Settlement Structures in Prekmurje from the Air

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Izvleček

Arheološko zračno rekognosciranje Prekmurja se sistematično opravlja od leta 1997. Doslej je bilo odkritih 90 arheoloških najdišč. Najdišča so opredeljena po obliki struktur, ki se na zemeljskem reliefu kažejo kot vegetacijski znaki. Odkrita so bila gomilna grobišča, naselbine, rimska vila in komunikacije, ki sodijo v različna arheološka obdobja. Največ arheoloških zapisov je bilo zabeleženih na območju med Muro in Ledavo; največja koncentracija je ob potoku Doblu, ki teče v bližini Murske Sobote.

Abstract

Systematic archaeological aerial reconnaissance of the Prekmurje region is underway since 1997. Ninety archaeological sites have been reconnoitered up till now. The sites are classified according to the shapes of the structures that are manifested on the geographic surface as cropmarks. Tumulus necropoli, settlements, Roman *villae* and communications routes, all attributed to various archaeological periods, have been discovered. The majority of archaeological records were documented in the region between the Mura river and Ledava; the largest concentration lies along the Dobel stream that flows near Murska Sobota.

INTRODUCTION

The aerial archaeology training week held between June 15 and June 22, 1996, near Siófok, Lake Balaton, was rudimental and provided competent schooling for the comprehension and development of aerial archaeology in Slovenia (Beweley, Braasch, Palmer 1996, 745-750). Aerial archaeology is acknowledged as equal to other archaeological and research methods throughout western Europe. It represents the basis for researching the settlement of and the protection of historical, natural, as well as archaeological regional monuments. Its origins reach back to the time of the first balloons. The first airplanes, above all, had a strong effect on the development of aerial archaeology. Photographs of regions that were captured during military operations throughout the First and Second World Wars composed a valuable database of archaeological information and it enabled archaeologists to analyze, by interpreting the snapshots of Europe as well as the Near East, the archaeological monuments that disappeared or were only recently discovered.

The most merit should by all means be awarded to O. G. S. Crawford, also known as "the father of aerial archaeology" by the English. Published in 1920, his book, *"Wessex from the Air",* was a revolutionary accomplishment in the field of English archaeology as, for the first time, archaeologists could view an archaeological site in its entirety (Bewely 1997, 10-21).

Aerial photo archives did not augment in countries of the former communist and socialist social system (eastern European countries) where the airspace was closed. Aerial photos that were filed as strictly confidential were also difficult to access. Thus aerial archaeology failed to assert itself.

Aerial archaeology, today, is supported by highly developed research groups in the United Kingdom from within the framework of the RCHME. The Aerial Archaeological Research Group (AARG) is a very active and independent group of aerial archaeologists that unite members from various countries and publish *the AARGnews (The Newsletter of the Aerial Archaeology Research Group).* Likewise, numerous centers and groups that deal with aerial

archaeology are established in France, Belgium and Germany. Following the aerial archaeology training held near Siófok, an aerial archaeology group, led by Martin Gojda (Gojda 1997), was established within the complex of the Institute for Archaeology in the Czech Republic, as well as a very active group of aerial archaeologists from Slovakia (Kuzma 1995, 251-258) and Hungary, where it is mainly the French who fly (Gougey, Szabó 1995).

Slovene archaeologists also learned impressive amounts on the subject of aerial archaeology during the above mentioned training; furthermore, it also marks the beginning of the development of this discipline in the Slovene region.

WHAT IS AERIAL ARCHAEOLOGY?

Select universal methodological guidelines for aerial archaeology in Slovenia have already been presented (Grosman 1996, 47-50), even aerial archaeological survey, the standard operating procedure and the publication of aerial photographs from the Prekmurje region, as well as the sensation that the aerial archaeologist experiences in the air, have been described (Kerman 1996, 20; Kerman 1998, 46).

The concept of aerial archaeology ordinarily incorporates aerial survey, photography, photo-interpretation and the mapping of archaeological features.

Aerial archaeology must ultimately be defined as a discipline that includes examinations of the landscape from the air and gathers data conducive for further archaeological and historical studies as well as for the protection of historical monuments throughout the landscape. Aerial archaeological survey is a very efficient and relatively quick and nondestructive manner of documenting archaeological structures (ruins) from the air: they appear as positive or negative reflections (cropmarks) in crops and pastures and they are perceived on the basis of differences in the color of soil (soilmarks) in tilled ground.

Light and shade factors are consequential for the discovery of archaeological sites that are barely visible on the ground. Aerial archaeologists seek to determine their contours amid extremely low lighting conditions. Consequently, the best time for such photos is in the early morning and in the late afternoon. These same time intervals are valid also during winter months. Another significant factor in aerial photographs is the amount of total plant cover across the landscape, which varies depending upon the type of vegetation. The best results are attained in grassland and in fields sown with cereals. Structures are much less visible in fields sown with beet sugar or corn, as these two cultures are sown at larger spatial intervals than cereals, for which dense growth is characteristic.

Inclined photos are shot from the air through an open window of a two-seater or four-seater airplane by the archaeologist using the customary films (black and white and diapositive films) and a handheld camera. The airplane can be rented at the local recreational airport. Inclined photos are the best for registering individual sites or regions of historical significance. The advantage lies in the fact that the photographer can choose the most appropriate moment of the day and the type of lighting necessary, a significant factor for a good photograph, for the poorly visible contours of archaeological structures to materialize on the surface through crops in the shapes of circular, semicircular, square or straight ditches that can be indicative of cemeteries, enclosures, settlements, encampments or communications.

THE EXPERIENCE IN THE PREKMURJE REGION - SHAPES OF SETTLEMENT STRUCTURES FROM THE AIR

The Prekmurje region is geographically divided into the level country between the Mura river and Ledava, to the first tertiary Goričko terraces, as well as the hilly world where the ridges are usually settled and marked with forests, and rivers flow through the valleys (Ilešič 1935, 5-12). Numerous factors diminish visibility and the recognition of archaeological structures on the earth's surface (*fig. 1*): the agricultural surfaces that are divided into smaller segments, the diversity of cultures sown in the fields, the insufficient amount of grassland, various irrigation and improvements of the land, as well as the drainage of old river courses. The level country between the Mura and Ledava is assuredly the most favorable for aerial survey. Archaeological structures in the Goričko region are difficult to investigate from the air because the terrain is so hilly and quite forested, and settlement is only possible along the larger riverbeds, such as in the region between the Mala Krka and the Velika Krka rivers.

Systematic archaeological aerial survey of the Prekmurje region is underway since 1977. Ninety archaeological sites have been discovered up to this time, with a total of 60 hours of flight. Nevertheless, not enough flight hours have accumulated to

enable systematic survey of the landscape during all four seasons; flights during the winter, when results would be quite favorable, are lacking in particular. Fortunately, an airport is situated near Murska Sobota and flights can be arranged at any time and in any weather, thus enabling the desired region of the landscape to be flown over at each change of weather and position of the sun. None of the more important archaeological institutions in Slovenia (the Department of archaeology on Filozofska fakulteta, the Institute of archaeology ZRC SAZU, the Institutes for the Conservation of the Natural and Cultural Heritage) embody an aerial archaeology department or group to commission and also direct a register of sites documented from the air, and to systematically survey all the regions as well as to secure the necessary financial means for aerial survey. Aerial archaeology ought to be the prospective objective of Slovene archaeology. The Provincial Museum in Murska Sobota (Pokrajinski muzej Murska Sobota) currently manages the aerial register of archaeological sites in the Prekmurje region; no facts are known for the other regions in Slovenia.

