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Connectivity with Minoan mountain farmers: Protopalatial roads and paths in the Agios Nikolaos area

ABSTRACT

Along the mountain slopes west of Agios Nikolaos (between 600 and 1400 m), over 330 farms of the Minoan Old Palace period¹ and their relationship to the surrounding landscape were studied by the author for her PhD thesis (Beckmann 2012). These Bronze Age installations also had – apart from house ruins – well discernible wall-enclosed courtyards and animal folds, in many ways characteristic of mixed agricultural mountain farms until recently. Most of them also had very long (often over 1 km) boundary walls (“perivoloi”). Usually the houses and walls were built using massive stones (“oncolithic masonry”²) and are thus often well recognizable until today.

One of the remarkable features of the landscape surrounding these farms, datable (by surface pottery) to have been built between ca. 2000 and 1650 B.C., is a great number of roads and paths (over 140 km in total), bordered and thus identifiable by these ancient walls on one or two sides, sometimes also furnished with a cobblestone surface and even steps. When drawn on a map these “roads” constitute an intricate network of connections between sites and towards the regions beyond the settled slopes.

In this paper examples of the Minoan roads/paths and their typical landscape features and construction details are discussed, as well as the question what information can be gained by their study, on connectivity in Minoan Protopalatial north-eastern Crete.

ΛΕΞΕΙΣ ΚΛΕΙΔΙΑ: Minoan roads, Middle Minoan landscape, Cretan Bronze Age transportation, Minoan Protopalatial mountain settlement

CONNECTING PLACES IN CRETE

“Il n'existe dans l'île aucune voie ferrée, aucun chemin carrossable, à l'exception de celui qui relie la Canée à la Sude; les voies de communications terrestres ordinaires sont des sentiers, praticables seulement pour les chevaux, mulets et ânes, à dos desquels se fait, exclusivement à l'intérieur, tout transport de voyageurs et de merchandise”.

(Duclot 1898, 63-64)

¹ The terms “Minoan Protopalatial” and “Middle Minoan” are here used synonymously, as the surface pottery dating the studied structures goes back to (and mainly consists of) MM II material, usually seen as the central phase of the Minoan Old Palaces. Even though some of the sites also show earlier and some later material, the dating can only remain approximate, and more detailed dating would require at least a thorough study of the surface material or even excavation. As all the studied sites seem to have existed during the Protopalatial/MM II period, this seems to have been their main floruit which is thus taken here as the period of interest.

² “Oncolithic” is a term introduced by the author in her typology of Minoan Protopalatial mountain architecture built with large stones. The term can be used for more definite descriptions as opposed to usually – and often vaguely – applied terms like “Cyclopean” and “Megalithic”, see Beckmann 2012 passim, definition p. 92.

2 ΠΕΠΡΑΓΜΕΝΑ ΙΒ' ΔΙΕΘΝΟΥΣ ΚΡΗΤΟΛΟΓΙΚΟΥ ΣΥΝΕΔΡΙΟΥ

«Ὁδοὶ δὲν ὑπάρχουν καὶ ἂν συναντήσετε τοιαύτας, ἐξάπαντος θὰ ἀνάγωνται καὶ αὐταὶ εἰς τὴν ἐποχὴν τοῦ βασιλέως Μίνωος, ὅπως καὶ τὰ ἄλλα ἐρείπια».

Daily Paper *Empros*, 5-4-1910: 3 (about a visit to Knossos).³

It is rarely noticed that, until recently, Crete did not have any roads negotiable by wheeled vehicles. This is well documented by 19th-century travellers (Duclot 1898, Bowring 1840). “In general one can go quicker on foot than in any other way” (Bowring 1840: 162) has always been the basic truth about Cretan connectivity until the beginning of the 20th century (and in the mountains much later). The main reason for this difficulty was the rocky, steep, irregular karstic landscape of a mountainous island with slope inclines of 10-35% (as e.g. in the studied area), where the construction of roads for wheeled vehicles was over centuries too challenging to be feasible for more than the most important connections between towns and their harbours.

