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METHODS OF SURFACE ARCHAEOLOGICAL RESEARCH AND THEIR APPLICATION IN BUJŠTINA, ISTRIA

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Contents

Zahvale

Ovaj rad je nastao nakon tri sezone terenskog rada na prostoru sjeverozapadne Istre i studija arheološke metodologije na Sveučilištu u Ljubljani.

U pripremi magistarskog rada najviše mi je pomogao menotor, prof. Predrag Novaković, koji je sa strpljenjem pratio napredak teksta od nesigurnih začetaka. Terenski rad sam organizirao kao zaposlenik Muzeja grada Umaga te se zahvaljujem kolegama iz muzeja na podršci i razumjevanju za jedan razmjerno neuobičajen način arheološkog istraživanja. Zahvala i Gradu Umagu, prije svega pročelniku za kulturu Dimitriju Sušnju, na prepoznavanju važnosti topografskog istraživanja te na omogućavanju korištenja prostornih podataka bez kojih bi ovaj rad zasigurno izgubio na kvaliteti.

Nekoliko vrlo vrijednih sugestija u vezi arheološke topografije Istre te nalaza koje smo otkrili prilikom terenskog istraživanja pružili si mi kolege iz Arheološkog muzeja Istre, naročito Kristina Mihovilić, te Darko Komšo i Tatjana Bradara. Za vrijeme istraživanja posjetili su nas i arheolozi prof. Klara Buršić-Matijašić i Damir Matošević iz Zavičajnog muzeja Grada Rovinja koji su također pomogli u tumačenju nekih nalaza. U svakom slučaju, sve pogreške koje sam učinio prilikom obrade i tumačenja pronađenih nalaza su u potpunosti moje.

Više arheologa i studenata arheologije je sudjelovalo u terenskom istraživanju. Tea Katunarić je preuzela vodstvo terenskog pregleda za mojeg odsustva u ožujku 2007., te je također znatno doprinjela kvaliteti rada svojim poznavanjem topografskih istraživanja u Dalmaciji. Prilikom organizacije sljedeće kampanje, 2008. godine, pojavili su se neugodni problemi administrativne naravi te je nominalno vodstvo projekta nesebično preuzeo Boris Magdić. Opet naglašavam da je svaka pogreška koja je nastala za vrijeme rada te prilikom tumačenja nalaza samo moja. Ostatak terenske ekipe su činili: Biljana Bojić, Ana Franjić, Kristina Gergeta, Tena Karavidović, Andreja Kudelić, Ana Marić, Filomena Sirovica, Lucijana Šešelj i Marina Zgrablić. Ovaj rad je u najvećoj mjeri utemenjen na njihovoj predanosti.

Vrijedan doprinos istraživanju su također pružili Rafko Urankar i Jure Krajšek koji su izvršili zračno snimanje nalazišta Sipar, Tiola i Zambratija. Rafko je također pregledo neke (lažne) tragove metalurške aktivnosti. Tvrtka Geoarheo d.o.o. je izvršila georadarsko snimanje na više lokaliteta koji su otkriveni prilikom terenskog pregleda. Prof. Branko Mušič mi kasnije pomogao u tumačenju rezultata geofizičkog snimanja.

Keramičke nalaze je nacrtala Lara Cernički, a Stašo Forenbaher mi je pomogao svojim poznavanjem istarske prapovijesne lončarije.

Vrlo vrijednu pomoć dobio sam od Saše Poglajena koji je 2007. godine obranio doktorat s temom prostorne analize arheoloških lokaliteta sjeverozapadne Istre. Zahvaljujem ne samo na podacima koji su se pokazali vrlo važnima prilikom izrade ovog rada, već i na kreativnoj diskusiji. Sašo je također preveo sažetak rada na slovenski jezik.

Korekcije teksta na engleskom jeziku je napravio Vladimir Brljak, što je s obzirom na duljinu rada bio pozamašan zadatak.

Naročito bih želio zahvaliti poljoprivrednicima i ostalim zemljovlasnicima zapadne Bujštine koji su pokazali iznimno razumijevanje za arheološko istraživanje, čak i kada je naše postupanje moglo nanijeti određenu štetu usjevima. Nije riječ o formalnoj zahvali; vrijedi naglasiti da se niti jednom nismo susreli s problemima oko pristupa obrađenom zemljištu, što je zaista rijetkost.

I konačno, mukotrpno stvaranje ovoga teksta kao i sve nedaće i nedoumice koje su se nanizale još od početaka organizacije terenskog rada u Umagu 2006. godine strpljivo je podnosila moja Élise, koja je i sama nedavno dovršila doktorsku disertaciju. Mnogo smo stranica progurali zajedno!

Magistarski rad posvećujem svojoj majci, iako bih volio da mogu i nešto više od toga. Zasigurno bi je obradovao moj akademski uspjeh da je još uvijek među nama.

Povzetek

Delo je nastalo na podlagi sistematičnega terenskega pregleda na območju zahodne Bujštine v Istri. Težišče je postavljeno na oceni možnosti in omejitev uporabljene metodologije v proučevanju arheološke krajine. Predstavljene so tri osnovne teme: teoretična izhodišča krajinske arheologije (Pogl. 2 - 4), metodologija terenskega pregleda (Pogl. 5) in interpretacija rezultatov, kateri je posvečen večji del naloge (Pogl. 6 - 11). Glede na raznolikost tem se razprava nanaša na več različnih prostorskih in konceptualnih kontekstov, predvsem na prostor raziskav v zvezi z metodološkimi problemi in na prostor Bujštine pri interpretaciji arheoloških ostankov. Občasno so omenjeni tudi širši problemi kot je metodologija terenskaga pregleda v Sredozemlju ali posamezne teme, ki se nanašajo na arheologijo Istre.

Potrebno je poudariti, da krajinska arheologija (*sensu* Novaković 2008) ni koherentna, jasno definirana disciplina kot npr. arheologija paleookolja ali zooarheologija, temveč predvsem nek pristop pri proučevanju arheološkega zapisa (angl. *archaeological record*), ki se nanaša na širši geografski kontekst. Nekateri arheologi to razumejo kot način razumevanja krajine in ne kot edinstven pristop (angl. *"thinking about the landscape"*; Johnson 2005). Dodaten problem predstavlja primerjava arheologije krajine in arheologije prostora v okviru diskusije o procesualnem in postprocesualnem pristopu k arheologiji (Tartaron 2003, 31; Novaković 2008). Te razlike je potrebno razumeti v širšem kontekstu polemik znotraj arheološke teorije, saj bi posplošene preslikave teoretskih izhodišč na metodologijo terenskega pregleda verjetno privedle do znatnega zožanja interpretacijskega spektra posameznih raziskav (ibid). Pristop, za katerega smo se odločili pri tem delu, temelji na sistematičnem terenskem pregledu kot temeljni metodologiji, s čimer je poudarjen kvantitativni, prostorski vidik odkritih arheoloških ostankov.

Eden od vzrokov za vključitev v zahtevno polemiko o metodologiji in uporabi sistematičnega terenskega pregleda v tem delu je tudi zelo neobičajna situacija na Hrvaškem. Kljub temu, da imamo kar nekaj zelo uspešnih projektov, ki so jih v 80-tih letih prejšnjega stoletja organizirale ekipe hrvaških in tujih arheologov, sta terenski pregled kot metoda in krajinska arheologija kot koncept doživela slab odziv. Dovolj je če omenimo raziskave na Hvaru kot del širšega projekta v srednjejadranskem arhipelagu (Bintliff, Gaffney in Slapšak 1989; Kirigin 1998) in sistematičen pregled v zadarskem zaledju imenovan Neotermalna Dalmacija (Chapman, Shiel in Batović 1996). V zadnjem času so projekti, ki vsaj deloma temeljijo na metodologiji sistematičnega terenskega pregleda, organizirani okoli Čepićkega polja v Istri (Komšo, Balbo in Miracle 2007), Gradu pri Nakovani na Pelješcu (Forenbaher in Rajić-Šikanić 2006) ter na Lastovu (Bass et al. 2009).

Eden od možnih vzrokov za nastalo stanje je izrazita teoretična in metodološka usmerjenost večine projektov, še posebej tistih iz 80-tih let, medtem ko so vprašanja aktualna za lokalno arheologijo bodisi postavljena v drugi plan bodisi popolnoma zanemarjena. Gre za vprašanja kot so tipologija materiala in najdišč ali določena specifična vprašanja kulturnega razvoja. Način izdelave arheološke dokumentacije, ki je vedno odraz uporabljene metodologije, je prav tako lahko problematičen glede na zahteve lokalne arheologije in načina upravljanja s kulturno dediščino. Kakor koli študija, ki je v prvi vrsti usmerjena v lokalno arheološko problematiko z uporabo sodobne metodologije sistematičnega terenskega pregleda, bi lahko bila dobra spodbuda za nadaljnji razvoj krajinske arheologije na Hrvaškem. S tem razlogom je v tem delu posebna pozornost namenjena vprašanjem, ki so že dalj časa aktualna v hrvaški arheologiji in ki niso bila zadovoljivo rešena s tradicionalno topografijo. To so vprašanja o nižinski poselitvi v prazgodovinskih obdobjih ali velikost zemljiških posesti v času antike. Potrebno je omeniti, da sta bila izvedena samo dva pionirska sistematična terenska pregleda v okolici Umaga, tako da so pridobljeni podatki še zelo fragmentarni in v mnogočem nezadovoljivi za razrešitev določenih problemov istrske arheologije. Glavni prispevek tega dela je v tem, da uspešno dokaže, da je sistematični terenski pregled metodologija, ki jo je mogoče vključiti v že razvite pristope in proučevanja lokalne arheologije.

Sistematični terenski pregled na območju Umaga je še v razvojni fazi, tako da je bilo v dveh sezonah (2007 in 2008) pregledano relativno majhno območje (1600 ha), vendar zbrani podatki omogočajo relativno dobro podlago za pregled prednosti in pomanjkljivosti uporabljene metodologije. Poudariti moramo, da je bil terenski pregled organiziran kot muzejski projekt, brez pomembnega sodelovanja z znanstvenimi ustanovami, kar je omogočilo bolj prilagodljivo metodologijo in svobodnejši plan raziskav. Vsekakor je takšna organiziranost predstavljala pomanjkljivost, kar se je izkazalo pri pomanjkljivi analizi ostankov. Uporabljena metoda raziskav predstavlja kombinacijo tradicionalnega topografskega in modernega sistematičnega terenskega pregleda.

Po splošnem pregledu teoretskega ozadja krajinske arheologije (Pogl. 2 - 4), posebej metodologije sistematičnega terenskega pregleda (Pogl. 5), je pozornost usmerjena na terenski pregled v okolici Umaga in na proučevanje dobljenih rezultatov v kontekstu krajinske arheologije Bujštine. Kljub temu, da niso bile izvedene namenske raziskave, bo podan opis paleookolja Bujštine v kontekstu vprašanj o preteklem odnosu človeka na okolje. Posebna pozornost je namenjena t. im. procesom formiranja površinskega arheološkega zapisa in krajine kot celote (poljedelstvo, parcelacija, sprememba morske gladine itd.).

