)

This suburb 5080-2925 is opposite the tool and plant hire depot. The foundations of the 70m x 10m domestic dwellings, insulae, and forum (shops) and toilets etc have been located under the playing field and adjacent allotments. One wonders if this was at one time the vicus (village) for Gillwilly Fort.

QUEEN ELIZABETH GRAMMAR SCHOOL. (QUEGS).

A complete Roman suburb lies under the school grounds, 512-295. The outline of the foundations of these buildings are clearly visible on an aerial survey of the site. The walled Roman suburb covers c 350m x 150m, 12.6acres (5.25ha). The original sandstone walls of the suburb are still visible, the western wall line is the original line, as the inverted "T" foundations which extend beyond the wall, indicates. The stonework of the eastern wall has been resited further eastwards. A 6m defensive ditch flanked the wall on the outside. The inhabitants of the suburb occupied standard insulae, c70m x 10m buildings, each with ten unpaved rooms and one paved room, based on rubble foundations. We do not know if these buildings were single or double storied. At the centre of the southern end of the site there is a raised and curved section running NS. This contained from the south, the suburb`s colonnaded forum, (shops), the basilica, (offices), two toilet blocks, (male and female ?), the Romano Celtic temple with a central immersion chamber. The forum (shops) were supplied from the harbour now mainly under the houses in Clifford Close.The aqueduct spill wells ran in a line across the field just north of the metal store. Also just north of this store, a small gate had been inserted

into the eastern wall and the ditch bridged, this accessed an altar sited within a small wall.

Adjacent to the footpath at the northern end of the field, is a flat area, this was the site of the granaries. The adjacent depression was a small harbour, with canal access westwards ultimately to the River Petteril and eastwards, ladder locking down to Dog Leg Beck and the suburb, under Penrith`s south road car park, then to Thacka Beck (Roman canal) and the River Eamont. At the north end of the field there are the visible ramparts of a c80m x 40m fort. Amusingly the first two puddles formed across the field from the west are the sites of the fort`s spill wells, these spill to the third wet area by the tennis courts, which is over the fort`s toilets. The water indicates that the spill wells are still functioning. It will be an interesting exercise to locate the source of the site`s water supply. One also wonders if this site was at one time the vicus (village) for the Castle Fort, or the Governor`s praetorium, now mainly covered by the Crescent Sheltered Housing site.

SOUTHEND ROAD ROMAN SUBURB.

Prior to the excavations, the Roman foundations could be viewed on an aerial view of the grassed area alongside Castle Hill road and the Penrith football ground. This Roman walled suburb has been partly excavated for the now infamous Squares Development. The suburb covered roughly 450m x 200m, 21 acres (9ha). The suburb extended from the Two Lions public house, to the southern side of the Leisure Centre (51760-29652) and from Southend Road to Castlehill Road. The occupants of the suburb were housed in 70m long x 10 m wide insulae, based on rubble foundations. One wonders if this was at one time the vicus (village) for St Andrews Fort. The foundations of the suburb`s major forum, (shops), basilica (offices) and toilets, are under what is now, Victoria Road and Southend Road. They ran from near the (now closed) RAFA Club, soon to be part of a block of flats, under and past the defunct Miner`s Arms, to near the boundary of the Waverly Hotel. The recent October 2009 excavations for flats alongside the (now closed) RAFA Club exposed the sandstone foundations of one end of the forum. Also exposed was a small section of the foundations of the Roman Road to the forum and also the

stonework of the defensive wall which linked the suburb to the forum. Fortuitously the foundations were photographed before being buried under the concrete of the new flats. Copies of the photographs were sent to the County Archaeologist and Eden District Council.

Prior to the commencement of work on the Southend Road site, I notified the County and District Councils and the developer, Lowther Manelli, that the Southend Road site was of Roman origin. I explained that I had carried out a magnetic anomaly scan over the site and had located the presence of Roman insulae, these also being visible on the aerial photographs of the area. It was also explained that I had recently located and witnessed the excavation of one end of the rubble foundations of one of many insulae in a subsection of Ullswater City, prior to the mole ploughing in of a sewage pipe and that I had located c400 similar buildings in various Roman towns, so was very familiar with their construction. The site of the puddled clay lined harbour near Ullswater College was also identified. To date this harbour has not been excavated. I am unaware of anyone in Cumbria, other than myself, who has both identified Roman inland harbours and

excavated them.