Minoan roads attracted A. Evans’ interest early on (Evans and Myres 1895), and he returned to the subject in the second volume of the “Palace of Minos” (Evans 1928-1) when he had been looking between Knossos and the south coast for what might have been left of a Minoan trade route. He uses the term “road” more or less synonymously with “track”, looking at main natural passes and lines of passage without actually expecting to see material traces of Bronze Age built roads (Evans 1928-1: Paragraph 35: “Transit Road”).

This makes clear that it is useful to give first a definition of “road” when writing about possible “Minoan roads”.

Definition: A road is here in general: an open way for travel or transportation.

This means two things in detail:

1. Physically: a road is an open length of way, consisting of two basic constituents: the space of the path – and occasionally its parallel edges, often boarded by walls or lines of stones.
2. Functionally: a road is a communication route, independent of its breadth or material quality – and independent of its users.

MINOAN ROADS – UNTIL NOW

The earliest documented Bronze Age roads (in the material sense) in the urban settlements of Gournia (Soles 1979, 151, 155) and Malia (Effenterre 1980, 257 sq., with widths of 0,5-4 m: 258) were dated to MM I-II, while roads in a non-urban area (the Minoan Roads Project of far east Crete and the wider region of Zakros) are first described by Tzedakis et al (1989:49-50). For parts of a stretch of road detected east of the settlement at Malia leading eastward, Müller notes:

“Ils consistent essentiellement en deux rangs de pierres parallèles, formant les bordures de la chaussée, conservées sporadiquement le long du trac (fig. 2). La distance entre eux varie entre 1,60 et 2,00 m. Ces bordures apparaissent de deux manières différentes selon les endroits: soit comme une rangée de blocs grossièrement équarris et dressés de chant,

³ “Roads do not exist, and if you come across some anyway, they certainly have to be attributed, too, to the period of King Minos, like the other ruins”.

soit comme un muret à double parement fait de petits blocs irréguliers, large de 60 cm au maximum”.

(Müller 1991, 545-546)

Other approaches deal with plausible (i.e. notional) passages over large areas of land (see for instance the map in Evans 1928-1, 70), not referring to actual tracks in the landscape, but to hypothetical paths of roads. This also applies to various kinds of “spatial analysis” researching the possible tracks of Minoan lines of connectivity, communication networks (see the contribution by Déderix & Sarris, this volume, Driessen and Frankel 2012), or what is called “Potential Minoan transit roads” by Siart et al (2008:2923, fig. 4) or “Minoan landscape” in general (Argyriou et al. 2017), employing computer based geophysical methods. Here it needs to be noted that purely digital approaches cannot be more detailed than the currently available DEM (digital elevation model) maps, usually based on measured points 90m apart, with the landscape in between interpolated. Clearly such a rough raster is only approximately useful and only when dealing with general approaches, not for the actual landscape.⁴

The main problem of the subject “Minoan roads” appears to be the fact that many researchers seem to have remained predominantly in the line of Evans’ early concept of “Mycenaean Military road[s]” (Evans and Myres 1895), based on the often massive architecture of Minoan sites⁵ near these roads. This has been aptly summarized by Gkiasta when discussing the subject of what the author (Beckmann 2012) calls oncolithic sites:

“Megalithic structures of the ‘guard-post’ type start in the Protopalatial period and whether they are believed to exercise palatial control (Minoan Roads) or seen as parts of defensive settlements in other areas (Nowicki – Lasithi), most researchers read a defensive/military character (also Palaikastro) and may therefore be taken as indication of socio-political conflict and upheaval. We should note, however, Wroncka’s proposal of them serving as rest-posts along routes, fact that demonstrates her different perception of Minoan society as of a peaceful one”.