The Prekmurje region is one of the few in Slovenia that has executed an archaeological topographic survey for the entire region; it now serves as an excellent foundation for further archaeological investigation of the landscape (Šavel 1991). Known sites were disregarded during the aerial archaeological survey so as to avoid being misled. The landscape was considered as a whole, ready to be discovered anew. The entire landscape of the Prekmurje region is systematically surveyed during all four seasons of the year. The best archaeological data and results were attained primarily in the segment between the Mura river and Ledava. The largest concentration of archaeological sites appeared along the Dobel stream that flows near Murska Sobota.

The archaeological sites discovered from the air shall be classified typologically according to the shape of the structure that can be seen as a cropmark on the earth's surface (circles, semicircles, squares and rectangles, straight ditches and smaller circles). Chronological determinations are only tentative as they are difficult to evaluate, considering that field surveys and excavations have yet to be carried out on any of the sites. An interpretation of the sites was only possible on the basis of published photographs of similar archaeological structures that had also been excavated. The archaeological structures were traced by hand from the original photographs to simplify the interpretation process.

The most frequent archaeological cropmarks are smaller circles measuring between 20 and 25 m in diameter. The width of the ditch in lush vegetation is up to 2 m (*fig. 2*). The larger circles measure 35 to 40 m in diameter; the width of the ditch in lush vegetation measures up to 1 m (*fig. 4; 6; 7;*). Semicircular ditches (ringed) measure 20 m in diameter. The width of the ditch in lush vegetation measures up to 2 m (*fig. 2; 9-12*).

Cropmarks shaped as squares or rectangles are very frequent. There are three types: the smaller square type measures between 12 and 15 m with a ditch that measures up to 2 m wide in lush vegetation (*fig. 9; 10*), the square type that measures up to 30 m with a ditch of up to 3 m wide in lush vegetation (*fig. 8; 13*), and the large square type with an opening (an entrance) measuring between 60 and 70 m and with a ditch that is up to 8 m wide in lush vegetation (*fig. 19; 20*). Another type of cropmark is composed of two equal and lateral squares, with diameters measuring 40 m and ditches that measure between 3 and 4 m wide in lush vegetation, and a smaller square measuring up to 25 m in diameter and with a ditch of up to 4 m wide in lush vegetation (*fig. 18*). There are also rectangular cropmarks, as positive vegetational marks, measuring 90 m x 30 m and with a ditch of up to 4 m in width in lush vegetation (*fig. 17*), as well as rectangles as negative vegetation marks (*fig. 14*).

Long and narrow ditches of up to 1 m in width (*fig. 16*) were also recognized, as well as ditches measuring up to 2 m wide with rounded off corners (*fig. 15*).

The current stance of research within the region, if taken into consideration, can help to chronologically determine archaeological sites surveyed from the air.

Prehistory

The oldest occupancy of the region along the Mura reaches back to the Late Stone Age and the Copper Age. Settlements attributed to the Lasinja culture were discovered at Bukovnica, Filovci, Dobrovnik, Kobilje, Mlajtinci, Gomilice, Puconci, Korovci, Lendava and Brezovica. The distribution of sites indicates that settlement was concentrated in the lowland region of Prekmurje, primarily along the lower part of the Ledava stream and its tributaries. Of the above mentioned settlements, only Bukovnica was systematically investigated. The settlement expanded spatially over time. Rectangular, wooden houses plastered with loam were

discovered. Hearths and large pits were found in the open (Šavel 1991, 13; Šavel 1994, 39-50).

The settlement pattern changes in the Bronze Age, settlements arise in new surroundings. The following settlements are known dating to the Middle Bronze Age: Oloris near Dolnji Lakoš, Gaborkert near Lendava, Gosposka near Hotiza and Prapornica near Gančani. Several years of systematic archaeological excavation of the settlement at Oloris near Dolnji Lakoš produced desirable results concerning the architectural remains. Numerous structures (houses) were discovered, measuring 10 x 6 m, that were constructed using vertical, wooden posts interwoven with branches and plastered with loam. The settlement was naturally confined by a 2 m wide ditch (Šavel 1991, 15-16; Šavel 1994, 56-57).

Settlements dating to the Iron Age are very scarce. Some Late La Tčne graphite pottery was unearthed at the Bronze Age settlement of Oloris near Dolnji Lakoš. The slightly elevated region of Duge njive near Trnje (measuring 300 x 300 m, it is enclosed by a marshy trench, access is possible only from the eastern side) and the elevated plateau in the center of Černelavci, where graphite pottery was discovered during probe excavations, are potential Iron Age settlements (Šavel 1991, 16-17).

It is evident from the present stance of investigations on Prehistoric settlements that the majority were situated along riverbeds or in marshy areas which were enclosed by natural ditches, and they represented some sort of islands within the flooded areas. Rectangular structures (houses) built with wooden posts dug into the ground prevail. No ritual or ceremonial structures, or even cemeteries, have yet been found.

Archaeological sites seen from the air infer a different Prehistoric settlement pattern. The group of circular ditches along the Murska Sobota-Bakovci main road (*fig. 2*) can be identified as Prehistoric tumuli. The group is composed of four circular ditches of which two circles are connected by a crossing from one circle to the other, with a visible hole dug out in the center as well as a side entrance. The ditch on the left is incomplete and is of a semicircular, ring shape. The fourth circular ditch is on the right and also has a distinctive entrance and a visible hole dug out in the center. Rectangular pits are recognizeable to the side of the circular ditches.

A circular ditch with a smaller circle in the middle was discovered southwest of Petišovci and could also be assessed as a cemetery surrounded by a ditch (*fig. 3*).

An archaeological site bearing a characteristic circular ditch, situated north of the village Kupšinci, can also be classified as a ceremonial location. Smaller circles, the remains of postholes, are distributed symmetrically and circular within (*fig. 5*).

Prehistoric settlements that are enclosed by a larger ditch, measuring between 35 and 40 m, are very frequent. One was discovered in the fields southwest of Murska Sobota, situated along a former riverbed. A smaller circular ditch a slightly beyond corresponds to this larger one. The remains of trenches dating to the First or Second World War zigzags between the larger and the smaller circles (*fig. 4*). A similar settlement that is also enclosed by a larger ditch and is additionally protected with a trench above and below, was discovered south of Murska Sobota (*fig. 6*). The settlement at Mostje (*fig. 7*) is different in that it was encompassed by a rampart with two entrances, one from the east and one from the south. Numerous circular holes that were dug out in the middle of the settlement are recognizeable.

Square ditches together with smaller, semicircular ring-shaped ditches compose a specific Prehistoric settlement type. These settlements are known along the Dobel stream in Krog (*fig. 8*), west of Bratonci (*fig. 9*) and at Beltinci (*fig. 10*).

The Roman Period

Tumuli cemeteries demarcate the Roman period in the Prekmurje region; 77 have been documented up to this time. Tumuli are situated individually as well as in groups. The smaller tumuli measure up to 6 m in diameter, while the larger ones up to 25 m. Ten settlements have been documented dating to the Roman period. The settlement at Dolga vas was archaeologically investigated only partially. Smaller excavations were also carried out at Ižišče near Ivanci. The laying out of the Roman road traversing the Prekmurje region from Kot to Dolga vas and beyond towards Zalalovoj, Sopron and Szombathely, was thus revealed (Šavel 1991, 17-21; Pahič 1972, 11-20).

Groups of circular ditches, some of which are ring-shaped, unjoined semicircular forms, prevail among the archaeological sites discovered from the air and dating to the Roman period. Two such larger groups of circular ditches were discovered south of Murska Sobota (*fig. 11; 12*) as well as north of Krog (*fig. 13*). The group of circular ditches near Murska Sobota could possibly correspond to two larger Roman tumuli cemetery complexes. Likewise can be surmised of the group of circular ditches north of Krog, where two square ditches

pertaining to a building structure were revealed; they could possibly be indicative of the settlement's multiphase character.