The pre excavation, visible evidence at Southend Road was as follows. Aerial photographs of the grassed areas showed the presence of insulae foundations. The two dykes built on rubble inverted “T” foundations, which enclosed the Roman temple at the rear of the White Horse, one has since been bulldozed, the other still exists at the rear of the BBC building. The presence of various Roman artefacts built into the rear wall of the 16th cent White Horse Public House. These included a Roman niche altar ex a temple, a pair of toilet chutes and two small possible tomb stones. One of a white horse, hence presumably the name of the Public House and one of possibly a rabbit or hare. (paintings and sculptures hares have ben found from Asia to Egypt, often shown with several in circle with with entwined ears.. Two c metre long inscribed stones are visible on either side of the upper doorway. One wonders if they are part of one stone which has been split into two. A similar piece of stone used as a door lintol was located at Carlisle Castle and identified as a section of a Roman altar. One carving is of a delightful sunflower on the back of a tortoise. Carved sunflowers almost always relate to solar direction. There are records of temples with a sunflower in their entrance, this being was highlighted by the rising sun. (World Trade & Biological Exchanges before 1492, Profs Sorenson & Johannessen). A magnetic anomaly scan alongside wall of the public house located the foundations of an apsed ended Romano Celtic Temple, whose entrance also faced east.

This lovely example of a Romano Celtic temple, 28m x 10m, included an 8m long rounded apse. The foundations of this temple run parallel to the rear walls of the White Horse Public House. The temple site was under the Two Lions Public House`s private bowlng green. Not to be confused with the town bowling green which was south of the Two Lions Public House and under Southend Road Car Park. The town`s bowling green was excavated, needless to say they did not find the temple, so since have claimed that there is no temple. The temple`s centre immersion bath was aqueduct fed from the west, the bath spilled to the temple`s toilet. All Roman temples had adjacent toilets, one

cleaned oneself physically before entering the temple and cleansing oneself spiritually. A scan over the temple`s toilet revealed that the centre pair of toilet chutes were missing. Such scans are accurate to 50mm. Fortuitously the missing toilet chute is still visible, built into the rear wall of the White Horse Public House, thanks to the humour of the builders in perservingthe artefacts for posterity. The excavated base of a similar Roman toilet to the one at the rear of the White Horse Hotel, can be viewed from the footpath alongside the north bank of the River Eamont, opposite Sockbridge Mill.(4965-2765. The toilet base is now used as a cattle trough, the aqueduct fed water supply never dries up.

A magnetic anomaly survey is accurate to 50mm, neither foundation depth, surface cover, nor water interferes with it` accuracy. The surveyed areas comprised the grassed area flanking Castlehill Road, Southend car park, the temporary Southend car park (car show rooms), Penrith football ground and the area between the RAF Club and the Miners Arms, between Southend Road and Princess Road. Note photograph of the (70m x 10m) insulae foundation located during the initial archaeological trenching by the toilet block. The final excavations of the grassed area alongside Castlehill Road merely bulldozed the

metre wide rubble foundations of the insulae into a large heap. Their presence was apparently either ignored, or not understood. Well known in the area and recorded on the 1900 OS map was Dog Beck, it`s full name was originally Dog Leg Beck, so called, due to it dog legging around the corner of one section of the Roman site. The beck was a Roman canal which originally ran from the Queen Elizabeth Grammar School (QUEGS) harbour via ladder locks to Thacka Beck (canal). Many locals recall walking up alongside the beck to school. The unique design of Roman canals enables identification of their routes to be made by magnetic anomaly surveys, even under tarmac. Two infilled canals and a feeder aqueduct were exposed during the excavations. These were sub sections of Dog Leg canal. The sandstone sink located by the now closed public toilet block, was probably part of the original mineral water factory, amusingly the water supply appeared to be obtained from a Roman aqueduct. Penrith`s Spring Water !! The factory site is shown on old maps of Penrith. Sadly the granaries whose foundations back onto the Post Office were not excavated, although the stone paths to them were exposed.

Water was supplied to the Southend Road site via aqueducts passing, under modern property, from the spring which rises between the North Lakes Hotel and the Crescent. Roman aqueducts and canals, were constructed to a unique design, hence the ability of a skilled operator to locate them even under tarmac.