(Gkiasta 2008, 213)

The “Minoan Roads Project” (best known from Tzedakis 1989, 1990) is described on the website now dealing with the Project’s findings and current work:

The “Minoan Roads” Research Project aims to investigate the overland communications in Bronze Age Crete, comprising the detection, recording and studying of the natural communication axes and the ancient built roads, as well as of the sites relating to

⁴ The possibility of creating a personal DEM based on the 1:5000 military maps of Crete exists but, especially for highly textured surroundings, this means an immense input of work hours, as the isoheights on the maps are often not clear enough to allow a computerized digitization and need to be re-drawn by hand (while even with 4m isoheights there are still imprecisions in the final, again interpolated, DEM!) Talking from experience during the GIS part of my studies, I am certain that the well-known motto “garbage in – garbage out” applies to the currently available (and affordable) DEMs. I learnt the hard way to rely only on the walked landscape, especially after Google Earth showed one Minoan site (actually sitting next to a ridge, SW of it) as being on the other side of the watershed (NE of the ridge) with an actual mistake of ca. 30-50m in the DEM. Until DEM technology advances dramatically in the affordable sector, the problem is hardly going to change.

⁵ Hence seen as “guard-posts” or “watchtowers” vel sim., cf. Beckmann 2012, 85-91.

them. The Project also aims at establishing the patterns of settlement and the character of habitation in the rural hinterland of Crete.

Having started from 1985, the Minoan Roads Project focuses its research on the easternmost part of Crete.⁶

The “easternmost part of Crete” means, until 2017, mostly the area of Zakros, where a network of Minoan roads has been detected and described (ibid.).

The “Minoan Road Project” scholars interpret the close relations between Bronze Age sites and the surrounding road network as an expression of the roads’ need for control or protection, not as the sites’ need for communication. Chrysoulaki (1999, 81) speaks of a “building programme” constructing roads and their protecting “forts” together in the beginning of MM times. While Tzedakis et al. (1990, 61) also allow for the function of “ferme” and “habitat” for some of the sites described (most are called “poste de garde” though, ibid.), the main function of the road system is interpreted as military, not just to control movement on, but even to “control access to roads” (Brabander 2012, 20) themselves – and this as part of a large defensive system. (cf. also Tzedakis 89, 60, for military function, 45 for dating). The “Minoan Road Project” (Tzedakis et al. 1989, 44) 3 types of road are: 1. for communication, 2. for vehicles, 3. military (long distance, straighter, less slope, guarded).⁷

Due to this perspective of interpreting “watchtowers” along roads in far eastern Crete, Driessen can for instance suppose “some kind of confederacy, linked via a road system” (Driessen 2002, 63).⁸ Here it becomes obvious how the supposed military function of Minoan roads by inference from the hypothesized function of Minoan sites near to them has remained mostly unchallenged since 1895 (cf. Beckmann 2012, 86) – and all this only because the said sites had massive foundations.

In opposition to this concept applied to nearly all Minoan Protopalatial (and later) vernacular ruins with massive foundations, the author has demonstrated that in the area of her research, sites must have been agricultural in character, not military or defensive (Beckmann 2012, 183-185).

Thus we can now describe the Bronze Age roads of the settlements discovered by the author on the mountain slopes west of Agios Nikolaos as a network of agricultural and commercial connections between sites and from the settled area to other regions beyond. These connections are traceable mainly towards the East (the coast) and the West (the highland plains of Katharo and Lassithi and the area of central Crete beyond).

This also suggests that the main contemporary Minoan focal settlement in the centre of Mirabello Bay must have been the Minoan harbour town at modern “Priniatikos Pyrgos” (Kalo Chorio, cf. first Hayden et al., 2007), while the Middle Bronze Age settlement history of the

⁶ <http://www.hydraproject.info/en/greece-crete-water-management-in-zakros-area/credits-resources1/> with extensive bibliography (last accessed 31/7/2017).

⁷ Summarized for further attention by Brabander 2012, 20.