Uspešnost uporabljene metodologije raziskav je ocenjena na osnovi kvantitativnih podatkov o gostoti ugotovljenih najdišč s pogledom na preostale parametre, ki jih ni mogoče kvantificirati in ki prav tako vplivajo na končni rezultat raziskav (npr. koledarska sezona raziskav in podobno). Na osnovi teh

parametrov je podana napredna korelacija med intenziteto terenskega pregleda in različnega uspeha pri odkrivanju najdišč glede na njihovo datacijo. Prav tako se dotikamo pomembnega problema izostanka arheoloških najdb iz nekaterih obdobij, še posebej iz srednjega veka, v luči uporabljene metodologije.

Večino najdenega gradiva lahko razvrstimo v tri obdobja: mlajša prazgodovina (bronasta in železna doba), antika (1. - 6. stol.) in novi vek (16. - 19. stol.), katerega gradivo ni bilo analizirano. Najdišča iz prazgodovinskega obdobja so obdelana z analizo različnih tipov najdišč, ki so bila raziskana z različnimi terenskimi metodami (intenzivni sistematični pregled, ekstenzivni pregled, intenzivni strukturni pregled itd.). Posebna pozornost je namenjena utrjenim naselbinam (kaštelirji), ki so dokumentirana z bolj ali manj natančnimi topografskimi posnetki. Med preostalimi najdišči so zastopane gomile, najdišča v vrtačah in plana najdišča. Zaradi problematičnosti datiranja najdišč, ki izvira iz skromnih površinskih najdb, skušamo definirati osnovne fakture prazgodovinske keramike in na ta način vzpostaviti grob kronološki okvir, s katerim je mogoče izpeljati nadaljnja opazovanja. Analiza vidljivosti (angl.: *visibility analysis*) je preizkušena na nekaj najdiščih, ki ležijo na značilnih topografskih lokacijah. V zaključku skušamo sintetizirati dobljene rezultate v kontekstu prazgodovinske arheologije Istre ter predlagati model prostorske organizacije bronastodobne kulturne krajine. Glede na velik delež najdb dokumentiranih na prostem (izven gradišč), daje predlagani model poudarek na razpršen sistem naselitve v času zgodnje in srednje bronaste dobe. Razprostranjenost najdišč na širšem prostoru nakazuje na vodilno vlogo gradišč v tem sistemu, kar ne pomeni nujno osrednje vloge v smislu hierarhične organizacije. Kronološki razvoj tega obrazca je slabo viden v najdbah pridobljenih s terenskim pregledom, vendar se zdi v širšem kontekstu Istre v času mlajše prazgodovine povsem verjetno, da se je sistem naseljevanja do železne dobe razvil v hierarhični model, v katerem gradišča prevzemajo vlogo redistribucije dobrin. To je še posebej dobro vidno v količini importiranega materiala iz naselja Sv. Petar, ki tudi tukaj analiziran.

Najdbe iz rimskega obdobja se v mnogočem razlikujejo od prazgodovinskih in omogočajo uporabo povsem različnih analitičnih metod. Najdišča dokumentirana s sistematičnim terenskim pregledom se nahajajo predvsem na obdelanih površinah in so sestavljena izključno iz površinskih koncentracij artefaktov. Formalne razlike med najdišči so s tem slabo izražene, zaradi homogenosti raziskanega terena (pas značilne rdeče ornice v obalnem pasu), ta situacija verjetno do neke mere odraža izenačenost izvorne antične ruralne krajine. Začenši s to predpostavko smo uporabili več osnovnih metod prostorskih analiz kot so kartiranje grupacij najdišč in Voronijev diagram. Na podlagi teh analiz je predlagan hierarhičen model, v katerem imajo osrednjo vlogo ruralni agrarni kompleksi, verjetno vile rustike, obkroženi z manjšimi pomožnimi enotami. Distribucija najdišč je podana v luči predpostavljene lokalne komunikacijske mreže. Na kratko bo obravnavan problem povprečne velikosti rimskega agrarnega

posestva (*fundus*), brez namena njegove razrešitve, predvsem glede na teoretične in metodološke prednosti in pomanjkljivosti pristopa, ki temelji na sistematičnem terenskem pregledu.

Enajsto poglavje je posvečeno intenzivnemu strukturnemu pregledu pomembnega poznoantičnega najdišča Sipar. Gre za projekt izveden vzporedno s sistematičnim terenskim pregledom in predstavlja primer nedestruktivnih raziskav pomembnega urbanega najdišča.

Znotraj tega sumarno predstavljenega okvira je razdelanih ali vsaj načetih večje število zelo nezdružljivih tem. Gre za eklekticizem, ki je posledica teme in metode raziskav. Krajinska arheologija je zelo zapleteno znanstveno področje, ki v svojem bistvu združuje geologijo, pedologijo, ruralno zgodovino in arheologijo. Že samo dejstvo, da smo se odločili za obdelavo le dveh od več različnih zgodovinskih obdobij, ki so dokumentirana s terenskim pregledom, kaže na zapletenost problematike, s katero se sooča raziskovalec, da ne omenjamo vprašanja kot so evolucija lokalne pedološke podlage, razvoj parcelacije ali nikakor nepomembnega problema globine oranja in ostalih značilnosti lokalne poljedelske prakse. Zaradi teh razlogov na temelju dosedanjih raziskav ni možno narediti celovitega modela razvoja zgodovine krajine zahodne Bujštine, takšne naloge tudi ne more obvladovati zgolj en raziskovalec. Na tem mestu želimo predvsem ponuditi temeljito oceno metodologije sistematičnega terenskega pregleda tako v kontekstu sredozemske arheologije kot tudi v lokalnem istrskem kontekstu, še posebej v odnosu do sodobnih tendenc arheološke discipline na Hrvaškem.

Prevedel Sašo Poglajen.

Sažetak

Ovaj rad je nastao na temlju sustavnog terenskog pregleda na području zapadne Bujštine u Istri, a težište je postavljeno na procjenu mogućnosti i ograničenja primjenjene metodologije u proučavanju arheološkog krajolika. Bit će obrađene tri osnovne teme: teoretske postavke arheologije krajolika (Pogl. 2-4), metodologija terenskog pregleda (Pogl. 5), te interpretacija rezultata sa spomenutog istraživanja kojoj će biti posvećen veći dio rada (Pogl. 6-11). S obzirom na raznovrsnost tema rasprava će se odnositi na više različitih prostornih i konceptualnih konteksta. Metodološki problemi će biti ispitani u okviru terenski istraženog prostora, a pronađeni arheološki nalazi će biti interpretirani u okviru arheološke problematike Istre. Također će se naročita pažnja posvetiti razvoju krajolika Bujštine, prije svega u arheološkim razdobljima koja će biti obrađena, iako je poznavanje lokalne arheologije još uvijek dostatno tek za jedan lapidaran prikaz. Povremeno će biti spomenuti i širi problemi poput metodologije terenskog pregleda na Mediteranu.

Valja odmah istaknuti da arheologija krajolika (*sensu* Novaković 2008) nije koherentna, jasno definirana disciplina poput na primjer arheologije paleookoliša ili zooarheologije, već prije svega jedan pristup u proučavanju arheološkog zapisa (*archaeological record*) koji je usmjeren na širi geografski kontekst. Neki arheolozi radije govore of načinima razumijevanja krajolika negoli o nekom jedinstvenom pristupu („*thinking about the landscape*“: Johnson 2005). Dodatan je problem i suprotstavljanje arheologije krajolika i arheologije prostora u okviru suvremene debate oko procesualnog i post-procesualnog pristupa u arheologiji (Novaković 2008; Tartaron 2003, 31: n. 50). Ovakve podjele valja razumjeti u širem kontekstu polemika u teoriji arheologije, a ishitreno preslikavanje teoretskih postavki na metodologiju terenskog pregleda vrlo vjerojatno će dovesti do značajnog sužavanja interpretacijskog spektra pojedinog istraživanja (*ibid.*). Pristup za koji smo se odlučili u ovom radu je utemljen na sustavnom terenskom pregledu kao temeljnoj metodologiji čime je naglašen kvantitativni, prostorni aspekt pronađenih arheoloških nalaza.

Jedan od poticaja za upuštanje u zahtjevnu polemiku oko metodolgije i primjene sustavnog terenskog pregleda o ovome radu jest i vrlo neobična situacija u Hrvatskoj gdje su unatoč značajnijem broju vrlo uspješnih projekata koje su 1980-tih organizirali mješoviti timovi hrvatskih i stranih arheologa, sustavni terenski pregled kao metoda i arheologija krajolika kao koncept naišli na razmjerno slab odjek. Od tih projekata dovoljno je spomenuti istraživanje na Hvaru kao dio šireg projekta na srednjojadranskom arhipelagu (Bintliff, Gaffney i Slapšak 1989; Kirigin 1998) te sustavni pregled u zadarskom zaleđu

nazvan Neotermalna Dalmacija (Chapman, Shiel i Batović 1996). U posljednje vrijeme projekti koji se jednim dijelom baziraju na metodologiji sustavnog terenskog pregleda su organizirani oko Čepićkog polja u Istri (Komšo, Balbo i Miracle 2007), Gradu kod Nakovane na Pelješcu (Forenbaher i Rajić-Šikanić 2006) te na Lastovu (Bass *et al.* 2009).

Jedan od mogućih uzroka ove situacije jest izrazito teoretsko i metodološko usmjerenje većine projekata, naročito onih iz 1980-tih, dok su problemi koji su aktualni u lokalnoj arheologiji postavljeni u drugi plan ili su u potpunosti zanemareni, kao na primjer tipologije materijala i nalazišta ili neki specifični problemi kulturnog razvoja. Način izrade arheološkog dokumenta (dokumentacije), koji je uvijek izraz primjenjene metodologije, također može biti problematičan s obizorm na zahtjeve lokalne arheologije i način upravljanja kulturnom baštinom. Kako bilo, studija koja je u prvom redu usmjerena na lokalnu arheološku problematiku kroz primjenu suvremene metodologije sustavnog terenskog pregeleda mogla bi biti dobar poticaj za daljnji razvoj arheologije krajolika u Hrvatskoj. Stoga je u ovome radu naročita pažnja posvećena pitanjima koja su već duže vrijeme aktualna u hrvatskoj arheologiji, a koja se nisu na zadovoljavajući način riješila tradicionalnom topografijom, poput problema naseljavanja na otvorenom (tj. izvan velikih naselja) u prapovijesnim razdobljima ili veličine zemljoposjeda u vrijeme antike.