Needless to say, following the Southend Road archaeological excavations, we were told the site was part of a “never recorded” medieval Penrith. No mention was made as to how this alleged medieval site was supplied with water. Medieval Britain was not a period known to construct canals and aqueducts of Roman design. The orderly lines of the insulae`s foundations are also somewhat unlike the normal meanderings of all other known medieval towns ie York and of course Penrith itself. Obviously when Rome withdrew it`s troops c 410AD, folk still lived in the Roman towns. Modified Roman granaries are still occupied in Cumbria. But the economy, dependent on exporting metallic minerals was destroyed, no grain arrived ls fell into disuse and were backfilled.

As were Southend`s canals. Only Dog Leg Beck`s stone walled canal continued to dog leg, around the remains of the Roman site.

AQUEDUCTS. ROME`S DEADLY LEGACY TO DEVELOPERS.

Some while ago I presented a paper to the Society for the Preservationof Ancient buildings. It`s title, “Aqueducts, Rome`s Deadly Legacy for Developers”.

Under the building regulations it is illegal to build over a drain or water pipe. Firstly because all pipework must be capable of being accessed for repair and also that the superimposed weight of a building could crush anypipework, any water leakingwater could wash away the foundations resulting in building failure, flooding, or at best, settlement and cracked walls. In an area with a known Roman presence, such as Penrith, Carlisle or Lancaster, the presence of aqueducts is highly likely. Therefor it is essential that the area is checked for aquedects prior to the construction of buildings by an operator full coversant with magnetic anomaly and the design of aqueducts. Any aqueducts located require to have their water sources blanked or redirected and the aqueducts filled

with concrete. I actually suggested to the County Council that all builders and developers should be warned of the dangers of building on possible Roman sites and advise them to scan such sites before commencing construction. I was informed that this was not the County Council`s function, nor had they any record of any Roman aqueducts been reported in Cumbria. This ignored both the fact that every Roman site in Cumbria was supplied by a aqueducts and also the full photographic details I had supplied to both the County and District Councils, including of one modern Penrith house settling over the Roman aqueduct which fed the Southend Road Roman suburb. Their answer clearly indicated that there was no interest in the financial health of the occupants of crumbling properties built over a Roman aqueduct, nor to prevent it happening in the future. One can only hope that discerning solicitors acting for potential house purchasers in Cumbria will demand proof that the site is guaranteed free from Roman aqueducts. Sadly we have several sites in the area, including the A66 at Crackenthorpe, which have settled, or been flooded, even one expensive village hall which has never been put into use, all having been constructed over Roman aqueducts.

SOUTHEND ROAD SUBURB`S ROMAN CEMETERY.

Roman cemeteries were always constructed outside the town`s gates and usually along the line of the major roads into the town. In this case the major Roman road was the road from Shap to Eamont Bridge (A6 Route), then it ran under the line of the hospital, fire station, then flanked Tynefield Drive and Thacka Beck harbour to run into the main Roman Town of Penrith on it`s way to meet with the Brougham Road at Beacon Edge cemetery. This was joined by one leg of High Street`s double carriageway, from Junct 40 M6 which ran EW across Ullswater College playing fields, 51955-29540, it also linked to the southern gateway 51760-29562, of the Southend Road Suburbia. The gateway foundations are still in place. So, little space was available for the cemetery, immediately south of the suburb. A scan along the several grassed areas flanking the east side of Bridges Road (A6) showed that the cemetery had run from Tynefield Court 51895-29546 to alongside the Ambulance station, the foundations of the gateway into the cemetery are

still in place 52030-39415. East to west the cemetery ran from Bridge Lane (A6) to Tynefield Drive.

Roman cemeteries (none cremation) were walled externally and inside the walls, they constructed c 20m kerbed squares, each spaced one metre apart. Within the kerbs they placed 40 inhumations, packed like sardines in a tin, ten wide and four deep with a north south orientation. Using magnetic anomaly scanning, these features can be identified. The cemetery had held roughly 2,800 inhumations. A major discovery was the complete foundations of a large Roman temple 52023-29464 complete with it`s adjacent toilet, 52035-29461, near the wooden seat adjacent to the A6, opposite the Esso Garage area. The sick looking grass and settlement in the area was a pointer to the site. The temple foundations measure c28m x 15m, it had an unusually large immersion bath, c10m x 4m, normal size is c 2m x 0.75m. Presumably the oversized immersion bath was designed to cater for large numbers using the major roads in the area, rather than cater for burials.