⁸ By naming sites «watchtowers» an image of military presence is evoked that changes totally if one describes the same sites as agricultural, sitting along country roads to facilitate the distribution of their produce.

plain of Lassithi contemporary to the settlements discussed here has been known for some time (Watrous 1982, Dierckx et al. 2014).⁹

MINOAN ROADS ON THE MOUNTAIN SLOPES EAST OF AGIOS NIKOLAOS

Some of the ancient looking (often cobbled) roads in the mountains east of Agios Nikolaos¹⁰ were at some point included in a plan for future studies by the “Minoan Roads Project” (Tzedakis 1989, 1990, see above), but this has not been put into action until now (2017).

The Minoan road network of the Agios Nikolaos area was first described by the author (Beckmann 2008, 2012, 2012B). The roads were recorded by following them with a GPS receiver and digitizing them on maps later (for the detailed process see Beckmann 2008). At the end of the author’s studies, an intricate road network could be shown (Figs. 1, 2).

As these roads are in many cases related to and defined by Minoan enclosure walls (*perivoloï*),

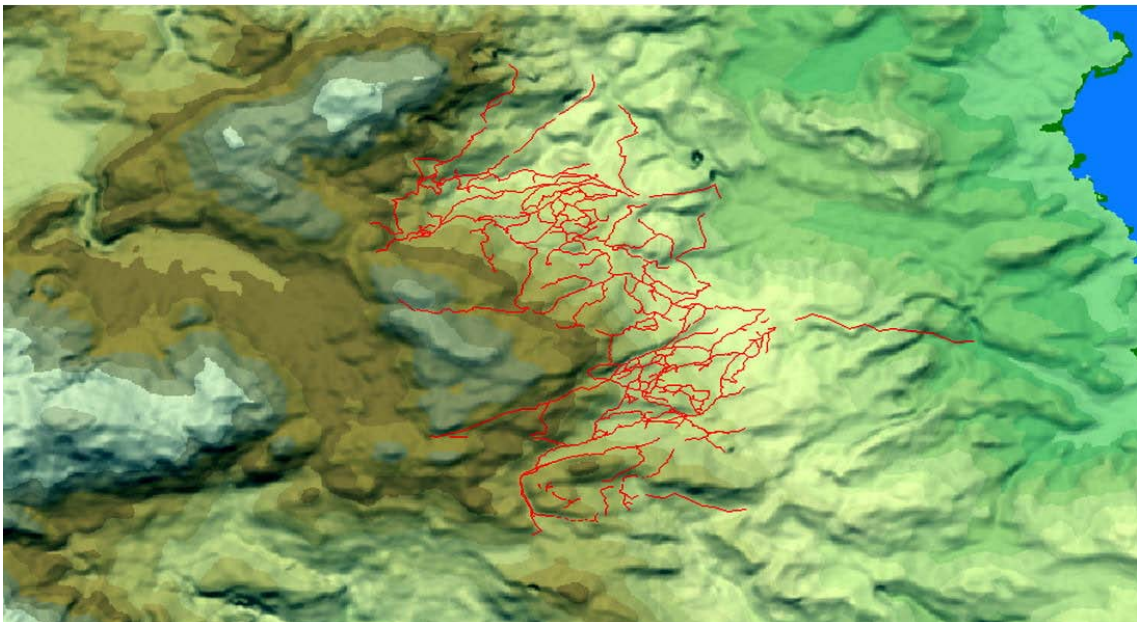


Fig. 1. Minoan road network in the area west of Agios Nikolaos (situated top right at the coast).

they first need to be described: constructed in a similar architecture as the dwelling ruins, they are hundreds of meters long with a width of between 0.7 and 1.2 m, traversing the landscape in often still amazingly well-preserved shape. These walls (370-2,150 m long) systematically surround the dwelling sites including various sizes (from under 1 to over 15 ha) of rocky and partly arable land, thus associating by their position the enclosed areas with the dwellings. The closer to the dwelling, the more massive and carefully constructed the enclosures.

⁹ Here it should be noted that the Lassithi plain seems to have been part of the Malia “state” sovereign territory during Protopalatial times, cf. Betancourt 2007, whereas pottery in the author’s study region clearly belongs to a wider “Mirabello” tradition, cf. Beckmann 2012, Ch.II c, mainly due to the abundant use of grano-diorite temper (as occurs frequently in the Kritsa area, cf. *ibid*).