Sustavni terenski pregled Umaške okolice je proveden u tek dvije (pionirske) istraživačke kampanje (2007 i 2008) u kojima je prekriveno oko 1600 ha. Dobiveni podaci su stoga još uvijek vrlo fragmentarni i u mnogome nedostatni za upuštanje u razrješavanje određenih problema arheologije Istre ili šire, ali ipak pružaju razmjerno dobru podlogu za razmatranje prednosti i nedostataka primjenjene metodologije. Osnovni doprinos ovog rada bio bi u tome da uspješno dokaže da je sustavni terenski pregled metodologija koju je moguće uklopiti u već razvijene pristupe u proučavanju lokalne arheologije te koja također može otvoriti jednu novu perspektivu kakva zasigurno nedostaje tradicionalnom pristupu baziranom na istraživanju pojedinih "značajnih" nalazišta. Valja također istaknuti da je terenski pregled organiziran kao muzejski projekt, bez značajnije suradnje sa znanstvenim institucijama, što je omogućilo jednu fleksibilnu metodologiju i slobodniji plan istraživanja. Svakako da je takva organizacija u većoj mjeri nedostatak, što će naročito biti vidljivo kod manjkave analize nalaza. U konačnici, primjenjena metoda istraživanja predstavlja kombinaciju tradicionalnog topografskog i suvremenog sustavnog terenskog pregleda.

Nakon općeg pregleda teoretske pozadine arheologije krajolika (Pogl. 2.-4.) te napose metodologije sustavnog terenskog pregleda (Pogl. 5.), pažnju ćemo usmjeriti na terenski pregled u okolici Umaga i razmatranje dobivenih rezultata u kontekstu arheološkog krajolika Bujštine. Također će biti riječi o paleookolišu Bujštine, unatoč tome što nisu izvršena istraživanja u tom smislu, te razmotrena neka

problematična pitanja o odnosu čovjeka i okoliša u prošlosti. Naročitu pozornost smo usmjerili na tzv. formacijske procese koji su utjecali na stvaranje površinskog arheološkog zapisa i krajolika u cjelini (poljoprivreda, parcelacije, promjena morske razine itd.).

Uspješnost primjenje metodologije istraživanja će biti procjenjena na bazi kvantitativnih podataka o gustoći pronađenih nalazišta s posebnim osvrtom na ostale parametre koje nije moguće kvantificirati, a koji također utječu na krajnji ishod istraživanja (npr. kalendarski termin istraživanja i sl.). Na temljelju tih parametara bit će demonstrirana složena korelacija između intenziteta terenskog pregleda i uspjeha u pronalaženju nalazišta s obzirom na njihovu dataciju. Također ćemo se osvrnuti na važan problem izostanka arheoloških nalaza iz nekih perioda, naročito srednjeg vijeka, u svjetlu primjenjene metodologije.

Većina pronađenih nalaza se može opredijeliti u tri razdoblja: mlađu prapovijest (brončano i željezno doba), antiku (1.-6. st) i novi vijek (16.-19. st), od kojih ovo poslijednje neće biti analizirano. Prapovijesni period će biti obrađen kroz analizu više različitih tipova nalazišta koja su istražena različitim terenskim metodama (intenzivni sustavni pregled, ekstenzivni pregled, intenzivni strukturni pregled i sl.). Naročita pozornost će biti posvećena gradinskim naseljima koja su dokumentirana više ili manje detaljnim topografskim snimcima. Ostale vrste nalazišta uključuju gomile, nekropole tumula, nalazišta u vrtačama te nalazišta na otvorenom. S obzirom na značajan problem u datiranju nalazišta, prije svega zbog siromaštva površinskih nalaza, pokušat ćemo definirati osnovne fakture prapovijesne keramike te na taj način uspostaviti grubi kronološki okvir unutar kojega je moguće provesti daljnja razmatranja. Analiza vidljivosti (*visibility analysis*) će biti iskušana na nekoliko lokaliteta smještenih na karakterističnim topografskim položajima. U zaključku ćemo pokušati sintetizirati dobivene rezultate u kontekstu prapovijesne arheologije Istre, te predložiti model prostorne organizacije brončanodobnog kulturnog krajolika. S obzirom na značajan udio nalaza koji su dokumentirani na otvorenom, tj. izvan gradinskih lokliteta, predloženi model postavlja naglasak na raspršeni sustav naseljavanja u vrijeme ranijeg i srednjeg brončanog doba. Distribucija nalazišta na širem prostoru upućuje na stožernu ulogu gradinskih nalazišta u tom sustavu što ne implicira nužno i središnju ulogu u smislu hijerarhijske organizacije. Kronološki razvoj tog obrasca je slabo vidljiv u nalazima dobivenim terenskim pregledom, no s obzirom na širi kontekst Istre u vrijeme mlađe prapovijesti čini se da je sasvim vjerojatno da je sustav naseljavanja do vremena željeznog doba evoluirao prema hijerarhijskom modelu u kojem gradinska naselja preuzimaju ulogu redistribucije dobara. To je naročiti dobro vidljivo u količini importiranog materijala iz naselja Sv. Petar, koje je također ovdje obrađeno.

Nalazi iz rimskog razdoblja u mnogome odudaraju od prapovijesnog te omogućuju primjenu potpuno različitih analitičkih metoda. Prije svega, sva su nalazišta dokumentirana sustavnim terenskim pregledom na obradivim površinama te se isključivo sastoje od površinskih koncentracija artefakata. Formalne razlike između nalazišta su stoga razmjerno slabo izražene, a zbog homogenosti istraženog terena (pojas crvenice u obalnom pojasu) ta situacija vjerojatno donekle odražavava ujednačenost izvornog antičkog ruralnog krajolika. Polazeći od te pretpostavke primjenit ćemo više rudimentarnih metoda prostorne analize poput kartiranja grupacija nalazišta i Voronojevog dijagrama. Temeljem tih analiza bit će predložen hijerarhijski model u kojem središnju ulogu imaju ruralni agrarni kompleksi, vjerojatno vile rustike, okružene manjim pomoćnim sadržajima. Distribucija nalzišta će biti protumačena u svjetlu pretpostavljene lokalne komunikacijske mreže. Također će ukratko biti razmotren problem prosječne veličine rimskog agrarnog posjeda (*fundus*) ali bez pretenzija na njegovo razrješenje već prije svega s obzirom na teoretske i metodološke prednosti i nedostatke pristupa koji je utemljen na sustavnom terenskom pregledu.

Poglavlje 11 je posvećeno intenzivnom strukturnom pregledu značajnog kasnoantičkog nalazišta Sipar. Riječ je projektu koje izveden usporedo sa sustavnim terenskim pregledom te predstavlja primjer nedestruktivnog istraživanja značajnijeg („urbanog“) lokaliteta.

Unutar ovog sumarno opisanog okvira bit će razmotren ili tek načet veći broj vrlo disparatnih tema. Riječ je o eklekticizmu koji je posljedica kako teme, tako i metode istraživanja. Arheologija krajolika je iznimno složeno znanstveno područje koje u svojoj bazi objedinjuje geologiju, pedologiju, ruralnu povijest te arheologiju. Već sama činjenica što smo se odlučili za obradu tek dva od više poptuno različitih povijesnih razdoblja koja su dokumentirana u terenskom pregledu upućuje na složenost problematike pred kojom se nalazi istraživač, da ne spominjemo pitanja poput evolucije lokalne pedološke podloge, stvaranja parcelacijske mreže ili nipošto beznačajnog problema dubine oranja i ostalih detalja lokalne poljoprivredne prakse. Stoga trenutno nije moguće izraditi cjelovit model razvitka povijesnog krajolika zapadne Bujštine na temelju dosadašnjih istraživanja, niti bi takav zadatak mogao svladati jedan istraživač. Na ovome mjestu želimo prije svega ponuditi temeljitu procjenu metodologije sustavnog terenskog pregleda kako u kontekstu arheologije Mediterana, tako i u onom lokalnom, istarskom, te naročito u odnosu na suvremene tendencije arheološke discipline u Hrvatskoj i svijetu.

1. INTRODUCTION

This thesis presents an attempt to assess the landscape approach in archaeology, based on a case study of the region of Bujština in Istria, Croatia. Three closely related themes will be dealt with: basic theoretical concepts in landscape studies (Chapters 2-4), fieldwork methodology (chapter 5), and, for the most part, an attempt to interpret the surface archaeological record from the studied area (Chs. 6-11). Most of the discussion will address two basic scales: the surveyed area, especially in relation to methodological issues, and the western Bujština study area as the frame for historical interpretation.

It should be stressed straight away that landscape archaeology is not a coherent, well defined discipline within archaeology, like for example environmental archaeology or archaeozoology, but rather an approach to interpreting the archaeological record which operates on a larger scale than site- or artefact-oriented approaches. It may even be more appropriate to view the subject in terms of "thinking about landscape" (sensu Johnson 2005). This situation is further complicated by the juxtaposition of landscape and spatial archaeology, as well as of landscape archaeology and the landscape approach, which correspond to the contemporary rift between processual and post-processual archaeology (Tartaron 2003, 31: n. 50). Contradictorily, while landscape archaeology was considered as the replacement term for total archaeology by some scholars in the 1970s (Gojda 2004, 3.1), today it seems to correspond better to postprocessual perspectives (Knapp and Ashmore 1999; Layton and Ucko 1999; Novaković 2003, 168). Such distinctions can be considered as artificial in most cases, while at the same time multiple archaeologies of the landscape will continue to coexist, drawing on a variety of agendas and rooted in different research traditions (cf. Novaković 2003, pp. 191-202). Our approach is based on the systematic field survey project and shares many similarities with other Mediterranean projects using such methodology, chiefly the emphasis on quantitative and spatial analyses.

Although there is an enormous amount of available literature on landscape archaeology and field survey methodology in particular, its impact on the Croatian research tradition has been almost negligible. This is even more curious when considering the success of cooperate survey projects organized by foreign and Croatian archaeologists on the island of Hvar (Bintliff, Gaffney and Slapšak 1989; Kirigin 1998) and in northern Dalmatia (Chapman, Shiel and Batović 1996). Perhaps the strong theoretical and methodological preoccupation of these projects has been too distant from the problems that concern local research tradition. In any case, a study that will demonstrate a more thorough integration of global issues in landscape archaeology with the specific questions and research climate of Croatian archaeology may

provide a catalyst for further development of more appropriate approach (other than traditional topography). In order to achieve this we will attempt to tackle issues raised previously in the context of Croatian archaeology, even if the data recovered are in many aspects insufficient for reaching safe conclusions. Our purpose is, thus, to demonstrate the potential offered by the landscape approach, as well as to attempt a coherent interpretation of past societies from a wider spatial perspective.