The Roman villa discovered south of Murska Sobota (*fig. 14*) along an old dried up riverbed can certainly provide insightful information regarding the manner of urbanizing Roman lifestyle in the countryside. The villa is composed of an oblong building facing another building with numerous intermediate spaces and a smaller additional space on the right side.

Although the Prekmurje region was of a transitional character during the Roman period, it nevertheless had to be subjugated, as did all other provinces constituting the Roman empire, and it had to defend the empire. Ditches with rounded off corners, observed from the air in Lemerje (*fig. 15*) and at Rakičan (*fig. 16*), are most likely the remains of Roman military fortifications.

A large number of architectural remains were discovered from the air and are difficult to precisely evaluate whether they chronologically pertain to the Roman period or to the Middle Ages. A ditch pertaining to a large two-part oblong, rectangular building (*fig. 17*) was recognized in the field south of Kupšinci. Two larger square ditches and a smaller square ditch pertaining to a building structure, residence or fortification, observed northwest of Bratonci (*fig. 18*), can also be attributed to the Roman period. Discovered south of Murska Sobota, a wide, rectangular ditch pertaining to a building with an entrance could perhaps be the remains of a Roman or a medieval fortification (*fig. 19*). A ditch pertaining to a square building, north of Pušča (*fig. 20*), can be interpreted likewise.

An elaborate road system once extended over the Prekmurje region (Horvat-Šavel 1985, 163-175; Zelko 1962, 23-24, 27). The remains of former roads were observed from the air southeast of Črenšovci (*fig. 21*), at Beltinci (*fig. 22*) and at Ižakovci (*fig. 23*).

A review of the aerial archaeological photographs from the Prekmurje region thus enables new prospects concerning the archaeological depiction of the landscape. Despite that aerial archaeological photographs might not be adequately convincing and that interpretations may be difficult to substantiate, I believe that this method maintains exceptional potential for the comprehension of landscape archaeology.

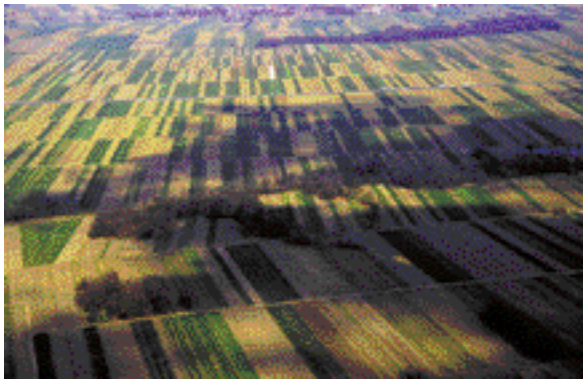

Fig. 1 / sl. 1

Fig. 2 / sl. 2

A CATALOGUE OF AERIAL PHOTOGRAPHS AND A CORRESPONDING INTERPRETATION

Prekmurje (*fig. 1*)

The lowland region of Prekmurje; with agricultural surfaces that are divided into smaller segments and various crops in the fields, aerial survey is rendered more difficult.

Photo: B. Kerman, 24. 3. 1998.

Murska Sobota (*fig. 2*)

A group of circular ditches representing Prehistoric tumuli; two of which are connected with a crossing from one circle to the other, which has a hole dug out in the center and a side entrance. The ditch on the left is incomplete and is of a semicircular, ring shape. The fourth circular ditch is on the right and also has a distinctive entrance and a visible hole dug out in the center. Rectangular pits are visible to the side of the circular ditches. The circles, or rather tumuli, are located on an elevated area (an island), and old riverbeds are visible in the surrounding area. Construction work and the expansion of the Murska Sobota-Bakovci main road is already endangering the site.

Cropmark - inclined photo.

Photo: B. Kerman, 9. 6. 1998.

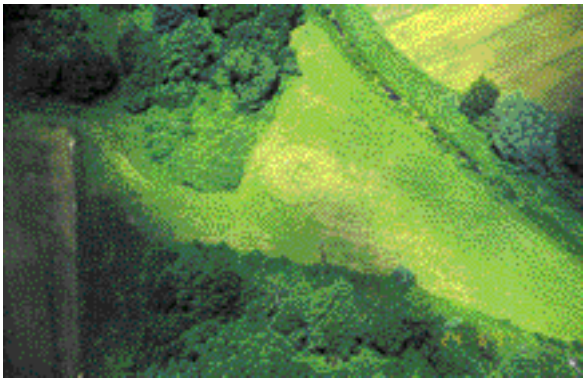

Fig. 3 / sl. 3

Petišovci (*fig. 3*)

A larger, circular ditch, within the middle of which a smaller circular hole can be recognized. The site is situated along a riverbed and most likely represents the remains of a Prehistoric cemetery with a central grave that is enclosed by a circular ditch.

Cropmark - inclined photo.

Photo: B. Kerman, 24. 6. 1997.

Fig. 4 / sl. 4

Murska Sobota (*fig. 4*)

A large circular ditch of a Prehistoric settlement on the right, a smaller circular ditch on the left. The remains of trenches dating to the First or Second World War zigzag between the larger and the smaller circles.

Cropmark - inclined photo.

Photo: B. Kerman, 9. 6. 1998.

Fig. 5 / sl. 5

Kupšinci (*fig. 5*)

A large, circular ditch, within which the contour of a circle composed of symmetrically distributed smaller circles (holes) is visible. Two smaller circular ditches are still visible to the left, as well as a circular ditch to the right. The site could perhaps be a burial or ceremonial complex.

Cropmark - inclined photo.

Photo: B. Kerman, 6. 2. 1996.

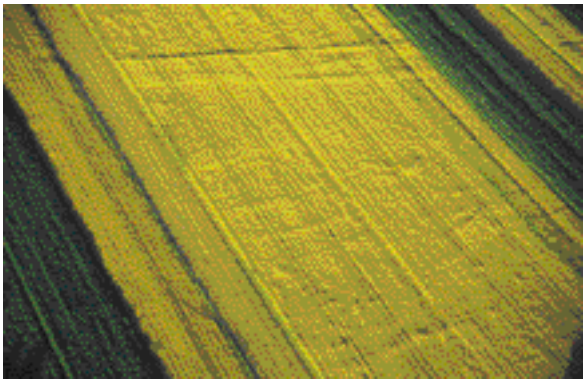

Fig. 6 / sl. 6

Murska Sobota (*fig. 6*)

A large circular ditch of a Prehistoric settlement that is additionally confined with a trench above and below. Straight horizontal trenches are situated above the circular ditch of the settlement.

Cropmark - positive photo during an extremely low sunlight factor.

Photo: B. Kerman, 3. 7. 1997.

Fig. 7 / sl. 7

Mostje (*fig. 7*)

A circular ditch or rampart of a Prehistoric settlement with two entrances, one from the east and one from the south. Numerous small, circular holes were dug forming an ellipse within the settlement.

Cropmark - inclined photo.

Photo: B. Kerman, 10. 6. 1998.

Fig. 8 / sl. 8

Krog (*fig. 8*)

Two square enclosures (ditches) are on the lower part and three circular ditches that could possibly be Prehistoric tumuli, or enclosures, are above.

Cropmark - inclined photo.

Photo: B. Kerman, 3. 7. 1997.

Fig. 9 / sl. 9

Bratonci (*fig. 9*)

Above are the remains of a ditch pertaining to a rectangular building; the semicircular ring-shaped ditch of a tumuli, or enclosure, with numerous holes dug before the entrance, is in the middle. Another semicircular ditch of a tumulus, or enclosure, is adjacent.

Cropmark - inclined photo.