¹⁰ One of which was described first by A. Evans as a “Mycenaean military road” (Evans and Myres 1895, i.e. before Evans coined the term “Minoan” for the Cretan Bronze Age culture), see below.



Fig. 2. The study area with sites (white dots) and roads (orange lines) with surrounding large Minoan sites and regions.

Often additional small areas in various shapes and positions are walled, closer to the dwelling sites, thus creating smaller ranged terraced spaces or rather level expanses, probably to be interpreted as walled fields or animal pens depending on the particular situation (cf. Beckmann 2012b, 38-39).¹¹

When Evans first passed along one of the major ancient roads of the area, he misinterpreted the accompanying structures of a site he passed (Beckmann 2012, Site 95, see Figs. 3 and 4), but did not recognize as such. He describes road and enclosure walls thus:

... the remains of a vast primeval fortification intended to protect the defile against an enemy coming from below. Two walls ran parallel to and near the ancient road, flanking it on either side; and from the lower end of these, above and below, two other walls

¹¹ The area contains today traces of ca. 200kms of enclosure walls, i.e. ca. 240,000m³ of originally built walls (their original height estimated at ca. 1,3 m. For comparison: the building volume of the Egyptian Menkaure/Mykerinos pyramid is ca. 235.000m³). Their cost in the first decade after 2000 A.D. would have been ca. €30 million.



Fig. 3. Beckmann Site 95. Inner perivolos at the old road opposite dwelling ruin (left, looking uphill along the road) and Outer Perivolos running uphill as seen from the road.

branched off at right angles [...] A breastwork was thus formed some two hundred yards long with a passage for the road [...] it must once have been a stupendous work.

(Evans 1895 as given in AJA 1895: 401)

What he actually saw on that road leading towards Mirabello Bay from the Katharo plain was what can still be seen just a few meters north and north-east of the author's Site 95 (Beckmann 2012: 86-87), a nearly invisible dwelling ruin with very little pottery on the surface. Here several enclosure walls, the Inner (along the road opposite the dwelling ruin, left in Fig. 3) and Outer Perivolos (right in Fig. 3, turquoise in Fig. 4) are well preserved and massive (due to their position close to the dwelling – see above).

Otherwise none of the Minoan roads in this area seems to have been described until now.

GENERAL ASPECTS

Various kinds of road in widths up to 2m (and a cumulative length of ca. 150km) often run along *perivolois* or through the space left between two of them (Fig. 7), thus connecting the dwellings with each other and with the main through roads. Their position and way of construction seems to presuppose central planning, without which a systematic network of the kind comprehensible in this area (for details see Beckmann 2012 *passim*, cf. Figs. 1 and 2) would hardly be possible, and it seems very improbable that individual farmers would have synchronized and/or co-ordinated their projects so meticulously (cf. Nowicki 1998, 36). This fact proves even without further study that the sites connected by this network were not independent farm installations, but belonged