The Umag systematic field survey project is still in its early stage of development and in the two main seasons, in 2007 and 2008, a relatively small area was covered (1600 ha). However, it provides sufficient data for the evaluation of the potentials and shortcomings of the applied methodology in this particular area. The specifics of the Umag survey project may also be relevant for our purpose. Unlike typical field survey projects in the Mediterranean and elsewhere, it was organised as a museum project, unrelated to other higher level scientific institutions. Consequently, it started with a light theoretical load and with rather modest expectations. Already by the second season, the project evolved into a typical intensive systematic field survey, retaining, however, non-systematic methodologies that have proven to be valuable in the previous season. To a certain degree the Umag survey presents a blend between eclectic and systematic approaches, i.e. traditional topography and the modern systematic, off-site oriented field survey.

After a general treatment of otherwise complex issues of landscape archaeology and in particular field survey methodology (Ch. 1-5), we shall proceed to a detailed case study of the western Bujština landscape. Even if the Umag survey did not include any environmental research, some important issues in the relationship between the natural setting and past cultures will be discussed. The applied methodology will be evaluated afterwards on the basis of the recovery success of sites from several main archaeological periods. The analysis of the survey data will almost exclusively deal with the later prehistory (Bronze-Iron Ages) and the Roman period, as these periods are the best represented in the dataset.

In the analysis of the Bronze and Iron Age periods we shall deal with several categories of sites that were researched with different methodologies. Special attention will be paid to detailed biographies of hillfort sites which were recorded using detailed feature survey. Other types of sites that were found and recorded in non-systematic strategy will also be described in detail (cairns and necropoles). Finally, finds from the systematic field survey will also be discussed in detail, including sites from karstic dolinas researched in 2008. Several analytical approaches will be used. First of all, because of the serious difficulty of dating the sites, special attention will be paid to the study of pottery, particularly pottery fabrics. Visibility analysis will be applied to large hilltop cairns. In the end we shall attempt a synthetic

interpretation of the finds from the spatial perspective and propose a general model of spatial organisation of the Bronze-Iron Age landscape.

The dataset from the Roman period is markedly different from the prehistoric one. In the first place, the data has been entirely recorded in the systematic field survey in the terra rossa plain of western Bujština, so there is much higher homogeneity in the spatial coverage of the dataset. Also, the formal and functional differences between the sites are less pronounced, probably because of the uniform environmental and topographical setting. This situation has enabled application of several simple methods of spatial analysis (clustering, Voronoi cells). Using these analyses we tackle some specific issues, such as the reconstruction of a possible communication network and the possibilities of studying the average property size using primarily field survey data.

Chapter 11 deals with the structural survey of Sipar, a Byzantine and early medieval stronghold situated on a tiny peninsula in the vicinity of Umag. This project ran parallel to the Umag survey and it will provide an example of an intensive, non-destructive site-based approach that can be integrated into field survey projects.

The range of topics that will be dealt is rather long and cannot be listed here. It will be interesting, however, to observe how the two analysed periods pose different problems and demand quite different approaches for their solution, which has a direct impact on the choice of adequate field methodologies.

PART I – THEORY AND METHODOLOGY

2. DEVELOPMENT OF FIELD SURVEY METHODOLOGY: A SHORT HISTORY

2.1 Topography

The traditional type of field survey is simple search and cataloguing of archaeological sites. This style of work has many varieties and is not tied to a specific body of theory. As an antiquarian activity archaeological topography can be traced back to the sixteenth-century Europe (Gojda 2004, 2.1), stemming from classical *chorography,* Pausanias in particular. During the nineteenth century the practice of field recording slowly developed under the influence of military geography by adopting precise measurement techniques from geodesy and cartography (Gkiasta 2008, 5). By the turn of the century topographic survey was a well-established method, which fitted well into the territorial concepts of cultural-historical archaeology. Just like the archaeology of the time, topography was based on cataloguing and classification of sites in order to assess basic site/artefact chronologies and distributions. Typically the stress was on prominent sites that were characterised by significant topographic features or architectural remains and showed good excavation potential. The work of Carlo Marchesetti in Istria and Venezia Giulia at the end of the nineteenth century is a typical example. Marchesetti's catalogue of 455 protohistoric hillforts (*castellieri*) is still widely used and his sketches of hilltop sites still appear regularly in archaeological publications (Marchesetti 1903; Novaković 2005, 108). In Germany an outline of a systematic procedure was elaborated by A. Tode in 1926 as *Archäologische Landesaufnahme,* and further developed by H. Jankhun (Novaković 2003, 76-78). It is based on thorough preparation by collecting information from the literature, as well as museum and private collections, followed by extensive fieldwork (Janssen 1986, 66). Topographic survey has a strong tradition in Italian archaeology, foremostly through the research of Topographic Institute at the University of Rome, which culminated in its extensive catalogues of *Forma Italiae*. Over time, their technique evolved from the mapping of architectural remains to recording ploughsoil scatters and similar "smaller" remains (Cambi and Terrenato 1994, 31; Gkiasta 2008, 5).

The topographic method may be regarded as the first scientific approach to archaeological landscapes that was based on careful recording and systematic approach, and is still the prevalent method in regions with poor research history due to its efficiency and economy. Its basic characteristic is discontinuous coverage of space (*approche discontinue* as C. Raynaud labelled it (Raynaud 1989, 60), thus allowing

archaeologists to select specific types of sites regardless of the vast surfaces that may separate them. However, the shortcomings of the method are readily apparent. For instance, perhaps under strong influence of the topographical work of Carlo Marchesetti, the idea of later prehistory (i.e. metal ages) in Istria is still almost exclusively confined to hillforts (apart from the occasional large unfortified settlement) and adjacent cemeteries (cf. Buršić-Matijašić 2007). Only recently have the first open air sites from later prehistory in Croatian Istria been published, while several recent rescue surveys have demonstrated that it is most probable that they populate the landscape quite densely (see Ch. 9.3.4). Therefore, although the selective, discontinuous survey has several advantages, it is extremely biased in the final results and more often than not an inappropriate tool for solving problems other than local typologies.

2.2 Settlement archaeology

The ideas of holistic study of human settlement and its geographic and ecological surroundings have been introduced to archaeology by concepts of anthropogeography at the beginning of the twentieth century. The prominent place is held by the German school, which was shaped by considerably different approaches. Gustav Kossina was the first to use the term *Siedlungsarchäologie* but his approach, centred on ethnic genesis and without a developed methodological apparatus, did not gain much recognition among German archaeologists before the First World War (Novaković 2001, 37). However, by the end of the nineteenth century the amalgamation of typology with ethnicity and spatial distributions with the notion of territory became one the most prominent themes in early cultural-historical archaeology. It was Kossina's opponent C. Schuchardt who established and developed settlement archaeology in terms of methodology that stressed the importance of reliable, meticulous excavation of settlement sites (in opposition to the cemetery bias in the archaeology of the time), and in terms of theory that was more firmly based in the anthropogeographical perspective of the man-environment relationship (Novaković 2003, 56). These advancements did not introduce important conceptual improvements to survey methodology, but have, rather, incorporated survey more securely into the archaeological discipline and stressed the need for systematic data recovery. Kiekebusch, for instance, considers *Landesforschung*, a topographic and bibliographic survey, as the first step in archaeological research that ends in *Kulturarchäologie*, that is, culture history (Novaković 2001, 38). Some ideas of the German anthropogeographic school are still current, for instance *Siedlungskammer* theory, dealing with concepts of regional self-sufficiency, and the long-term relationship between man and environment which has inspired the approach of John Bintliff (Bintliff 2002, 32).

What, on the other hand, stimulated an enormous advancement in the methodology of landscape studies in the first half of the twentieth century is aerial reconnaissance, pioneered by O.G.S. Crawford in Britain in 1920s. Not only did he use aerial imagery to illustrate the diversity and quantity of traces of past structures in the landscape, but also successfully proposed their dating and interpretation. Crawford introduced high standards for topographic fieldwork, a discipline that has advanced considerably in Britain as "field archaeology".[1] His extensive experience on the ground and in the air during his work as an inspector in Ordnance Survey has enabled his work to set new standards in mapping and monument recording which has subsequently consolidated a remarkable tradition of non-destructive landscape survey in Britain (e.g. Taylour 1974).

In spite of both methodological and theoretical improvements in landscape archaeology before the Second World War, the principal survey method has remained traditional reconnaissance. The idea of systematic data collection did not extend beyond thorough field and archival research. The turning point in the development of survey methodology are large scale projects that took place just after the war, aimed at answering the "big" questions, especially in the context of the North American version of settlement archaeology. Their approach, designed to provide reliable explanations of large-scale processes, founded in functionalist and ecological perspectives that were dominant in the social sciences, has put a high demand on research methodology. G. Willey, for instance, was the first to publish a research programme prior to fieldwork (Novaković 2003, 97). His work in the Viru valley is especially significant. There he has successfully applied a concept of settlement pattern as a way to understanding more sophisticated aspects of past cultures such as internal organisation, institutionalisation or hierarchies, besides the purely ecological explanations of human adaptations (Trigger 1989, 282). Clearly the pattern cannot be understood without a systematic field research that will bring to light all types of settlement within a region.

For the Mediterranean area the turning point were the University of Minnesota Messenia Survey done in the 1950s and 1960s, as well as the Ager Veiantanus (South Etruria) project by the British School at Rome, that developed gradually from the 1950s to the 1970s (McDonald 1972; Novaković 2003, 138-140). What characterises the UMME is the aim of addressing big questions and its explicit regional perspective. The method was designed specifically for an even coverage of a study area 3800 km^2 large and consisted of visits to locations previously identified as potential sites, mostly by the study of military aerial imagery and by other topographic methods. The survey, extensive and non-systematic by today's standards (see Ch. 5.4.3), was planned alongside excavations and other complementary field techniques

[1] This term first appeared in print in 1915 and was reminiscent of "field scientist", a phrase referring to those who left their cabinet in order to study the subject in its natural environment (Gojda 2004, 3.1).

(McDonald 1972, 6). The typical feature of the project is its multidisciplinary approach that is still remarkable – McDonald lists over a dozen disciplines that have contributed (McDonald 1972, 9).

The South Etruria survey, initiated by J. Ward-Perkins, has taken a different trajectory. Rather than set against a specific research agenda, the survey evolved according to local circumstances, primarily the extraordinary richness of surface assemblage that had just begun to be destroyed by modern agriculture and urbanisation (Novaković 2003, 139; Dyson 2003, 37-8). In more than twenty years roughly 2,000 km^2 were covered and more than 1,000 sites recorded (Novaković 2003, 139). The project started modestly but eventually developed into a systematic procedure and what is considered by some to be the most influential project in the early days of Mediterranean field survey (Athanassopoulos and Wansnider 2004, 3).