Normally cemeteries had their own small temples, one wonders if a smaller temple had

been destroyed when the adjacent buildings was constructed. Every temple`s immersion bath was supplied with water via an aqueduct direct from an uncontaminated source, the bath overflowed to a toilet. This supply and the feed to an adjacent spill well 52007-29457, was teed off a 2m wide (duct), a visible depression marked the site of the well. The main aqueduct then presumably supplied the Thacka Beck guard house and then topped up the canal. A further 10m wide road ran east- west under the Fire Station, 52020-29403. Another aqueduct fed spill well, 52029-29389 was located visually by it`s depression alongside the boundary wall. The well, the light foundations of it`s well house and the supply aqueduct were all located by a magnetic anomaly scan. To date, the main cemetery for Penrith`s central walled town has not been located.

CARLETON HEIGHTS ROMAN SUBURB.

This suburb, 5320-3040 is adjacent to the 90 degree bend of Carleton Hill Road and immediately north of Carleton Heights Roman fort site, (Now 80% overbuilt). The Roman foundations are visible on an aerial photograph. The site, at present arable land, is bounded to the east and north by footpaths. The site contains the walled remains of a Roman suburb c 200m x 100m, with an external 6m wide ditch. The cobble stone foundations of the sites rammed earth defensive dykes are still in place Within the walls are the foundations of a number of insulae, these 70m x 10m buildings each with ten unpaved rooms and one paved room. These buildings are the civilian equivalent of military barracks, the insulae are spaced at 10m intervals, lengthways and sideways, with French drains (gravel) between them. Nearby are the suburbs own granaries. The suburb`s harbour was supplied from the adjacent east-west Voreda canal.

ANCIENT AND MODERN. A66 SUBSIDENCE AT CRACKENTHORPE..

In January 2008 The Cumberland & Westmorland Herald reported an interview with Appleby Councillor C.K.Duncan regarding his great concern re the settlement othe A66 at Crackenthorpe. Being familiar with General Roy`s 18th cent records of the Roman

site at Crackenthorpe and Raymond Selkirk`s recognition of a nearby riverside fort from an aerial survey, (Some years previously I had supplied the County Council with a photograph of this fort ex Ray`s survey). I immediately suspected that the cause of the subsidence was an underlying Roman aqueduct (s) or similar. I visited the site and also had a discussion with Councillor Duncan, his prime concern was that if the complete road and ledge it ran on, above the River Eden, collapsed into the River Eden, the blocked river could back up and flood Appleby. After my survey I totally agreed with his fears.

The site survey along the section of visibly affected road, located four Roman aqueducts and a Roman canal complete with it`s flanking aqueducts crossing under it. NY66813-21772. Opposite the entrance to Roger Head Farm, clearly visible from the road level to the River Eden below, was a man made cutting. The hall mark of a standard Roman ladder lock. The ramparts of one definite and one probable Roman fort, overlooked the section of the subsiding A66. Roman navigation - canalisation is my speciality.

I compiled a full report of my survey including examples of seven local sites which were suffering settlement due to being constructed on aqueducts, this included one new village

hall valued at nearly half a million pounds. Also included were photographs of ladder locks and sections of Roman canals. The report was sent to the Highways Agency (Amey Mouchel). I also offered to survey the (higher) farm area and source of the water if they obtained permission. As I had been informed that it was proposed to pile and construct a wall at the top of the river bank to retain the road (and form a dam). I cited Aberfan and Piercebridge as two classic examples of engineering failure due to water retention. At Aberfan in South Wales, 20th cent mining slurry moved and buried a school and many children. At Piercebridge 1st cent Roman engineering, the drains of a complete built up fort platform failed. The retained water built up behind the reveted front of the platform which formed a dam. Eventually the pressure blasted away most of the fort platform. As an engineer trained in cause and effect, I expressed my concern that Amey Mouchel proposed to deal with the effect, not the cause. The source of the water..