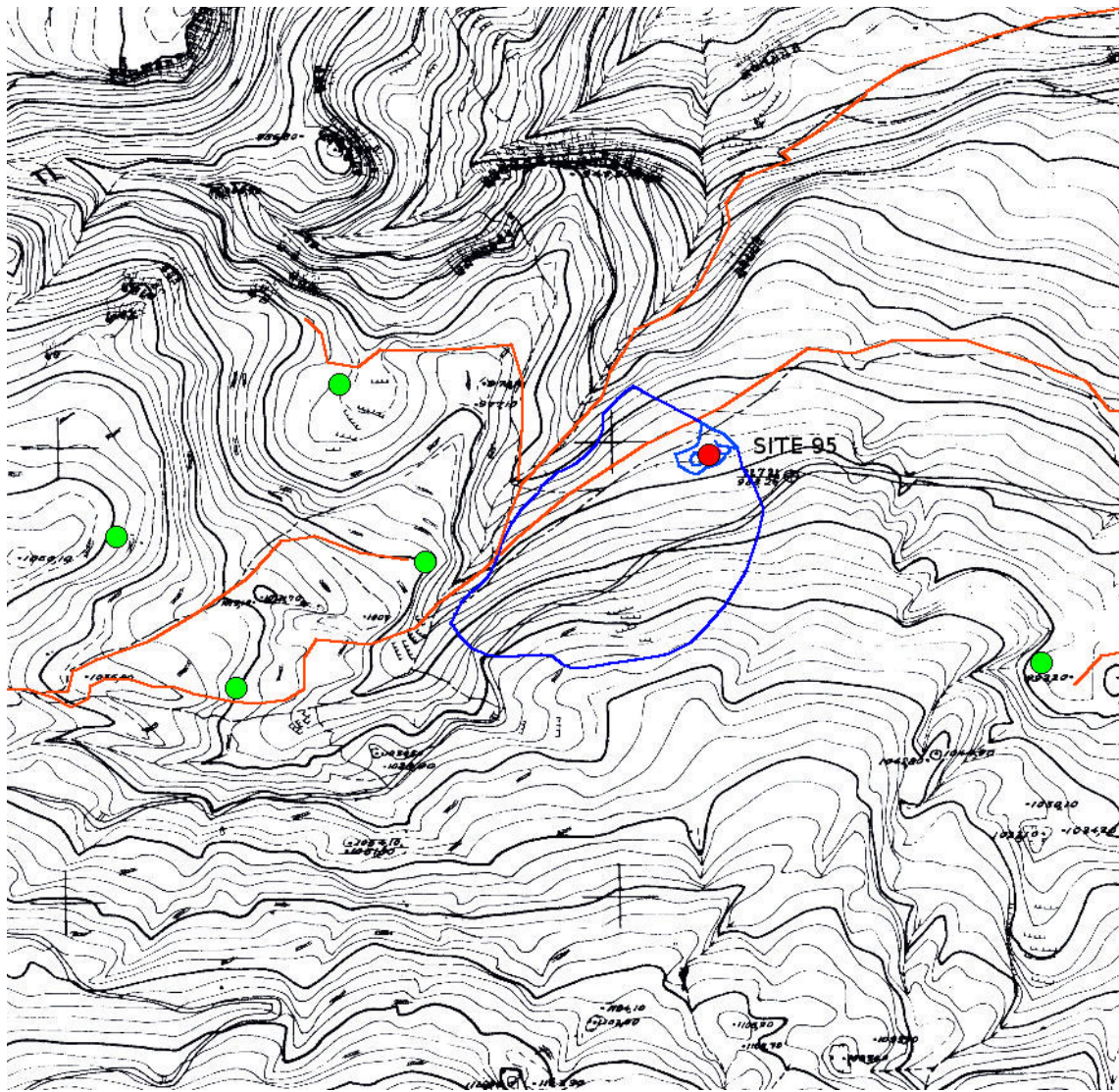


Fig. 4. Minoan roads (orange), sites (green, Site 95 red) and enclosure walls at Site 95 (blue) in the area Evans saw in 1895.

in some way to an administration and/or authorities, most probably those of the Minoan town situated at “Priniatikos Pyrgos” (Fig. 2), the closest coastal settlement.

The broader paths of the mountain area seem to have been in use at least since the Bronze Age,¹² and in several parts of the studied region two more or less parallel tracks (Fig. 5) can be seen (Beckmann 2012, 159).

Various road widths and conditions can be classified thus (following Beckmann 2012, 160-164):

Road Type 1: ca. 2-3m (two loaded donkeys can pass each other). This road nearly always has two built shoulders (Fig. 7), and is sometimes later re-used as kalderimi. Roads of this type are always long through roads, connecting the area to outer regions and many sites with others. Its original older track can sometimes be seen (in short sections) as running parallel or close to

¹² The dating of roads like this is usually done according to the oldest known sites connected by them (Shaw 1977, 202 no. 8; Tzedakis et al. 1989; Müller 1991).