It seems that only the environment of large scale projects finally enabled the adoption of more sophisticated field methodology. The functionalist perspective of both American and European settlement archaeology was faced with practical issues of very complex surface records, consisting of large numbers of archaeological sites. It also seems that the American approach, drawing closely upon anthropological studies and stressing formalised, empirical methodologies, was more decisive in the early development of regional survey, while the European schools remained satisfied with topographic fieldwork, even after the recognition of the complexity of landscapes due to aerial reconnaissance. The South Etruria project is a notable exception. The other reason for this course of development may be in the capability of organising truly regional studies in archaeologically rich areas like the Mediterranean, Mesopotamia and Mesoamerica, that require large crews and abundant funding. The case of the Etruria survey also suggests a practical side of the development of survey methodology, not directly tied to an explicit set of questions and not defined by an *a priori* formulated methodology.

2.3 Processual archaeology and systematic field survey

The impact of the New Archaeology on landscape archaeology in the 1960s and 1970s can hardly be overestimated. In contrast to settlement archaeology, the main focus of research, as stated by L. Binford, is a cultural system which operates in multiple locations simultaneously. The main level of research is an artefact, not a settlement (Novaković 2003, 110). Perhaps it is precisely at large-scale perspectives that the New Archaeology or processual approach found its optimal modus operandi (Cherry and Gamble 1978, 22). Complex cultural systems and their adaptation strategies can best be observed within large cultural regions, which consequently need to be studied more intensively and more holistically. Strictly empirical epistemology based on hypothesis testing, strongly advocated by Binford and others, demanded

development of more reliable methodologies based on objectivity and formalised procedures. The stage had been set for the further development of survey methodology.

Several aspects of the processual approach were well-suited to landscape research. Its strong ecological orientation, stemming from the cultural ecology of Julian Steward, often criticized as deterministic, has continued and reinforced the functionalist tradition in landscape archaeology stretching back to German *Siedlungsarchäologie* or British regional studies.[2] Equally important is the introduction of a range of spatial analyses borrowed from geography and ecology, that opened what may be termed as the most rapidly expanding field in landscape research, the geostatistical approach that proliferated following the introduction of the GIS in the 1980s (Novaković 2003, Ch. VII, 155-167).

"Systems thinking" has offered a wide theoretical basis for the development of comprehensive spatial research. Settlement archaeology had already embarked upon this approach, and actually shared a related functionalist perspective (Trigger 1967; Novaković 2003, 94ss). One of the problems, however, was its theoretical deficiencies in terms of relating settlement patterns to complex social models. The idea of equalling the settlement with social categories is problematic (although very useful and still quite widespread) (Novaković 2003, 100ss), and has also proven to be unsuitable for a wide range of evidence encountered in field surveys. New Archaeology has stimulated more intensive, artefact-based research, which led to the development of the concept of non-site research that could be deployed more successfully in the study of nomadic or rural societies (Foley 1981; Thomas 1975). A revived interest in ethnology, linked to the American idea of "archaeology as past anthropology" (Binford 1962: as cited in Trigger 1989, 295), also produced a range of valuable information on the man-environment relationship, which often cannot be apprehended through research of isolated points in the landscape (e.g. Binford's work among the Eskimo (David and Kramer 2001, 119-122). Site catchment analysis, developed by E. Higgs and C. Vita-Finzi in the early 1970s is a good example of an aspiration towards integrating the environment into the research of archaeological sites (Bailey 2005). Another important theoretical vein is spatial archaeology as conceived by D. L. Clarke, founded on the application of adapted methodology from geographical studies (see Ch. 3.1 for further discussion).

[2] The definition of culture as "an extrasomatic means of adaptation" (Binford 1972, 198, as cited in Novaković 2001, 71) originates with Leslie White, who postulated a somewhat radically materialistic, functional and neo-evolutional definition of society. The approach was prone to environmental determinism as it almost completely denied individual agency and put all the weight on the large-scale organisational context, drawing on notions of progress, energy consumption and adaptation (Eppich 2001).

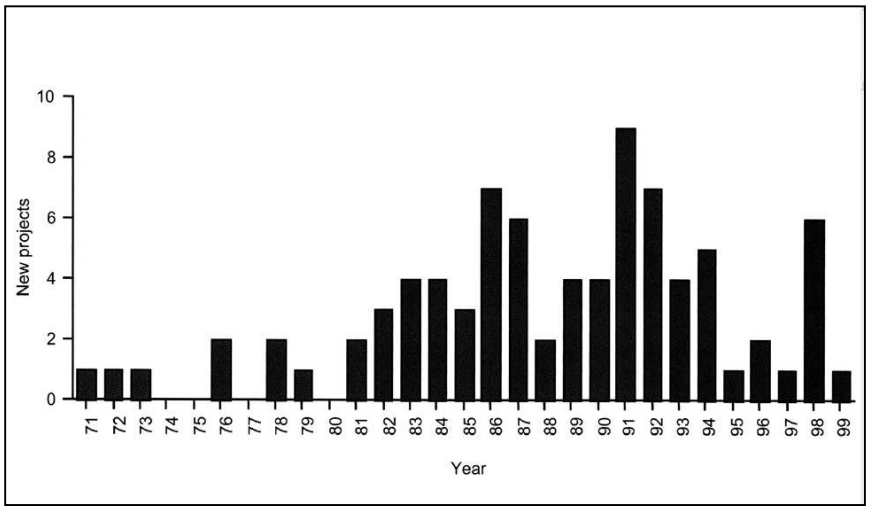


Figure 1 Annual start-ups of new survey projects in Greece in the period from 1971 to 1999 (Alcock and Cherry 2004, 2: fig 1.3)

After a period of consolidation in the 1970s, a "New Wave" (Bintliff 2002, 28) of field survey has flooded the Mediterranean countries (Figure 1). Typical methodology is based on systematic walking in arrays of 5 to 25 meters (sometimes up to 50). In contrast to the site-based approach, the recording is organised upon a continuous raster of field units, while over time some sort of off-site recording has been adopted by the majority of projects. The widespread introduction of rigorous sampling techniques in research designs, as well as the concept of sampling effect imposed by the choice of field technique, is, perhaps, the crucial moment in the development of systematic field survey methodology. An important new field of research has been introduced by actualistic studies (Rossignol 1992), i.e. those concerned with methods of interpreting the present (as encountered) field record in terms of past behaviour – also termed low (and middle) range theory by L. Binford. Basically these are concerned with taphonomy and the formation processes of the archaeological record, a field of study that has drawn much attention after the seminal work by M. B. Schiffer (1976; 1983; 1996).

The causes of the proliferation of systematic field survey cannot be boiled down only to theoretical advances. The excavation in the Mediterranean has become increasingly difficult to organise, due not only to expenses but also to more restrictive permit politics, notably in Greece. At the same time, the number of researchers is constantly rising, while the academic climate demands quick and fresh results. Another factor that should not be omitted is the widespread adoption of mechanized agriculture that has opened (and destroyed) immense surfaces of Mediterranean landscapes, as already mentioned with regard to the South Etruria project. Systematic field survey has followed its own trajectory, undeniably under

strong influence of the processual school, and during the 1970s and 1980s developed into a fully-fledged method with significant feedback upon general theory as well (e.g. the off-site concept etc; see Ch. 3).

2.4 Post-processual Archaeology

Postmodern landscape archaeology, or Post-processual as it is usually called, has put forward a range of serious critiques of the theory and practice of the discipline. The debate began in Anglo-Saxon universities and postmodern ideas in archaeology are today most popular in North-West Europe and North America. The basic flavour of Post-processual archaeology is typically postmodern in drawing inspiration from Heidegger, Foucault, Giddens, Bordieu, or even the notoriously hermetic Derrida (Shanks 1992, 30), as well as in its denial of the universal validity of the empirical approach. The fundamental critique of the empirical foundations of modern archaeology, fuelled up by very strong positivist stance of more ardent proponents of processual school, notably Lewis Binford (Thomas 2005), has created an unbridgeable gap in the basic notions of what archaeology is and in what direction it should be headed. This applies in the first place to the university climate of some Western countries, while the silent majority remains within attested and long-established traditions (Shanks 2008, 2; Shanks 1992, 20).

While they cannot be presented as a "school of thought", the Post-processual approaches actually share a range of common ideas. The overall tendency is to attempt some sort of social archaeology, often with an emphasis on personal experience or agency.[3] The functionalist (processual) approach is critiqued as an enterprise in resurrecting omnipresent systems that operate above and regardless of human beings, who are considered to be reduced to ghosts in the machine (Thomas 2005; Hodder and Hutson 2003, 1). Archaeology, indeed, offers ample ground for this critique. Following individuals in prehistory, together with their worldviews and ideas is a difficult task, especially in the context of landscape archaeology where there is usually no evidence of short- or medium-term actions like those sometimes deducible from excavations. An individualistic approach is hardly applicable here and the notion of "entering people's minds" has become a commonplace in reactions stressing the futility of the task.

[3] We are aware of the fact that postprocessualists may not agree with this (or any) simplification: "The core of post processual archaeology is not a celebration of the individual set in a particular historical narrative, as opposed to the generalizing explanation of processual science" (Shanks 2008, 2). And also: "Post processual archaeology is not the archaeological offspring of a postmodern mentality which denies the possibility of secure knowledge of the past or indeed denies the significance of the past itself in a play upon the meanings of the past for the present, where multiple contradictory pasts can claim equal validity" (ibid.). While Shanks deliberately caricatures the notion of postmodern mentality, it is a fact that the epistemology of postprocessual approach presents a major problem in the debate with positivists (c.f. Fleming 2006).

The issue of new definitions of objectivity has a direct impact on the creation of new methodologies, or better, new ways of archaeological practice. The past exists only in the present; it is a cultural product containing ideological and other cultural pollution otherwise abhorred by modernism. One of the common notions promulgated by postmodern writers is the idealistic illusion of the ultimate reference point – in the case of science, of a concept of objectivity which would ensure the universal value of scientific inference (Shanks 1992, 27). In the context of field methodology the debate essentially boils down to the issue of inseparability of the "raw data" and its immediate interpretation. "Data" can exist only within particular systems of meaning that should in their turn be brought to conscience and exposed. The lengthy debate on this subject does not need to be presented here as it has become a commonplace (Hodder and Hutson 2003, 18). However, in spite of the long years of debate, a field practice that can be fully integrated within the discipline while designed for interpretative approaches to archaeological landscape is still in its infancy. In his application of phenomenological ideas to landscape archaeology, Christopher Tilley has developed a field methodology that, to the best of our knowledge, can be singled out as a truly hard-boiled postprocessual approach to fieldwork. The basis of his approach is the process of familiarizing oneself with the landscape, a process that can be understood as the acquisition of a dwelling perspective. Being there is knowledge of the first order (Tilley 2004, 218). Although his work cannot be described through a set of strategies or technical solutions that form a distinct methodology, the essential field procedure is writing descriptive accounts, backed up by photography or video recordings. At least half of Tilley's *Materiality of Stone* was written in the field. What is important is a deeper relation with the creative process of writing which "arises in the interaction of self and place" (Tilley 2004, 223). Writing is a process of understanding, slowing down the mind and enabling articulation of thoughts and feelings; it is, furthermore, a means of interaction with the place, rather than just a one-way recording. Field practice includes anything from experiencing the material remains by all the senses to buying postcards or driving in a car in order to acquire different insights into the study area (Tilley 2004, 224-225). The "thick description of the place" that emerges in this manner is a means to understanding it.