The illustrated expensive report was copied to Cumbria County Council, Eden District Council, Appleby Council and Crackenthorpe Council and Amey Mouchel. Crackenthorpe Council acknowledged via Councillor Duncan, Appleby Council did not reply. Eden District Council`s reply stated “It was not their responsibility”. No apparent interest in Appleby flooding!!. The County Council representative, no less than the Environment Planning Officer, unbelievably took me to task for my previous comments re Southend Road, Penrith and ignored the subject of my A66 survey report, Appleby flooding. Amey Mouchel thanked me for my report and stated that “since 1989” they had tried and “failed” to find “a reason” for the instability of the area”. Then proceeded to ignore mine. They had concluded that the problems lay within the naturally occurring geological strata and was “not” due to human intervention. Full stop. I had previously discussed the strata of the area with my professional geologist advisor and a natural origin to the problems was discounted. Obviously I`ll not bother casting my pearls of wisdom again !!.

Summary. In other words, the presence of the Roman sites situated at a higher level than the A66 and their associated, still functioning aqueducts, the visible ladder locks and the infilled, but still draining canal, have sadly, all been ignored. One wonders how effective the new multi million pound piling (dam) along the top of the river bank will be. Will it merely deflect the free water to a none piled area and create further subsidence?. Or just create a lovely reservoir under the A66, which one day will lift the tarmac. Hopefully for both the citizens of Appleby and the ones who depend on the A66, and of course the long suffering tax payers who pay the bills, the work be successful. Time will tell..

ARCHAEOLOGY and FINANCE.

Due to the high costs of excavation ie roughly a million pounds to completely excavate a Roman fort, most excavations are now financed by the developers of the building sites. Even carbon dating a single artefact costs c£350. Penrith`s Southend road very limited surveys cost over £80,000. At Carlisle, the Millennium part excavation into a known Roman fort, cost the tax payers c £375,000. Little of value was found (of what was, some was later stolen) and the site was backfilled, so was no longer visible to any one. A somewhat pointless and expensive exercise. The locals wanted a footbridge over the

River Eden. A view underground, without excavation, can be obtained by the use of electronic surveys, resistivity, fluxgate gradiometer and ground penetrating radar, are the most favoured, each have advantages and disadvantages, eg depth limitations and the presence of iron or water. All electronic surveys are slow and expensive, fully surveying a 100sq m site can take three days and cost c £3,500. Hence the enormous advantages of using magnetic anomaly, a simple, cheap, fast and accurate manual system to carry out the first evaluation of a suspected historical site. One can then limit the use and expense of a geophysical survey with it`s recorded output, just to the areas of major interest.

COMMENTS PAST, PRESENT & FUTURE.

One totally unexpected survey tool has recently appeared. Whilst aerial surveys have been a most useful tool for many years and most of us have one on our computer, hence being able to view the foundations under the grassed areas of Southend Road and Penrith`s amphitheatre etc. Many also use google earth satellite imagery to aid surveys. Recently I have been liasing with Tim Akers, a marine archaeologist. Tim has designed a method of enhancing satellite photography, called Merlindown, this can reduce the over burden on historic sites, be it water or spoil. In the last few years I have located many Chinese sites including their harbours in New Zealand and lately, also on the Scottish island of Arran, both visually and by the use of magnetic anomaly surveys. Tim Akers has been assisting me with his satellite enhancement of some of the sites I have previously located from New Zealand to the Isle of Arran. A similar method is called Lidar. An interesting additional, but expensive survey tool.

This book is an attempt to highlight and record the visible sections of Penrith`s Roman past, whilst they still exist and explain the methods used to evaluate these sites, without excavation. I would never claim that it includes every single Roman site in Penrith and it`s outskirts, but I would certainly claim it is the most comprehensive list ever published.

Hopefully this publication will provide stepping stones for those with an interest in the past, who sadly must ignore the "dead hand" of the Establishment if they wish to be successful. Some would say I`d have been better employed spending more time surveying Penrith more fully, than wandering the north of the UK and overseas. Possibly, but, learning from other sites especially Drumlanrig`s 350acre Fortress, and cross checking designs and features has been an essential part of my learning curve. The overseas surveys following the Chinese trail have provided wonderful historical information re their engineering, both of harbours and buildings and of previously unknown design of their "Super" junks. Without my overseas experience it would not have been possible to identify the Chinese sites in the UK. The sites on Arran have perplexed archaeologists and historians for decades, none of whom suspected that the Chinese had been either subcontracting to the Romans or had obtained mining concessions from them as part of a trade barter process.