Photo: B. Kerman, 3. 7. 1997.

Fig. 10 / sl. 10

Beltinci (*fig. 10*)

The ditch of a rectangular building with an entrance, which most likely pertains to a semicircular ring-shaped ditch, as well as an oblong and wide ditch on the right.

Cropmark - inclined photo.

Photo: B. Kerman, 3. 7. 1997.

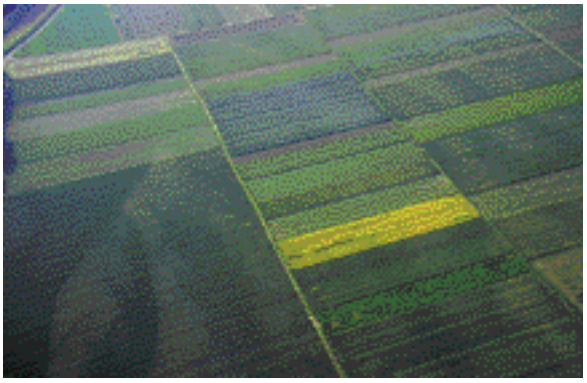

Fig. 11 / sl. 11

Murska Sobota (*fig. 11*)

A group of circular and semicircular ring-shaped ditches - the remains of a tumuli necropolis.
Cropmark - inclined photo.
Photo: B. Kerman, 9. 6. 1998.

Fig. 12 / sl. 12

Murska Sobota (*fig. 12*)

Two groups of circular and semicircular ring-shaped ditches - the remains of a tumuli necropolis.
Cropmark - inclined photo.
Photo: B. Kerman, 5. 6. 1998.

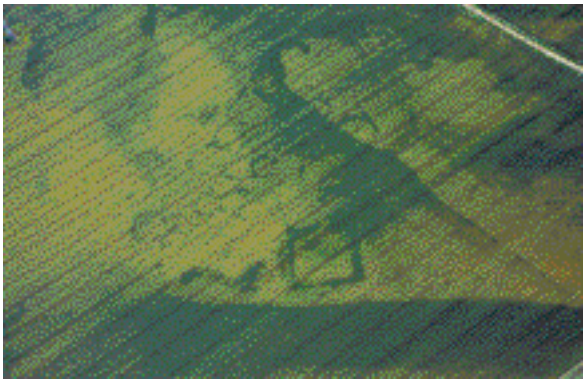

Fig. 13 / sl. 13

Krog (*fig. 13*)

A group of circular and oval ditches, most likely a tumuli necropolis, that is concluded above and below by two rectangular buildings with entrances.
Cropmark - inclined photo.
Photo: B. Kerman, 9. 6. 1998.

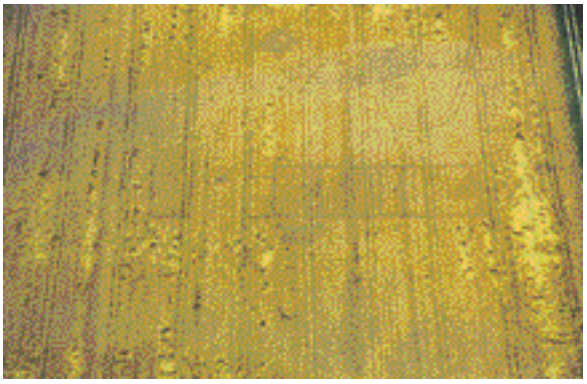

Fig. 14 / sl. 14

Murska Sobota (*fig. 14*)

A negative impression of the walls pertaining to a Roman villa composed of an oblong building facing another building with numerous intermediate spaces and a smaller additional space on the right side. The Roman villa is situated along a dried up riverbed.
Cropmark - inclined photo.
Photo: B. Kerman, 7. 7. 1998.

Fig. 15 / sl. 15

Lemerje (*fig. 15*)

A wide ditch with rounded off corners; probably the remains of a Roman military encampment.
Cropmark - inclined photo.
Photo: B. Kerman, 9. 5. 1998.

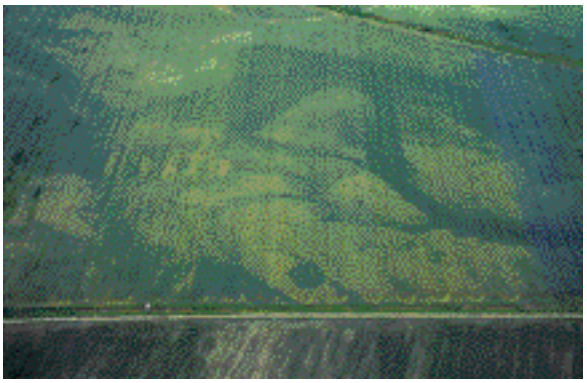

Fig. 16 / sl. 16

Rakičan (*fig. 16*)

A narrow ditch with rounded off corners and an entrance in the center; probably the remains of a Roman military encampment.
Cropmark - inclined photo.
Photo: B. Kerman, 9. 6. 1997.

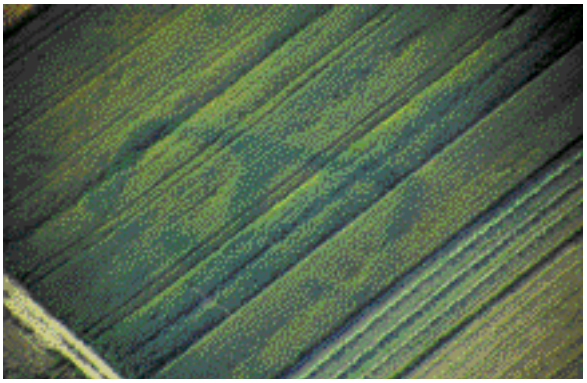

Fig. 17 / sl. 17

Kupšinci (*fig. 17*)

A wide, oblong ditch pertaining to a two-part square building.
Cropmark - inclined photo.
Photo: B. Kerman, 5. 6. 1998.

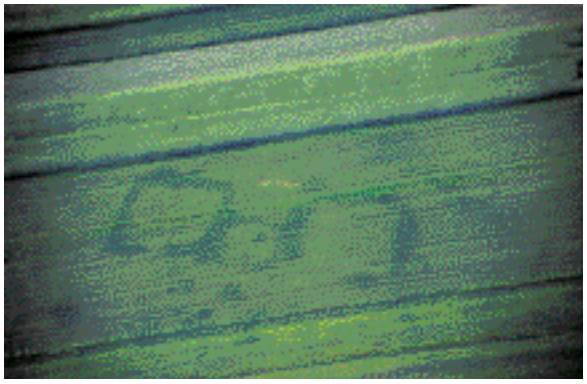

Fig. 18 / sl. 18

Bratonci (*fig. 18*)

Three rectangular ditches pertaining to building structures. The two larger square structures have visible entrances into the spaces, and a pit is dug in the center of the smaller structure. Numerous holes, or rather pits, are dug before the building structure.
Cropmark - inclined photo.
Photo: B. Kerman, 5. 6. 1998.

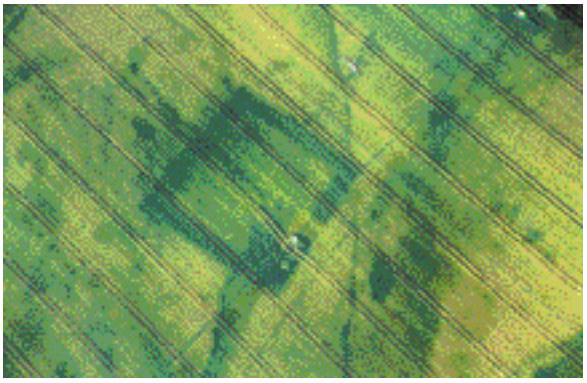

Fig. 19 / sl. 19

Murska Sobota (*fig. 19*)

A rectangular ditch pertaining to a building structure with an entrance - a Roman or medieval fortification.
Cropmark - inclined photo.
Photo: B. Kerman, 9. 6. 1998.