In spite of phenomenological inspiration, the work of C. Tilley is essentially reconstructive, resurrecting past landscapes as a prerequisite to higher-level interpretation. From this perspective the results of his fieldwork cannot stand closer scrutiny, as shown by A. Fleming, for instance in some details of local geomorphology, or the expertise in the intricacies of local cultural development (Fleming 2006, 274). Indeed, Tilley is aware that a "'pure' phenomenological approach on its own remains inadequate", and that the study of material culture requires "multidisciplinary perspective and various types of empirical work and data collection" (Tilley 2004, 224). The suggested failure of his account is, therefore, idiosyncratic and not a methodological one.

The other manner of landscape research, as identified by A. Fleming in his critical overview of postprocessual landscape archaeology, is the hyper-interpretive writing pioneered by Mark Edmonds (Fleming 2006, 270). In this approach "interpretation takes up a much greater proportion of the text, relative to the provision of archaeological information and analysis, than would be the case in more traditional archaeological writings" (*ibid.*). The script is characteristically "dense", imaginative, occasionally even lyric. Edmonds has also experimented with imagined vignettes from past life, producing short literary pieces that sporadically interrupt the main text. This new way of dealing with landscape, even if the postmodern ideas about text and processes of its creation and interpretation are acknowledged, is still desktop-based and removed from field experience. We do not consider it equal to fieldwork, which, regardless of the theoretical background, is always both an empirical enterprise and an experience of being-there that inevitably adds specific colour to subsequent research accounts.

A crucial issue in the context of research methodology is the lack of some universal reference system which could allow the use of postprocessual work within conventional scientific discourse [4]. Therefore, as the postmodern archaeology is not (or should not) be a complete (paradigmatic) break with established practice, which is also recognised by post-processualists (e.g. Shanks 2008), this can only mean that the future of field methodology depends on the capacity of integrating the fruits of previous work (regardless of the agenda under which it was produced) and opening enough space for constructive debate.

[4] E.g. "I would like to use their [Tilley's and some other postprocessualists'] interpretation in my work but I am not sure whether I can do so, since my response to the same places may not be the same as theirs" (Bradley 2000, 42)

3. BASIC CONCEPTS OF FIELD SURVEY METHODOLOGY

3.1 Space and culture

The understanding of the relationship between culture and the space it occupies on a regular basis is a crucial one for typical landscape studies (i.e. studies concerned with the distribution and patterning of cultural remains throughout a well-defined piece of land). Simple and self-evident, this statement is also very deceptive. The only term that can be directly understood is the land itself, while "culture" and "space" can take on a myriad meanings, depending on both the explicit and implicit contexts of an intellectual endeavour. This has been stressed many times in the context of the critique of the positivist framework of processual archaeology and its heavy reliance on an abstract, mathematical definition of space, which is too rigid to incorporate many significant aspects of past societies. As mentioned above (Ch 2.4) Post-processual approach has brought an important shift of focus to the internal, culturally defined "place". From the theoretical perspective, the definition of space, usually through contrasting space and place, can be seen as a "paradigm", a starting point for developing different, sometimes incompatible epistemologies (c.f. Novaković 2003, Ch X, 191-202)[5].

3.1.1 Territory

The concept of territory in geography that we adopt here is multifaceted, but always includes a strong social, ideological dimension. It may be defined in terms of administration, jurisdiction, or any other social category, as well as of emotional value, but it is always associated with some form of appropriation of, or sovereignty over space in opposition to other social categories. Spatial distributions of archaeological features have at an early stage induced a territorial approach, as exemplified in *Siedlungsarchäologie* of Gustav Kossina. He attempted tracing past ethnic groups using typological

[5] The opposition of "real", objective, and "ideal", essentially subjective, space is an ancient theme in philosophy. For the latter point of view one of the key figures is Kant, while Feuerbach claims that space and time are essential conditions of being which are detached from human consciousness (O.Enc. 1980, s.v. Prostor: 656-657). This dichotomy is more or less a reflection of the opposition between idealist and materialist epistemology that plays a large role in the history of Western philosophy (O.Enc. 1981, s.v. Spoznajna teorija: 601-602). Therefore the question of empirical and universal versus personal and particular space in archaeology, together with the competing epistemologies of positivist processual and phenomenological postprocessual archaeology, should be seen as distant reflections of a very old debate. One of the causes for strong critique in archaeology since 1980s can be found in the uncritical overuse of empiricism and positivism since Binford and Clarke, who in their turn drew on some old functionalist approaches that previously lacked a theoretical aura (Trigger 1989, 295).

variations of artefacts in time and space, and this idea has soon become one of the key features of cultural-historical archaeology (Trigger 1989, 165; Novaković 2001, 41). In spite of its nationalistic overtones the concept of tracing past political histories by mapping typological differences has been extremely popular (*Kulturgebiete=Volksgebiete* (Novaković 2001, 42), and is probably the most successful spatial concept in archaeology. It seems, in fact, that the ethnic notion of archaeological culture was simply well-suited to the overall cultural climate of Europe at the end of the nineteenth century and that several archaeological schools independently converged into this line of thought (Trigger 1989, 161).

Territory often appears in functionalistic studies as well, sometimes related to concepts derived from biology (e.g. resource reservoir), and sometimes in purely social terms. It should be noted, however, that Lewis Binford avoided the term because of its cultural connotations (Novaković 2001, 73), and that the processual school did not engage with problems of the ideological component of territoriality in general. A typical territorial assumption underlies the standard interpretation of prehistoric hillforts in terms of the control and defence of discrete geographical areas (Buršić-Matijašić 2007, 525). This subject will be further discussed in the second part of this thesis.

3.1.2 Resource reservoir

The society-environment relationship occupies a central position in the functionalist approach to landscape that stretches back to the influential work inspired by anthropogeography at the beginning of the twentieth century (Novaković 2003, 34), for example the approach of Cyril Fox (*idem*, 69). This tradition has been continued in processual archaeology, especially in the US, where the approach of cultural ecology, developed by Julian Steward, was applied to archaeology (*cf. supra*). The adaptive point of view is very characteristic of the early processual school, which considers environment as determinant for a range of possibilities for the survival of human communities. Space is a resource reservoir. The ecological approach seems much better suited for hunter-gatherer economies, which can be shown to depend much more on natural resources, than for more complex societies, and Binford himself preferred Palaeolithic studies on short-lived sites (Novaković 2001, 72). An important method developed in this tradition is site catchment analysis, first applied by Vita-Finzi and Higgs in 1970 (Bailey 2005, 230). It is essentially an adaptation of a geographical method and has introduced concepts of *site exploitation territory*, in which most daily activities of the occupants occur, and *site catchment*, which is larger and incorporates most annual economic activities (Chapman 2000, 553). Its first application was in the research of the development of early agriculture, in order to examine the local availability of certain soil types in relation to the positioning of sites (Bailey 2005, 231). With the introduction of GIS, catchment analysis has been refined by calculating local friction factors, typically topography, that has enabled to

translate simple geometric (usually concentric) areas into complex surfaces that correspond more closely to probable difficulties in human movement over the terrain.[6] The problems of site catchment analysis can be summarized as stressing environmental determinism and assuming a pivotal position of a site in a rather static social (economical) structure.

With the introduction of GIS systems in archaeology, culture-resource analyses have received a new impetus. A classic example is the work of V. Gaffney and Z. Stančić on the Adriatic island of Hvar, which was published as a showcase for the new analytical methods offered by the software that has become widely available (Gaffney and Stančić 1991). Site catchment analysis was improved by relief calculation (cost surface) and then compared to availability of different soil types. By simple statistics an association of both stone cairns and Roman settlement with good soil was also demonstrated (ibid). Considering the amount of environmental GIS studies in landscape archaeology, the ecological approach remains very attractive, especially in the context of systematic field surveys that are often designed to facilitate subsequent quantitative analyses.

3.1.3 Spatial archaeology of D.L. Clarke

A quantitative spatial approach that was better suited to complex societies was promoted by D. L. Clarke in the late 1960s and 1970s. His "spatial archaeology" relied on a set of geographical concepts that have proven to be appropriate for analysing archaeological data as well. The basic approaches listed by Clarke draw upon the theory of Von Thünen dealing with urban agglomeration and its concentric zones of influence/exploitation, the concept of optimal site location in the infrastructure and settlement network developed by Weber, and finally, Christaller's advanced central place theory that sought to explain the development of complex urban settlement patterns (Clarke 1977). While spatial archaeology did not establish itself as a distinct subdiscipline, perhaps because of the academic climate (Gojda 2004, 3.1), the proposed geographical methods have gained much popularity and are widely used. However, problems stemming from the origin of these approaches still hamper their application. The point that the analyses are borrowings from geography explicitly designed for industrial societies, and therefore rely on the rationales of "least cost" economy, i.e. monetary efficiency, or "rationalising" principles of societal organisation, has been acknowledged from the outset of their application in archaeology (Clarke 1977, 27). Nevertheless, as the theories are well-suited, not only to the positivist tendency in the discipline, but also to the nature of archaeological data (geographical distributions of material products), they continue to

[6] It should be noted that the idea of using walking time rather than just the spatial distance was envisaged early in the development of the method (Bailey 2005, 231), but the problem was to obtain this kind of data efficiently before the DEM-based calculations.

be very attractive for archaeologists who, more or less successfully, try to counter-balance their inherent biases.

A very similar path has been taken by the French ARCHEOMEDES team, a group of archaeologists, historians, and geographers gathered on a larger EU project that focused on the environmental history (anthropic desertification processes in particular) of Mediterranean landscapes (Pumain and van der Leeuw 1998, 1). The key concept presented in the opening chapter of the collaborative work *Des oppida aux métropoles* is the auto-organisation theory, a radically functionalist approach that has been popular in geography, essentially a variant of systems theory. A spatial system is "l'ensamble de cinq fonctions interdépendantes (appropriation, exploitation ou utilisation des ressources, habitat, circulation, subdivisions pour la gestion politique ou administrative) qui définissent l'amenagement de son territoire par un groupe, et lui confèrent des charactères spécifiques, distinct de ceux des regions environnantes" (Pumain and van der Leeuw 1998, 15). This succinct definition presents the basic concepts that have been embraced as what may still be the standard approach in spatial archaeology, which is based on resource management (soil, water etc.), networks, and the hierarchical aspects of social organisation. The auto-organisation refers to an inherent tendency of the system to structure itself, without the need of a significant investment of energy from the outside. This effect is an outcome of a complex interplay of constituents of the system that can be studied on different levels, from the so-called microscopic level, comprised of the basic elements and their interactions (settlements, households etc.), to the large-scale, "macroscopic" level. It is this scalar organisation that bears vital importance for methodological issues, as it is believed that large-scale structures or processes can be studied through the interplay of smaller elements that constitute them.