Some while ago I actually suggested to our then Chief Executive of Eden District Council, that a visit to Melrose`s Roman Trimontium site could be educational for him. This small town with an interesting abbey, does not have a single "visible" Roman foundation, yet they run Roman historical tours with viewing platforms overlooking the buried Roman

Agricola gated fort site. (As Arran`s and Cockermouth) The town also has a small, interesting museum. There are good toilets and car parking facilities, all of which add up to a thriving tourist operation. By contrast, unbelievably, at varying times lately, Eden District Council have tried to shut Penrith`s museum, or to transfer it and the Tourist Information Centre, both vital to a town with tourist ambitions, to an out of town venue. The major toilet has been closed, the largest carpark with the only coach park, has been built over, all before alternatives were made available Several local Roman sites have disappeared without archaeological surveys and their existence recorded. Having a council with such little understanding of the bedrock of tourism ie convenient, cheap parking, including long bays for coaches and modern toilets, then we have little hope of ever getting the financial values of historical tourism understood. Sadly, even less hope of generating any interest in preserving sections of the best of our Roman legacies for future generations to appreciate.

Eden District Council does not have any staff trained in archaeology, so obtain and pay for their advice from the County Council and their sub contractor, The Lake District National Park, who both of course, prioritise their own political and financial agendas. The following is an example of Cumbria County Council`s disinterest in historical tourism and the financial benefits to struggling communities. Following the Roman trail led me to the delightful small town of Cockermouth. At nearby Papcastle is the known site of a mainly built over, none accessible, Roman fort. But at Cockermouth, I discovered a rare example of an Agricolan gated Roman fort (off set gateways) only half overbuilt. (Design as at Trimontium and Arran). The fort NY1175-3080 is actually alongside the Carlisle Bridge over the River Derwent, in a public park, with adjacent toilets and nearby cafes. A perfect venue for historical tourism. My research showed that the Papcastle fort, long claimed to be the only fort in the area, had a well recorded, long period of disuse. Obviously the smaller riverside fort at Cockermouth was better

positioned and easier to man. Nearby is the best preserved example of a section of a Roman bridge abutment in the north, NY114-311, better than any on Hadrian`s Wall..

Copies of the report and the background research, including photographs of the two sites have been sent on two occasions to the County Council, suggesting that Papcastle`s tourist industry could well benefit by the highlighting of the fort and bridge abutment. On neither occasion have my reports even been acknowledged. Thus indicating the council`s total disinterest in the financial advantages of historical tourism to Cockermouth. Another sad case of the application of the Valetta Agreement, regardless of it`s cost to the local community. ie Only an archaeologist can locate a Roman fort.

The 2009 Brougham Hall`s exhibition of the Roman antiquities ex both their own site and ex United Utilities excavation for a sewage main across the Brougham vicus, generated a huge response from the public. This response is indicative of the interest that well presented local history holds to the public. Hence the importance of publications such as this, which record Penrith`s Roman legacies, before they are surreptitiously destroyed on the altar of development by our own employees, the local Councils.

T.C.Bell CEng MIMarEST. Tirril, Penrith. 2009. Updated 2012

NOTES.

C&WA&A = Transactions of the Cumberland & Westmorland Antiquarian and Archaeological Society. Over a hundred years of the Society`s Transactions are available in Penrith`s Library reference section. The vast majority of these surveys were carried out regardless of cost or time, by dedicated private individuals recording the past for posterity. We are indeed fortunate in Penrith to have such a lovely library with it`s extremely helpful and experienced staff.

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For further suggested reading, any of the References and also;
Roman Roads East and South Cumbria Phillip Graystone`s Books are recomended
Romans & Britons in North West England & The Roman Frontier in Britain. Prof D.Shotter, printed by the Centre for NW Regional Studies. University of Lancashire.
The Towns Of Roman Britain John Wacher Book Club Associates 1974
For those who are fascinated by ancient sea transportation. Published in 2009 "World Trade and Biological Exchanges before 1492" (Columbus) by Professors John.L Sorenson and Carl L. Johannessen. This book plots the cultivars transferred from and to the New World to the Old World over the last 3,000 year. Proof of both pre Coumbus ocean voyaging and the ancient`s vast knowledge of agriculture and horticulture and of course the accuracy of Gavin Menzies`s "1421 The Year China Discovered the World".

Also highly recommended is Prof Charles H.Hapgood`s "Maps of the Ancient Sea Kings". This includes details re ancient mapping of the world when the Antarctic was ice free, further proof of ancient mariner`s activities and of course the world`s previous climate changes.