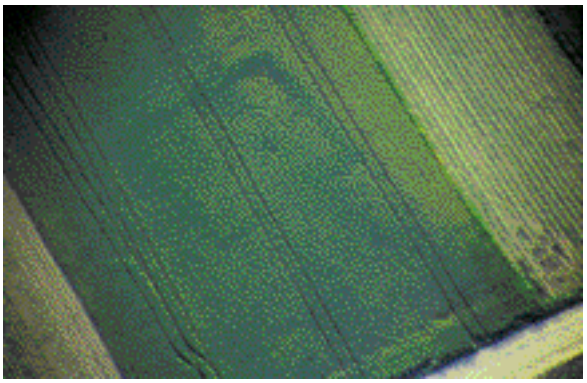

Fig. 20 / sl. 20

Pušča (*fig. 20*)

A wide ditch pertaining to a square fortification with an entrance.
Cropmark - inclined photo.
Photo: B. Kerman, 5. 6. 1998.

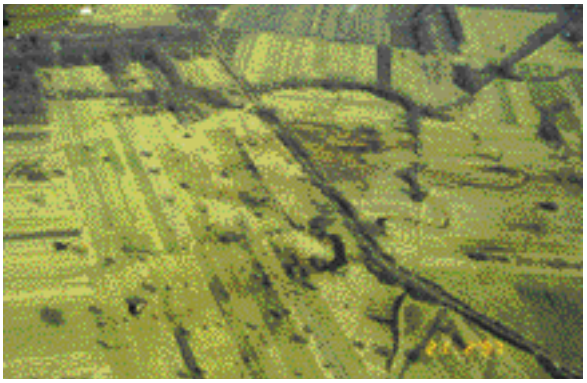

Fig. 21 / sl. 21

Črenšovci (*fig. 21*)

A crossing of a former road.
Cropmark - inclined photo.
Photo: B. Kerman, 22. 2. 1997.

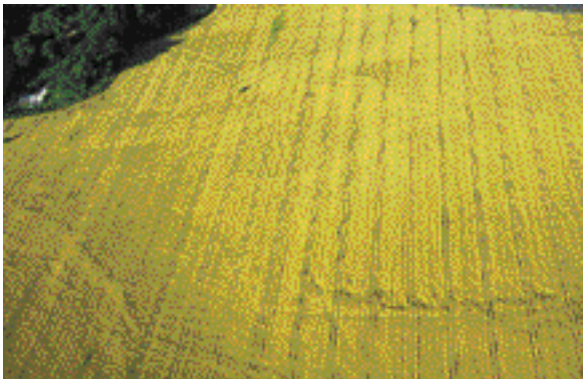

Fig. 22 / sl. 22

Beltinci (*fig. 22*)

A former road that is interrupted by architectural remains.
Cropmark - inclined photo.
Photo: B. Kerman, 3. 7. 1997.

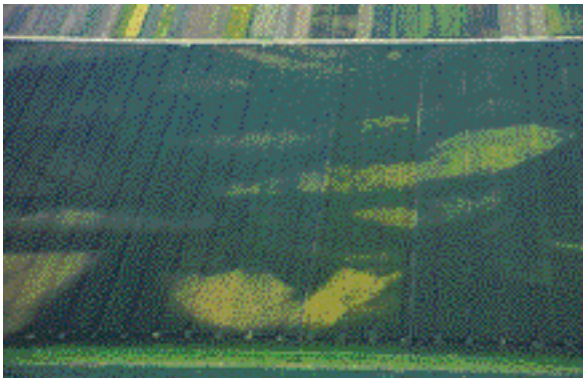

Fig. 23 / sl. 23

Ižakovci (*fig. 23*)

A former road.
Cropmark - inclined photo.
Photo: B. Kerman, 10. 6. 1998.

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Poselitvene strukture v Prekmurju iz zraka

UVOD

Zračni arheološki trening, ki je trajal od 15. do 22. junija 1996 pri Siófoku ob Blatnem jezeru, je bil osnova ter prava šola za razumevanje in razvoj zračne arheologije na Slovenskem (Beweley, Braasch, Palmer 1996, 745-750). Zračna arheologija je v državah zahodne Evrope sprejeta in je enakovredna z ostalimi arheološkimi in raziskovalnimi metodami in predstavlja osnovo za raziskovanje poselitve in zaščito ne le arheo-loških, ampak tudi zgodovinskih in naravnih spomenikov krajine. Njeni začetki segajo v čas pojava prvih balonov. Predvsem pa so na razvoj zračne arheologije močno vplivala prva letala. Prva in druga svetovna vojna sta s fotografiranjem območij, ki so jih zajele vojaške operacije, zapustili dragoceno bazo arheo-loških podatkov in omogočili arheologom, da so z interpretacijo teh posnetkov, ki niso bili samo iz Evrope, ampak tudi iz dežel Bližnjega vzhoda, lahko analizirali arheološke spomenike, ki so izginili ali pa so bili odkriti šele zdaj.

Vsekakor pa gre največ zaslug za razvoj zračne arheologije O. G. S. Crawfordu, ki ga Angleži imenujejo tudi z vzdev-kom "oče zračne arheologije". Njegova knjiga, ki je izšla leta 1920 z naslovom *"Wessex from the Air",* je bila revolucionarno delo znotraj angleške arheologije, saj je lahko arheolog zdaj prvič videl arheološko najdišče v celoti (Bewley 1997, 10-21).

V državah bivšega komunističnega oz. socialističnega družbenega sistema (vzhodnoevropske države), kjer je bil zračni prostor zaprt, se prav tako ni moglo delati v zračnem arhivu. Težaven je bil tudi dostop do zračnih posnetkov, ki so bili vodeni pod strogo zaupno. Tako se zračna arheologija ni mogla uveljaviti.

Zračna arheologija ima danes močno razvite raziskovalne skupine v Angliji, ki sodijo pod okrilje RCHME. Zelo je dejavna neodvisna skupina zračnih arheologov Aerial Archaeological Research Group (AARG), ki združuje člane iz različnih držav; ti izdajajo *AARGnews* (*The Newsletter of the Aerial Arheology Research Group*). Prav tako je tudi v Franciji, Belgiji in Nemčiji več centrov ali skupin za zračno arheologijo. Po zračnem arheološkem treningu pri Siófoku so na Češkem v sestavu arheološkega inštituta ustanovili skupino za zračno arheologijo, ki jo vodi Martin Gojda (Gojda 1997). Prav tako je zelo aktivna skupina zračnih arheologov iz Slovaške (Kuzma 1995, 251-258) in Madžarske, kjer letijo predvsem Francozi (Gougey, Szabo 1995).

Trening, ki sem ga na začetku omenil, je dal ogromno znanja iz zračne arheologije tudi slovenskim arheologom, kar je hkrati pomenilo začetek razvoja te discipline tudi v slovenskem prostoru.

KAJ JE ZRAČNA ARHEOLOGIJA?

Nekatere univerzalne metodološke smernice zračne arheologije v Sloveniji so bile že podane (Grosman 1996, 47-50), tudi zračna arheološka rekognosciranja, postopek dela in objava zračnih fotografij iz Prekmurja ter občutki, ki jih zračni arheo-log doživlja v zraku, so bili že opisani (Kerman 1996, 20; Kerman 1998, 46).

Pojem zračne arheologije največkrat zajema zračno rekognosciranje, fotografiranje, fotointerpretacijo in kartiranje arheoloških struktur.