Fig. 5. Traditional winding mountain road (left, turning to right in background) and an earlier (possibly Bronze Age) track (right) with parts of its (mainly re-used) shoulder preserved (in foreground right).



Fig. 6. Minoan enclosure wall (under the girl) with road along its uphill side, probably cleared by constructing the wall. South of Site 106 (Beckmann 2012).



the later versions of the road (Fig. 5). Often patches of pavement (rubble) seem to have existed, mainly in very rocky areas to level the road surface.

Road type 2: ca. 1-1.5m (one loaded donkey can pass a human). This kind of road has sometimes built shoulders (Fig. 8), especially in sloping terrain, where the lower shoulder would be built, the upper just cleared (Fig. 6). These roads may be through roads, but can be seen mostly connecting sites (or sites to through roads). Sometimes they seem to be cul-de-sacs (which might be a problem of visibility). Pavement is sometimes visible (mostly as small rubble).

One might also assume a: Road type 3: 0.5-1 m (one loaded donkey

Fig. 7. Minoan road type 1 running between two enclosure walls (at blue Vs), connecting Sites 60 and 61 (Beckmann 2012), to north-east.



Fig. 8. Minoan road type 2 with 2 built shoulders (not part of enclosure walls) and traces of pavement (now at a raised level). South-west of Site 54 (Beckmann 2012).

or human can pass), but there seems to be no clear archaeological evidence for this kind of path because there are no shoulders except in terrain where the track would be disrupted following landscape recesses

(Fig. 9). Thus these smallest roads are hard to pinpoint as today they look like tracks just cleaned of rocks used by passing animals. Those conjectured to be Minoan are cul-de-sacs, leading to one dwelling ruin only, while many such paths exist in the area that may not be ancient.

None of the roads known in the area ever strictly follows one type: type one roads can reach widths of 4 m in places, but even smaller roads become larger here and there (depending on the topography), and their shoulders – more explicitly oncolithic – close to sites.

Another kind of typology could be – independent of the width or architectural elements – based on the functionality of a road (this typology has the inherent problem of the subjective interpretation of the archaeologist, as every suggestion of function). One such function would be, for instance, the “through road”, several of which can be suggested for the area studied by the author (see for example map Fig. 10). Another function, more on a small scale, could be e.g. that of

a road dubbing as check-dam (example Fig. 11).



Other characteristic variations / features in Minoan roads of the mountains west of Agios Nikolaos are the following:

Fig. 9. Suggested example of a Minoan road type 3 (Beckmann 2012, 162) between Sites 39 and 40, probably ending at 39 (some 70m above).