For those who wish for further information re the origin of Britain`s stone circles and rock cups and rings (and the coupled) earliest commercial ore extraction. Prof L.Austin`Wadell`s book printed in 1924. “The Phoenician Origin of Britons, Scots and Anglo Saxons”. Discovered by Phoenician & Sumarian Inscriptions in Briton by Pre Roman Briton Coins Provides the keys.

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INDEX PENRITH`S ROMAN HERITAGE.

FINISH

Thomas Cedric Bell

Thomas Cedric Bell (who referred to himself usually as “Cedric Bell” and occasionally as “T.C. Bell”) was born on 21 April, 1931, and died on 10 March, 2025, at the age of 93. He lived in Sockbridge, Penrith, UK, but has family around the world, including in New Zealand. He worked as a Chartered Engineer, with eight years at sea from Junior to Second Engineer; he spent seven and a half years as a surveyor, around eighteen years as a Works Engineer, two and a half years with Delta Metal, Birmingham, that employed c. 1,000 employees, and 26 years with Castrol Oil, which employed c. 450 and was the largest Lube Oil Factory in Europe, where he worked around fifteen years as Works Engineer and eleven years as Production Manager and Deputy Works Manager.

Cedric Bell’s hobby was Roman, Chinese, Norse, UK, Irish and New Zealand history. Exploring rammed earth dykes, stone gateways, river navigation, etc., he spent c. 26 years working on Roman sites. He actually lived in an ex-Roman town that is still surrounded by visible Roman sites. He has written two long survey reports on Roman Penrith and its region (“Penrith's Roman Heritage”: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.glenriddingcybercafe.co.uk%2Fdocs%2FTCBell%2FPENRITH%2520ROMAN%2520TOWN%2520EVIDENCE..doc&wdOrigin=BROWSELINK and “The Route, the Guarding Forts & the Roman Towns and Cities and major highways it linked from Windermere to Ullswater & Penrith”: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.glenriddingcybercafe.co.uk%2Fdocs%2FTCBell%2FHIGH%2520STREET%2520ROMAN%2520ROAD.doc&wdOrigin=BROWSELINK), and another on Roman Scotland (“Scotland's Roman Heritage”: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.glenriddingcybercafe.co.uk%2Fdocs%2FTCBell%2FPORTSOY%2520-%2520NORTH%2520SCOTLAND%2560S%2520ROMAN%2520HERITAGE..doc&w

dOrigin=BROWSELINK); he has also spent six years training with the U. K. expert on Roman river navigation; he has given c. 150 site survey reports to U. K. museums and libraries. In addition, he has written a survey report comparing Roman with Chinese engineering and another on Roman and Chinese river and canal engineering. He also researched the ancient Chinese canal in Nicaraguan, which linked the Caribbean Sea to the Pacific Ocean (pre-Panama Canal). The actual survey on site was carried out by Col. John Blashford-Snell, Britain's best-known explorer. Cedric Bell's surveying experience extends to one survey on Cape Breton Island in Canada, five surveys in New Zealand, one in Ireland, and hundreds in Scotland and the Isles, and Northern England over a 30-year period. This includes using magnetic anomaly survey (MAS) and hiring expert geophysics surveyors.

Unfortunately, Cedric Bell was largely ignored by the academia and governments he reached out to. In fact, his notes mentioned which of the sites he found ended up being deliberately destroyed.

Cedric Bell carried out these surveys at his own expense for no monetary gain. He did not seek fame either. His dedication came from the love of finding the truth. He was generous to people who shared the same faith with him by patiently explaining his findings and mailing his survey reports to them. Cedric Bell's discoveries and spirit will live forever in our minds and hearts through his memorable words:

We can but leave our stepping stones for others to follow.

It is hoped that publishing these surveys will attract people with an open mind to view information not publicly available before. It is hoped that this information will not be used to deliberately destroy other sites and instead will further Cedric Bell's theories, whether to confirm or refute findings with more modern methodologies.

Cedric Bell's ORCID ID, for contacting researchers working in this field (and who knew him), is https://orcid.org/0009-0002-1189-3433 . We will happily answer your enquiries on Cedric Bell's behalf. Cedric Bell and his estate own full copyright to all his works.

Bell's ORCID ID