Zračno arheologijo torej moramo končno definirati kot disciplino, ki se ukvarja s pregledovanjem krajine iz zraka in s pridobivanjem podatkov, ki so koristni za nadaljnje arheološke in zgodovinske študije ter zaščito spomenikov zgodovinske krajine. Zračno arheološko rekognosciranje je zelo učinkovit in relativno hiter in neuničevalen način dokumentiranja arheoloških struktur (ostalin) iz zraka, ki se pojavljajo na posevkih in travnikih kot pozitivna ali negativna refleksija (angl. cropmarks); na zoranih njivah jih zaznavamo na osnovi barvnih razlik orane zemlje (angl. soilmarks).

Svetlobni in senčni dejavniki so zelo pomembni za odkrivanje tistih arheoloških najdišč, ki so na zemeljskem reliefu komajda vidni. Zračni arheologi skušajo pridobiti njihove obrise z ekstremno nizko svetlobo, zato je najboljši čas za posnetke zgodaj zjutraj in pozno popoldne. Enak čas posnetkov velja tudi za zimske mesece. Zelo pomemben dejavnik pri zračnih posnetkih je poraščenost tal, ki je odvisna od vrste rastlin. Najboljše rezultate dobi zračni arheolog na poljih, ki so posejana z žitaricami, in na travnikih. Mnogo slabše se vidijo strukture na poljih, ki so posejana s sladkorno peso in koruzo, saj sta ti dve kulturi posejani v večjih razdaljah glede na žitarice, za katere je značilna gosta strnjena rast.

Poševne posnetke iz letala opravi arheolog sam z običajnimi filmi (črno-beli film in film za diapozitive) in fotoaparatom v roki pri odprtem oknu dvosedežnega ali štirisedežnega letala, ki ga najame na lokalnem športnem letališču. Poševni posnetki so najboljši za registriranje posameznih najdišč ali območij historičnega pomena. Prednost je v tem, da lahko fotograf sam izbere najugodnejši trenutek dneva in vrsto svetlobe, ki je pomemben dejavnik za dobro fotografijo, da se jasno izrišejo na površini posevka še tako slabo vidne arheološke strukture v obliki okroglih, polkrožnih, kvadratnih, ravnih jarkov, ki so lahko grobišča, ograde, naselbine, tabori ali komunikacije.

PREKMURSKA IZKUŠNJA - OBLIKE POSELITVENIH STRUKTUR IZ ZRAKA

Prekmurje geografsko delimo na ravninski predel med reko Muro in Ledavo do prve terciarne terase Goričkega in na gričevnati gorički svet, za katerega so značilni predvsem poseljeni grebeni in ga zaznamujejo gozdovi in doline s potoki (Ilešič 1935, 5-12).

Razdrobljenost agrarnih površin, različnost posajenih kultur na njivah, zelo malo travniških površin, melioriranost polj ter regulacije in izsuševanje starih strug potokov otežujejo vidljivost in prepoznavnost arheoloških struktur na zemeljskem površju (*sl. 1*). Za zračno rekognosciranje je prav gotovo najbolj ugoden ravninski del Prekmurja med Muro in Ledavo. Težko je raziskovati arheološke strukture iz zraka na Goričkem, kjer je teren zelo razgiban z veliko gozda in je poselitev možna le ob strugah večjih potokov, kot je npr. predel med Malo Krko in Veliko Krko.

Arheološko zračno rekognosciranje Prekmurja se sistematično opravlja od leta 1997. Do zdaj je bilo odkritih 90 arheo-loških najdišč, s tem da je bilo opravljenih vsega 60 ur letenja. Vendar je to premalo ur, da bi lahko ob vsakem letnem času sistematično pregledovali pokrajino, predvsem pa to ni mogoče pozimi, ko se dobijo zelo dobri rezultati.

Prednost je v tem, da je blizu mesta Murska Sobota letališče in da je ob vsakem času in vremenu možno naročiti polet, kar omogoča, da lahko ob vsaki spremembi vremena in lege sonca preletimo zaželeni del pokrajine. Na žalost v Sloveniji ne obstaja pri nobeni pomembni arheološki inšituciji (FF - Oddelek za arheologijo, Inštitut za arheologijo ZRC SAZU, Zavodi za varstvo naravne in kulturne dediščine) oddelek ali skupina za zračno arheologijo, ki bi naročala in hkrati vodila register najdišč, dokumentiranih iz zraka, ki bi to delala sistematično za vse pokrajine in hkrati zagotovljala potrebna finančna sredstva za rekognosciranje iz zraka. Zračna arheologija mora postati perspektiva slovenske arheologije. Trenutno vodi register za arheološka najdišča Prekmurja iz zraka Pokrajinski muzej Murska Sobota, za ostale pokrajine v Sloveniji pa podatki niso znani.

Prekmurje je ena redkih pokrajin v Sloveniji, ki ima narejeno arheološko topografijo, kar je zelo dobra osnova za nadaljnje arheološko raziskovanje pokrajine (Šavel 1991). Pri zračnem arheološkem rekognosciranju se nismo ozirali na že znana najdišča, ker bi nas lahko to zavedlo, ampak smo obravnavali pokrajino kot celoto, ki jo ponovno odkrivamo.

Sistematično se rekognoscira področje celotnega Prekmur-ja v vseh letnih časih. Najkvalitetnejši arheološki podatki in rezultati so znani predvsem na predelu med reko Muro in Ledavo. Največja koncentracija arheoloških najdišč pa se je pokazala ob potoku Doblu, ki teče v bližini Murske Sobote.

Odkrita arheološka najdišča iz zraka bom opredelil tipološko glede na obliko struktur, ki se kažejo na zemeljskem reliefu kot vegetacijski znaki (krogi, polkrogi, kvadrati in pravokotniki, ravni jarki ali manjši krogi). Prav tako je zelo težavno časovno opredeljevanje, ker nobeno najdišče do zdaj ni bilo pregledano s terenskimi pregledi in tudi ni bilo izkopavano. Interpretacija najdišč je bila možna le preko literature na podlagi podobnih posnetkov arheoloških struktur, ki so bili tudi izkopavani. Za lažjo interpretacijo fotografij so bile arheološke strukture iz nje ročno prerisane.

Najpogostejši arheološki vegetacijski znaki so manjši krogi, ki merijo v premeru od 20 do 25 m. Širina jarka je pri bujni vegetaciji do 2 m (*sl. 2*). Večji krogi merijo v premeru od 35 do 40 m. Širina jarka pri bujni vegetaciji je do 1 m in polkrožni jarki (*sl. 4; 6; 7;*). Polkrožni jarki (prstanasti jarki) merijo v premeru 20 m. Širina jarka je pri bujni vegetaciji do 2 m (*sl. 2; 9-12*)

Zelo pogosti so vegetacijski znaki v obliki kvadrata oz. pravokotnika. Poznamo tip manjšega kvadrata velikosti od 12 do 15 m, širina jarka pri bujni vegetaciji je do 2 m (*sl. 9; 10*), tip kvadrata velikosti do 30 m in debelino jarka pri bujni vegetaciji do 3 m (*sl. 8; 13*) ter tip velikega kvadrata z odprtino (vhodom) velikosti od 60 do 70 m in debelino jarka pri bujni vegetaciji do 8 m (*sl. 19; 20*). Znan je tudi tip vegetacijskega znaka, ki ga sestavljata dva enaka stranska kvadrata, s premerom 40 m in debelino jarka ob bujni vegetaciji od 3 do 4 m, in manjšega kvadrata, velikosti do 25 m in debelino jarka ob bujni vegetaciji do 4 m (*sl. 18*).