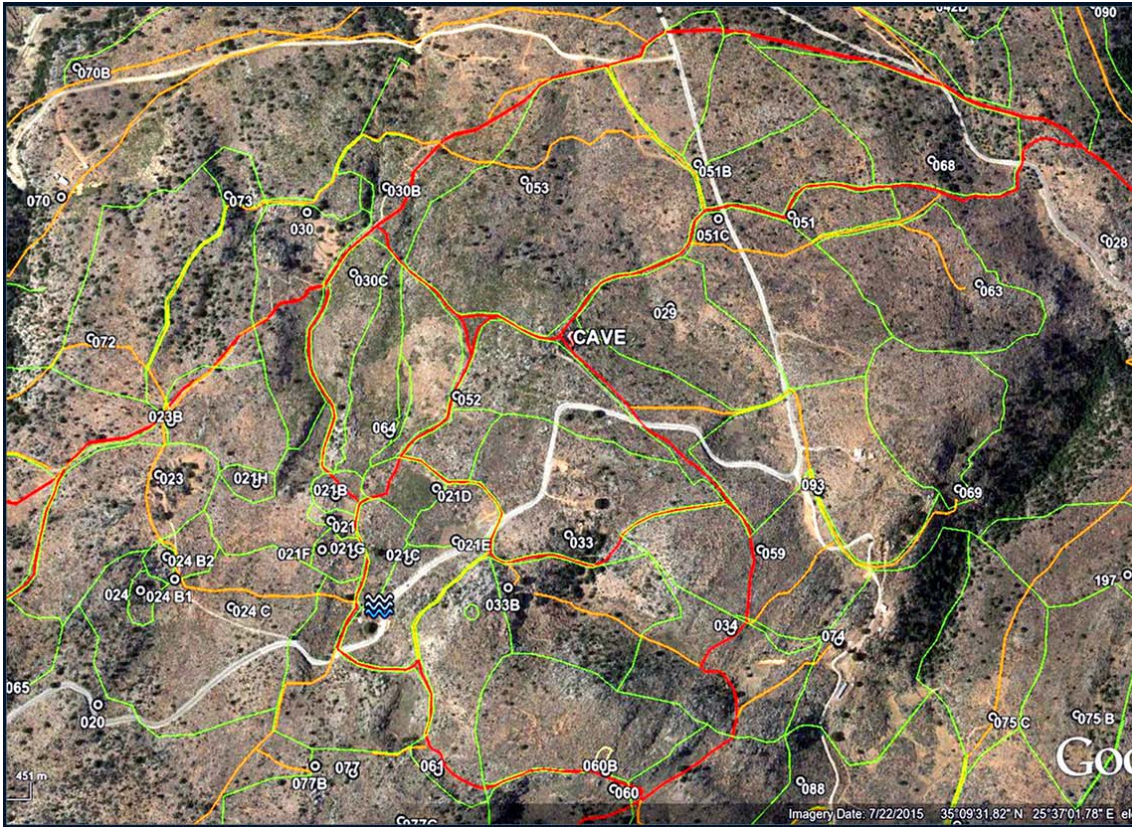


Fig. 10. Part of the author's study area (west of Kritsa). Minoan sites numbers. Roads orange lines, probable through roads red lines, perivoloi green lines, note where roads are framed by enclosure walls.



Fig. 11. Minoan road through an ancient (obviously before the construction of the road) winter-runoff, forming a kind of check-dam. The upper wall is part of the northern perivolos of Site 30C (ca. 70m to west, see Fig. 7 north-west of cave, Beckmann 2012).



Fig. 12. Road part running along the inside (upslope) of an enclosure wall (north of Site 85, Beckmann 2012).

Road running on the inside of an enclosure – with only one built wall visible (the enclosure wall), often seen on the

downslope side (Fig. 12), but sometimes on the upslope side, too (cf. Fig. 6).

Road (important, or through road) without shoulders, due to the topography, i.e. where the construction of shoulders is not necessary for some reason, like bedrock on both sides (Fig. 13).



Fig. 13. Road (type 1) without built shoulders (probably due to special landscape conditions) running east-west between Sites 60 and 61 (Beckmann 2012). See Fig. 6 for its continuation to north-east.



Fig. 14. Minoan road passing an enclosure wall (from left to right) at right angles (west of Site 87, Beckmann 2012).

Road passing a perivolos wall at right angles (Fig. 14).

Road with steps or stairs (both exist in the region studied, cf. Fig. 15).



Fig. 15. Road with traces of stairs, leading down a steep slope (the grassy part lies ca. 2.5- 3m below the foreground) to wards Site 173 (Beckmann 2012) now part of the Blue Path in Kroustas Park (see the park's website www.kroustas-park.gr).



Fig. 16. Road with runoff channel in front of Site 95 (Beckmann 2012), the site described on p. 8 . The surface was probably reworked later, but the channel may be Bronze Age.

Road with rare details like a runoff channel (Fig. 16).

Naturally one has to keep in mind that because of the rocky relief of the landscape, many of the roads must have been in use for thousands of years as passages, especially in passes where there is no other physical route. Dating is hence only possible in a relative way (see above).

When I started my studies in such a remote area I never expected to find such a well-organized network connecting so many sites with so many built enclosure walls – I still find it stunning.

Roads have been connecting people with the landscape, and that has been true since the beginning of time. Independent of how they were used.

Modern times have changed that just a little. And each road has its own story (*ο δρόμος είχε τη δική του ιστορία*).

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