3.1.4 Space as place

The Post-processual era has brought radically different approaches to landscape studies. Sometimes these take the form of stressing the cultural aspect of the landscape in opposition to the environmental approach, as exemplified by the work of the influential geographer Yi Fu Tuan: "[environment] is a given, a piece of reality that is simply there, landscape is a product of human cognition, an achievement of the mature mind" (1979, 90: as cited in Ingold 1993, 156). This land-scape, a cultural construct, can be studied on its own terms, as in the works of C. Tilley (see ch. 2.2.4). Others point to the inadequacy of the simple Cartesian nature-culture dichotomy, where the natural part constitutes a passive, neutral background for human activities, and search for concepts that can transcend this dualism, for instance the *taskscape* of Tim Ingold (1993).[7] Ingold's sophisticated idea draws upon the phenomenological concept

[7] "The environment is no more 'nature' than is the landscape a symbolic construct" (Ingold 1993, 156).

of dwelling. A taskscape is composed of practical activities (tasks) that are expressed in both temporal and spatial terms, and represent individual *acts of dwelling* (Ingold 1993, 158). In this way the temporal dimension that has to be understood in terms of personal experience (activity) in the context of preindustrial societies can be closely related to the spatial dimension through human *performance.*

Figure 2 Meotoiwa: the wedded rocks near Isa, Japan that symbolise the divine marriage of Shinto deities.

One of the basic concepts of postprocessual approaches to landscape is humanized space, space consisting of, and experienced through, places. Since place has a geographical, empirical component, it offers safer ground for considering empirical methodologies. However, contrary to external, abstract space, place is a meaningful construct; it can be understood only within a wider cultural framework. Among other things it is a matter of social projection, as exemplified in the work of Bruno David on Aboriginal landscapes in Australia that we shall briefly present. His departing point is the well-documented folklore of Dreamtime, an age and a process of shaping the world. The use and understanding of both natural and cultural landscape features are deeply immersed in this system of thought, which is difficult to define in Western terms. B. David considers Dreamtime in terms of "preunderstanding", a concept developed by Hans-Georg Gadamer with relation to the works of Heidegger; "Preunderstandings are the culturally conditioned conceptual frameworks that guide interpretations of things" (David 2002, 3). For instance, when a previously unknown landscape feature is discovered, the Aboriginal elders are summoned to inspect the place and to explain it in terms of Dreamtime stories of the surrounding landscape (David 2002, 6-7). This way the new phenomenon is incorporated into a well- established system of places.

One sobering critique of the archaeological landscape approach comes from those involved in landscape and heritage management. Their perspective is essentially contemporary, concerned with both

physical state and values projected on the landscape, and does not cope well with the approach of archaeology which is essentially reconstructive. Considering the enormous proliferation of systematic surveys in the Mediterranean by American and British teams since the 1970s and their influence on the landscape management, G. Fairclough and P. G. Møller pose a doubt as to "How far this was actually a landscape research as opposed to a merely new approach to space and scale" (Fairclough and Møller 2008, 22). The archaeological stance is not "contemporary, temporary integrative" (*ibid.*) and may lack some important features necessary for the other disciplines involved into landscape research.

3.2 The concept of surface archaeological record

The specific character of archaeological remains visible on the soil surface and the development of survey methodologies specifically designed for its research have both contributed to the emergence of the concept of a unique research context, the surface archaeological record, that has to be understood in its own terms. In contrast to remains found in the process of excavation, surface remains are usually in a much more deteriorated state of preservation and in most cases lack stratigraphic relationships. However, the spatial relationships of surface remains offer a wide, regional perspective that cannot be compared to narrow trenches concentrated on a tiny portion of a single settlement.

The study of aerial imagery after the First World War in Britain led O.G.S Crawford to liken the landscape to a palimpsest in a constant state of rewriting and erasure, and this early dictum has become a commonplace in general discussions of field survey methodology.[8] Field systems, roads, settlements, and other cultural features have been rearranged, rebuilt, or erased on countless occasions, producing an image that is very complex and difficult to interpret. The same applies to ploughsoil sites that are usually visible as multi-period scatters of surface artefacts.

Surface research may thus be defined as a subdiscipline within archaeology that deals with a specific setting while applying specific methodologies that emerge from both the nature of the surface archaeological record and regionally oriented questions. This argument can often be found in varying forms and degrees, from implicit to explicit statements, in works of field survey practitioners, especially in the early days of field survey methodology when the academic position of the new approach had yet to be established (e.g. Cherry 1983, 389; De Guio 1995, 332). In the US the term "surface archaeology" is widely used, for instance in the title of the collection of papers edited by A. P. Sullivan (1998).

[8] "The surface of England is like a palimpsest, a document that has been written on and erased over and over again; and it is the business of field archaeologist to decipher it" (Crawford 1953, 51: as cited in Johnson 2005, 58).

Usually, the notion of the surface archaeological record is used to evaluate its relationship with the subsurface one, chiefly in terms of representativity, one of the fundamental issues in field survey methodology. Do discovered scatters represent original archaeological sites, and if so, how faithfully? The only method available for verifying the field survey data is by comparison with buried deposits that are usually much better preserved and much more informative. This, however, entails many problems, even besides the unrealistic task of excavating a large number of sites typically recorded by field surveys. Ploughsoil, the usual and most appropriate environment for field survey in Europe (it is worth noting different, arid surface environments in the southwest US, Africa or the Near East), contains various artefact assemblages that emerge from destroyed, stratified layers. In general it can be assumed that they reflect the artefactual record of the site to a certain degree. However, the mechanism of surface scatter formation cannot be expected to produce a representative sample of the buried stratigraphy. This applies not only to the effects of artefact relocation or sorting by size, but also to selective unearthing of site phases, as those laying deeper have less chance of appearing on the surface (see p. 32). It has also been shown that in a more stable environment many artefacts never enter into buried deposits and, furthermore, that they may constitute functionally different assemblages than those that were for some reason buried in the ground. The two assemblages could be complementary, representing different aspects of the same site biography (this issue is dealt with in Ch. 4.4). In short, artefact scatters cannot be directly compared with buried sites simply because they represent their distinctive constituent rather than subsample of their buried strata. We expect, for instance, a low rate of preservation of Late Roman deposits and structural remains in the subsurface portion of the sites discovered in the Umag area because of the very strong impact of agricultural activities that probably in many cases spared only the deeper parts of wall foundations, as on many other similar sites in Istria. A further issue, dealt with in the formation processes chapter, is the relative nature of the representativity. As the landscape itself has differing paces of geological evolution in terms of erosion and deposition of sediment on differing niches, apparently a single, unique palimpsest upon which the only action was inscription of new cultural features is a simplification when considered in the long term. In areas with more dynamic geological processes, landscapes can become stratified over large areas in the time span that is of interest for a particular research project, and therefore the surface archaeological record can be representative only in relation to specific questions that define more precisely the time span and topographical coverage (see Ch. 4.1).

The surface-subsurface relationship will, therefore, always be an uneasy one. If a surface scatter is considered to be representative of a site (at least in the composition of artefact assemblage), then the buried part of the site has either been severely destroyed, or most of it has never been covered by a substantial amount of sediment. In any case the correlation will typically rely on structures and features

that have been filled in or buried and therefore represent a specific portion of the site that cannot be directly compared to the surface assemblage (e.g. wall foundations, pits, ditches, sunken floors etc.). What might be a more fruitful approach is to stress the complementarity of surface and subsurface remains and attempt to combine the two methodologies. Surface collection can be improved enormously if accompanied by a systematic excavation plan that will reveal local pottery typological sequences and clarify individual site biographies. A good example is the work of C. Raynaud and his team in southern France. The researchers have excavated a number of "small sites", represented on the surface by small and poor artefact scatters (Raynaud 1989, 68). On the other hand, excavation methods might benefit too, as the application of methodologies of urban excavation, *sensu* E. Harris (1989), with their reliance on elaborate stratigraphic sequences, have proven to be problematic on "ploughsoil" sites (Clark 1992). Rather than stripping the ploughsoil by machines, a tradition of urban archaeology that is commonly applied on most rescue excavations, it is far more revealing to start with collecting the material contained within it. A good example is the excavation of the deserted medieval village of Hillam Burchard in West Yorkshire, which was preceded by manual excavation of topsoil. Three quarters of recovered finds came from the topsoil, and based on an examination of joining sherds it has been established that relatively little lateral movement had occurred in spite of lapsed time (Slowikowski 1995, 17).

It is not constructive to continue widening the surface vs. subsurface dichotomy. The basic methodological principles for research of both remain the same, while the differences are primarily in the formation processes and research organisation. The idea of gridded surface survey as a means of collecting data that forms the essential part of the technique of surface artefact survey comes from standard excavation methodology. Today, when field survey has "come of age", it seems more productive to stress the need for better integration of different research approaches, especially in the planning of rescue projects. After all, buried stratigraphic record is often to a large part comprised of superimposed ancient topsoil layers (Arnoldus-Huyzenveld 1995, 46). Therefore we consider the topsoil as a specific aspect of a unique depositional archaeological record that can be studied using the same basic methodological principles above and below ground, as for instance in the analysis of spatial and depositional context of small finds that is discussed in Ch 4.4.[9]

[9] A. Arnoldus-Huyzenfeld and G. Maetzke define the surface environement as: "environment close to earth's surface in which cultural objects and their relations generally stay during period between their abandoning from the 'living' socio-cultural system, and their entrance in the fossilized earth layers" (Arnoldus-Huyzenveld 1995, 38). This is clearly a perspective of an excavator interested in the buried layers, but more importantly it points to the close relationship between the sub-surface and surface record. This environment is at the same time influenced by reversed processes, (i.e. those of the reappearance of cultural objects and their relationships on the surface), sometimes in multiple cycles of burial and emergence.

3.3 The concept of site in the field survey

In the beginning, field survey was all about finding informative archaeological sites. Today it can be said that systematic survey is anything but locating "good" sites. The very concept of "site" has proven to be problematic from both theoretical and practical points of view. It is not difficult to imagine the large variety of activities that used to take place outside the settlement area, leaving behind, in some cases, material traces that can be documented by archaeologists. Hunter-gatherer societies, operating throughout the landscape in complex seasonal patterns, are an excellent example. In fact, it is in the context of the study of the mobile cultures of the Palaeolithic that the non-site methodology of field survey has been initially developed (Foley 1981; Thomas 1975). Many artefacts have been discarded on specific "locations" where only ephemeral tasks had been performed, such as the killing and butchering of an animal, overnight camping etc. (David and Kramer 2001, 234). R. Foley estimated that a mobile band of 25-30 people could produce more than 100,000 tools in a year, most of which were discarded off-site (Chapman 2000, 553).