Pojavljajo se tudi vegetacijski znaki v obliki pravokotnika kot pozitivni vegetacijski znak velikosti 90 x 30 m in debelino jarka ob bujni vegetaciji do 4 m (*sl. 17*) in pravokotnik kot negativni vegetacijski znak (*sl. 14*).

Poznamo tudi dolge, ozke jarke širine do 1 m (*sl. 16*) in širše jarke širine do 2 m z zaobljenimi vogali (*sl. 15*).

Za lažje kronološko opredeljevanje arheoloških najdišč iz zraka je potrebno upoštevati dosedanje stanje raziskanosti pokrajine.

Prazgodovina

Najstarejša poselitev pokrajine ob Muri sega v čas mlajše kamene dobe in v bakreno dobo. Naselbine lasinjske kulture

so odkrite v Bukovnici, Filovcih, Dobrovniku, Kobilju, Mlajtincih, Gomilicah, Puconcih, Korovcih, Lendavi, Brezovici. Razprostranjenost najdišč kaže, da je bila poselitev skoncentrirana na nižinski del Prekmurja, predvsem ob spodnjem delu potoka Ledave in njenih pritokov. Od navedenih naselbin je bila sistematično raziskovana Bukovnica. Naselbina naj bi prostor horizontalno širila. Ugotovljena pa je bila gradnja nadzemnih pravokotnih lesenih, z ilovico ometanih hiš; na prostem so bile peči in večje jame (Šavel 1991, 13; Šavel 1994, 39-50).

Slika poselitve se spremeni v bronasti dobi; naselbine nastajajo v novih okoljih. V čas srednje bronaste dobe sodijo naslednje znane naselbine: Oloris pri Dolnjem Lakošu, Gaborkert pri Lendavi, Gosposko pri Hotizi in Prapornica pri Gančanih. Večletna sistematična arheološka izkopavanja naselbine Oloris pri Dolnjem Lakošu so dala dobre rezultate o arhitekturnih ostalinah. Odkritih je bilo več stavb (hiš) velikosti 10 x 6 m, ki so bile zgrajene iz vertikalnih lesenih kolov, prepletenih z vejevjem, ometanim z ilovico. Naselbina naj bi bila naravno omejena z 2 m širokim jarkom (Šavel 1991, 15-16; Šavel 1994, 56-57).

Zelo redke so naselbine iz železne dobe. Nekaj poznolatenske grafitne keramike je bilo odkrite na bronastodobni naselbi-ni Oloris pri Dolnjem Lakošu. Med potencialne železnodobne naselbine sodi blago dvignjen predel Duge njive pri Trnju (velikosti 300 x 300 m, zapirajo ga močvirnati jarki, le z vzhodne strani je možen dohod) in dvignjen plato v središču Černelavec, kjer je bila pri sondiranju odkrita grafitna keramika (Šavel 1991, 16-17).

Iz dosedanjih raziskovanj prazgodovinskih naselbin je razvidno, da jih je bila večina ob strugah potokov ali na zamočvirjenih predelih, katere obdajajo naravni jarki, te pa predstavljajo znotraj poplavnega področja neke vrste otok. Prav tako prevladujejo v glavnem pravokotne stavbe (hiše), ki so zgrajene iz lesenih stojk in so vkopane v zemljo. Do sedaj niso bili odkriti nobeni obredni ali ceremonilani objekti niti grobišča.

Arheološka najdišča iz zraka nam dajejo drugačno sliko prazgodovinske poselitve.

Skupino okroglih jarkov ob magistralni cesti Murska Sobota-Bakovci (*sl. 2*) lahko opredelimo kot prazgodovinske gomile. Gre za skupino štirih okroglih jarkov, od katerih sta dva med seboj povezana s prehodom iz enega kroga v drugi krog, vidnim vkopom v sredini in stranskim dohodom. Jarek je na levi nezaključen in ima prstanasto polkrožno obliko. Četrti krožni jarek je na desni strani, ima prav tako poseben dohod in viden vkop v sredini. Ob strani krožnih jarkov so vidni pravokotni vkopi in jame.

Prav tako bi lahko opredelili okrogli jarek z manjšim krogcem v sredini, ki je bil odkrit jugozahodno od Petišovec, kot grobišče z jarkom (*sl. 3*).

Med obredne prostore lahko uvrstimo arheološko najdišče, ki leži severno od vasi Kupšinci, z značilnim okroglim jarkom. Znotraj njega pa so simetrično krožno razporejeni manjši krogci, ki so ostanek vkopanih stojk (*sl. 5*).

Zelo pogoste so prazgodovinske naselbine, ki jih obdajajo večji okrogli jarki velikosti od 35 do 40 m. Ena od njih je bila odkrita na poljih jugozahodno od Murske Sobote in leži ob nekdanji strugi potoka. Pripadal ji je tudi manjši okrogli jarek spodaj. Med krogoma poteka cikcak linija, ostanek strelskih jarkov iz prve ali druge svetovna vojne (*sl. 4*). Podobna naselbina, ki jo prav tako obdaja okrogli jarek in je dodatno zaščitena z jarkom zgoraj in spodaj, je bila odkrita južno od Murske Sobote (*sl. 6*). Drugačna pa je naselbina v Mostju (*sl. 7*), ki jo je obdajal okrogli nasip z dvema vhodoma iz vzhodne in južne strani. V sredini naselbine je vidnih več okroglih vkopov.

Poseben tip prazgodovinskih naselbin sestavljajo kvadratni jarki skupaj z manjšimi polkrožnimi prstanastimi jarki. Te naselbine so znane pri potoku Doblu v Krogu (*sl. 8*) zahodno od Bratonec (*sl. 9*) in pri Beltincih (*sl. 10*).

Antično obdobje

Antično obdobje v Prekmurju zaznamujejo gomilna grobišča; do zdaj jih je evidentiranih 77. Gomile se pojavljajo posamezno ali v skupinah. Manjše merijo v premeru do 6 m, večje pa tudi do 25 m. Ugotovljenih je tudi deset antičnih naselbin. Delno je bila arheološko raziskana naselbina v Dolgi vasi. Manjša izkopavanja so bila tudi na Ižišču pri Ivancih. Prav tako je bila locirana trasa rimske ceste, ki je prečkala Prekmurje v smeri od Kota do Dolge vasi in je naprej vodila proti Zalalovoju, Sopronu in Szombathelyu (Šavel 1991, 17-21; Pahič 1972, 11-20).

Med arheološkimi najdišči, ki so bila odkrita iz zraka in ki bi lahko sodila v antično obdobje, prevladujejo skupine okroglih jarkov, od katerih so nekateri prstnaste nesklenjene polkrožne oblike. Dve taki večji skupini okroglih jarkov sta bili odkriti južno od Murske Sobote (*sl. 11; 12*) in tudi severno od Kroga (*sl. 13*). Za skupino krožnih jarkov pri Murski Soboti bi lahko domnevali, da gre za dva večja kompleksa antičnega gomilnega grobišča. Enako bi lahko trdili tudi za skupino okroglih jarkov severno od Kroga, kjer se pojavljata dva kvadratna jarka stavbe, kar kaže morda na večfaznost najdišča.

Nekaj več o načinu urbanizacije življenja Rimljanov na podeželju nam lahko pove odkrita rimska vila južno od Murske Sobote (*sl. 14*), ki leži ob izsušeni strugi potoka. Sestavlja jo podolgovata stavba, njej nasproti je stavba z več vmesnimi prostori in manjšim dodatnim prostorom na desni strani.

Čeprav je imelo Prekmurje v rimskem obdobju kot pokrajina prehodni značaj, jo je bilo potrebno, kot vse ostale dežele, ki so sestavljale rimski imperij, tudi osvojiti in hkrati obraniti imperij. Iz zraka odkrita jarka z zaobljenim vogalom v Lemerju (*sl. 15*) in pri Rakičanu (*sl. 16*), sta najverjetneje ostanka rimske vojaške utrdbe.

Iz zraka je bilo odkrito večje število arhitekturnih ostalin, katere je težko časovno natančno opredeliti ali sodijo v rimsko obdobje ali pa v srednjeveško. Na poljih južno od Kupšinec je znan jarek velike dvodelne podolgovate pravokotne stavbe (*sl. 17*). V rimsko obdobje bi lahko opredelili dva večja kvadratna jarka in manjši kvadratni jarek stavbe, rezidence ali utrdbe, severozahodno od Bratonec (*sl. 18*). Širok pravokotni jarek stavbe z vhodom, ki je bil odkrit južno od Murske Sobote, bi lahko bil ostanek rimske ali srednjeveške utrdbe (*sl. 19*). Podobno bi lahko interpretirali jarek kvadratne stavbe severno od Pušče (*sl. 20*).

Prekmurje je imelo v preteklosti tudi bogato cestno povezavo (Horvat-Šavel 1985, 163-175; Zelko 1962, 23, 24, 27). Ostanki nekdanjih cest so bili iz zraka odkriti jugovzhodno od Črenšovec (*sl. 21*), pri Beltincih (*sl. 22*) in pri Ižakovcih (*sl. 23*).

Pregled zračnih arheoloških posnetkov iz Prekmurja nam torej zagotavlja drugačen pogled na arheološko podobo pokrajine. Kljub temu da so zračni arheološki posnetki za koga morda premalo prepričljivi in interpretacije težko dokazljive, sem prepričan, da ta metoda daje izjemne možnosti v razumevanju krajinske arheologije.

KATALOG ZRAČNIH FOTOGRAFIJ Z INTERPRETACIJO

Prekmurje (*sl. 1*)

Nižinski predel Prekmurja z razdrobljeno poljsko razdelitvijo in različnimi posevki na njivah, kar otežuje zračno arheološko rekognosciranje.

Foto: B. Kerman, 24. 3. 1998.

Murska Sobota (*sl. 2*)

Skupina okroglih jarkov prazgodovinskih gomil, od katerih sta dva med seboj povezana s prehodom iz enega kroga v drugi krog z vkopom v sredini in stranskim dohodom. Jarek na levi ni zaključen in ima prstanasto polkrožno obliko. Četrti krožni jarek je na desni strani in ima prav tako viden vkop v sredini kroga. Ob strani krožnih jarkov so vidni pravokotni vkopi in jame. Krogi oz. gomile so na dvignjenem predelu (otoku), okrog so vidne nekdanje struge potokov. Najdišče je že prizadela gradnja in širitev
magistralne ceste Murska Sobota-Bakovci.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 9. 6. 1998.

Petišovci (*sl. 3*)

Večji krožni jarek, znotraj katerega je v sredini dobro viden manjši okrogli vkop. Najdišče leži ob strugi potoka in je najverjetneje ostanek prazgodovinskega grobišča, s centralnim grobom v sredini, ki ga obdaja krožni jarek,
Vegetacijski znak - poševni posnetek
Foto: B. Kerman, 24. 6. 1997.

Murska Sobota (*sl. 4*)

Na desni strani večji okrogli jarek prazgodovinske naselbine, na levi manjši okrogli jarek. Med njima poteka poljski jarek, s cik-cak linijo, ki je ostanek strelskih jarkov iz 1. ali 2. svetovne vojne.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 9. 6. 1998.

Kupšinci (*sl. 5*)

Večji okrogel jarek, znotraj njega je viden še en obris kroga, ki ga sestavljajo simetrično v razdaljah razporejeni manjši krogci (vkopi). Na levi strani sta še vidna dva manjša okrogla jarka, prav tako je na desni strani okrogel jarek. Najdišče bi lahko opredelili kot grobiščni ali ritualni kompleks.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 6. 2. 1996.

Murska Sobota (*sl. 6*)

Večji okrogli jarek prazgodovinske naselbine, ki ga z zgornje in spodnje strani obdajata jarka. Nad okroglim jarkom naselbine so horizontalni jarki.
Vegetacijski znak - pozitivni posnetek pri ekstremno nizki sončni svetlobi.
Foto: B. Kerman, 3. 7. 1997.

Mostje (*sl. 7*)

Okrogli jarek ali nasip prazgodovinske naselbine v dvema vhodoma iz vzhodne in južne strani. Znotraj okroglega prostora je več manjših okroglih vkopov, ki tvorijo znotraj kroga elipso.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 10. 6. 1998.

Krog (*sl. 8*)

Na spodnji strani dva pravokotna ograjena prostora (jarka), zgoraj trije okrogli jarki,
ki bi lahko bili prazgodovinske gomile, ali pa ograde.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 3. 7. 1997.

Bratonci (*sl. 9*)

Zgoraj ostanki jarkov pravokotne stavbe, v sredini polkrožni prstansti jarek gomile ali ograde z več vkopi pred vhodom. Zraven polkrožen jarek gomile ali ograde.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 3. 7. 1997.

Beltinci (*sl. 10*)

Jarek pravokotne stavbe z vhodom, ki ji najverjetneje pripada polkrožni prstanasti jarek ter podolgovata široka jarka na desni strani.
Vegetacijski znak - poševni posnetek
Foto: B. Kerman, 3. 7. 1997.

Murska Sobota (*sl. 11*)

Skupina okroglih in polkrožnih prstanastih jarkov - ostanek gomilnega grobišča.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 9. 6. 1998.

Murska Sobota (*sl. 12*)

Dve skupini okroglih in polkrožnih prstanastih jarkov, kot ostanek gomilnega grobišča.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 5. 6. 1998.

Krog (*sl. 13*)

Skupina okroglih in ovalnih jarkov, najverjetneje gomilno grobišče, ki ga na zgornjem in spodnjem delu zaključujeta dve pravokotni stavbi z vhodom.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 9. 6. 1998.

Murska Sobota (*sl. 14*)

Negativni odtis zidovja rimske vile, sestavljene iz podolgovate stavbe, nasproti njej je stavba z več vmesnimi prostori in majhnim prostorom na desni. Rimska vila leži ob izsušeni strugi potoka.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 7. 7. 1998.

Lemerje (*sl. 15*)

Širok jarek z zaobljenim vogalom, najverjetneje ostanek rimskega tabora.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 9. 5. 1998.

Rakičan (*sl. 16*)

Ozek jarek z zaobljenim vogalom in vhodom v sredini, najverjetneje ostanke rimskega tabora.

Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 9. 6. 1997.

Kupšinci (*sl. 17*)

Širok jarek podolgovate dvodelne kvadratne stavbe.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 5. 6. 1998.

Bratonci (*sl. 18*)

Trije pravokotni jarki stavbe. Večji kvadratni stavbi imata viden vhod v prostor, manjši pa ima jamo v sredini. Pred stavbo je več vkopov oz. jam.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 5. 6. 1998.

Murska Sobota (*sl. 19*)

Pravokotni jarek stavbe z vhodom - rimska ali srednjeveška utrdba.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 9. 6. 1998.

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Pušča (*sl. 20*)

Širok jarek kvadratne utrdbe z vhodom.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 5. 6. 1998.

Črenšovci (*sl. 21*)

Križišče nekdanjih cest.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 22. 2. 1997.

Beltinci (*sl. 22*)

Nekdanja cesta, ki jo prekinejo arhitekturne ostaline.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 3. 7. 1997.

Ižakovci (*sl. 23*)

Nekdanja cesta.
Vegetacijski znak - poševni posnetek.
Foto: B. Kerman, 10. 6. 1998.