The same applies to more sedentary cultures: much, if not most of the time, is spent outside the settlement area in pursuit of activities that may also have left some physical trace in the landscape (Bintliff, Gaffney and Slapšak 1989, 42). Adoption of intensive field survey techniques since the 1970s has revealed vast quantities of artefacts scattered through the landscape of agricultural societies that cannot emerge solely from unrecognised or destroyed sites. In this respect a fundamental methodological problem emerges – can we rely on archaeological sites that have to be sorted out from a continuous carpet of artefacts by applying some criteria that are necessarily arbitrary?

Much ink has been spilled on the issue of site definition. Some have attempted a statistical approach, applying mathematic formulas for extraction of site densities from off-site scatter (e.g. Gallant 1986; Millet 1991, 20; Cambi and Terrenato 1994, 168-169). However, it should be pointed out that the choice of a threshold and statistical method (average, quartiles, etc) are based on the particularities of surface record and the judgements and expectations of the researcher (Bintliff 2000, 206). For instance, J. Bintliff points to a problem in the methodology of the Neothermal Dalmatia Project, where the threshold for the Bronze Age sites turned out to be higher than for Roman sites, which is quite improbable (*ibid.*). The problem is that field survey teams normally operate with scatters comprised of a handful of badly preserved potsherds and in the context of site-organised methodology nothing but a simple verdict can be written down: site or non-site, along with few rough remarks regarding size and dating. It is illusory to attempt to determine fixed criteria for the point at which a scatter of surface artefacts should be labelled

(and recorded) as an archaeological site. The decision has to depend on the overall off-site densities and formation processes, as well as on the purpose and theoretical background of the survey.

There is also one other, purely technical problem regularly encountered in the course of fieldwork. In some sectors of the Umag survey were found sites that were damaged to such a degree that made them almost unrecognisable in the field. Some were identified only later, during data processing (see Ch. 7). This applies in the first place to single pieces of prehistoric pottery and fired clay that appear to be spatially correlated only when plotted on a map. We have also come across several Roman sites destroyed to such a degree that standard procedure for site recording was judged useless. Therefore survey methodology has to provide for situations in which the encountered remains fall neither into site, nor non-site category simply because of conditions of their preservation.

Finally, the site is also an issue in applied methodology. As Cherry has demonstrated by the comparative study of several Mediterranean field surveys, the density of recorded sites is strongly correlated to the intensity of field survey (Figure 10). The more time spent in the field, the more sites will be recovered. Many sites, especially prehistoric and early medieval ones, are badly preserved and of minuscule size: 10, 5 or even 2 metres in diameter, which means that very intense field techniques are required (5 or less metres between fieldwalkers) (Bintliff 2000, 203). Such intensification has a further effect on the variance of types of sites recovered, because small sites rise in abundance (van Leusen 2002, 4-13). Therefore, in order to render any particular methodology effective, the site has to be redefined and adjusted to the dataset gathered.

It is curious that the problem of the definition of the site did not arise in relation to aerial photography which at an early date revealed a variety of anthropic landscape features. The reason might be that from the air the complexity of many forms of landscape features, as well as of occupational or any other kind of sites, becomes immediately apparent. Human activity across the landscape can be readily acknowledged and many of the features can be interpreted with regard to their original function, unlike the scatters discovered in typical ploughsoil surveys. Nor is the exact definition of the archaeological site of much concern to the practitioners of excavation – a site can be anything worth excavating at a given moment. It is a technical term denoting a place during, or in prospect of, excavation (or some other research technique), even if it is unknown how and where to delimit the area that should be excluded from research (Roskams 2002, 33). From this perspective the intensive discussion of the site issue in the context of field survey becomes even more unusual. Are we setting up a straw man?

In sum, the archaeological site is essentially a contemporary phenomenon that cannot be *a priori* related to past reality. R. C. Dunell considers the issue as a duality of the site concept that is on the one

hand synthetic, created by the archaeologist for some practical purpose, but at the same time generally considered as an empirical unit representing past reality to some degree (Dunnell 1992, 29). These epistemological issues are quite far-reaching, and since they could be applied to archaeology in general (distinguishing between *emic* and *etic* etc.) we will abandon the discussion at this point. In any case, field survey practitioners have at an early date started to voice discontent with site-based methodology. The roots of the debate actually lie in the critique of settlement and cultural-historical approaches by the New Archeology (cf. Dunnell 1992, 24; Novaković 2003, 99-109). The emergence of off-site assemblages that are widely recovered in intensive field surveys has finally led some archaeologists to seriously reconsider or even reject the archaeological site as a useful concept (Gaffney and Tingle 1985, 68; Kuna 2000, 11). Some have pushed this to the limit, stating that the site is "simply an archaeological construct", and that "many early works attempted to force survey data into preconceived perceptions of sedentary habitation sites" (Bowden *et al*. 1991, 108). Some surveys started to adopt so-called siteless, i.e. artefact-based strategies.

However, the artefact level survey is an extremely demanding undertaking in terms of the rich Mediterranean surface record, at least when considering an informative spatial coverage (see Ch. 5.4.3.). It also seems impossible to record information such as soil colour, gentle topographical variations, or discrete groupings of artefacts for the entire survey area without choosing discrete segments of the landscape for such a level of recording. At the same time, the off-site artefacts are, by definition, understood only in terms of its relationship with the on-site assemblage. And finally, even in the case of the siteless survey the research results have to be sooner or later mapped as sites in the landscape, at least when dealing with typical Mediterranean surveys (Fentress 2000, 50). Therefore we are condemned to force our data into some conceptual framework. This situation becomes clear by taking a look at various odd strategies taken by survey teams in order to avoid usage of the site in survey method.[10]

In order to avoid the rather banal conclusion that the site is necessary for purely practical reasons, i.e. for designation of areas for more detailed research, we would like to point to the necessity of a more nuanced approach. First of all, the surface scatter is only a constituent of a more complex set of archaeological remains. In the Umag survey we have attempted to differentiate the description of landscape features (scatters, boundaries etc.) from those of the sites proper. In reality this did not bring a major change in recording practices, but it helped to structure the field record in more consistent manner.

[10] "Methodologically, our field strategy evolved to incorporate the concept of POSIs (Places of Special Interest) and SIAs (Special Interest Areas)" (Knapp and Given 2003, s.v. 'Sites' and 'Siteless Survey'). In the Ager Taraconensis survey, the "Abnormal Density Above Background Scatter" (ADABS) was used (Millet 1991, 23: as quoted in Mattingly 2000, 6)

Different features like find scatters, bands of cobble, or field boundaries could be recorded independently and systematically, while – and this seems to be a crucial step – enabling the recording of the differing or even contrasting interpretations by which each of the features was chosen for detailed recording. For instance, a scatter of Roman material may be placed next to or over a cobbled path of an unknown date. However, both can be at the same time recorded as a set of features which do not have to share any clear relationship. The site can be an elastic term which groups landscape features according to criteria chosen for a specific purpose.

It is also important to develop a more detailed typology of the site category prior to and during the survey. This can enable a more elastic approach to the elusive group of “small sites” that may not differ much form the off-site proper except in the state of preservation. Our experience from the Umag survey indicates that such an approach is more convenient for the complexity, or rather the ambiguity, encountered. In fact, the off-site distributions can also be condensed in discrete locations, as shown in the Maddle Farm Project (Gaffney and Tingle 1985), and in many cases their appearance as a continuous, smeared scatter may be a product of formation processes, especially in intensely cultivated areas, rather than a reflection of past cultural practices.

4. FORMATION PROCESSES

The surface of the soil layer ("pedosfere") is a highly dynamic and unstable environment, usually much more than buried strata recovered by excavation. Therefore, the amount and quality of potentially usable information is generally low, and accounting for the manifold distortions of the original (depositional) situation is a necessity. Because formation processes pose major obstacles in making reliable inferences about past human behaviour, and thus seriously weaken any higher level conclusion, the processual school has put a lot of effort into studying these processes in order to trace them to as close to the original deposition situation as possible. An optimistic (positivist) stance has characterised much of the work done by M. B. Schiffer and other researchers in the US, and has fuelled extensive experimental research regarding postdepositonal processes (Schiffer 1983, 677). According to Schiffer's framework, formation processes can be studied at three basic levels – those of the individual artefact, the relationships between artefacts ("the complex properties of the artefacts"), and the composition and other properties of the sediment matrix, i.e. the archaeological deposit (Schiffer 1983).

Terms "formation processes" and "taphonomy" (e.g. landscape taphonomy) are ubiquitous in archaeological writings, but cover overlapping concepts and may cause some confusion. Taphonomy was originally introduced in the context of palaeontological studies, first as a discipline dealing with the natural processes of incorporating animal remains into sediment, but has afterwards been widened to include all organic remains as well (Lyman 2010, 3). Therefore, it represents a part of formation processes that create the archaeological record, which is comprised of both organic and non-organic material and formed by both anthropically and naturally induced transformations. At the same time, the questions put forward differ in some crucial points between the natural sciences and archaeology (*idem*, 12). Archaeologists, however, have taken a relaxed view about the term and sometimes use it more generally for denoting the natural segment of formation processes, sometimes broadening the scope to cultural material as well. Burger *et al.* refer to their concern with natural formation processes specifically as the *landscape taphonomy perspective* (Burger, Todd and Burnett 2008, 204). Since spatial and other patterns of surface artefacts reflect discard and other cultural practices as well (see Ch. 4.4), introducing a range of issues unrelated to natural environment studies, we shall adhere to arguments of R. L. Lyman and yield the term to zooarchaeology and palaeontology.

The distinction between transformation and formation processes is also problematic when comparing archaeology with the geosciences. The latter make a precise distinction between formation processes that

modify the external aspect of sedimented layers or lithology, principally in erosion-accumulation cycles, and those that transform the strata without modifying its form, in the first place through the evolution of pedosphere (Arnoldus-Huyzenveld 1995, 30-31). For Schiffer, who elaborated the concept of site formation processes in the 1970s, transformation is a more general term denoting any change of archaeological record, having at the same time theoretical connotations as the "transformational position (perspective)" on the inference of past human behaviour (Schiffer 1983, 677). It is his concepts of two basic categories of formation processes, N- (natural) and C- (cultural) transforms, that is widely used in archaeology and will be followed here even though in landscape studies it is more apparent than anywhere that these two can never be completely shared. Geomorphological terminology can be incorporated into this scheme, for instance when dealing with topsoil *transformations* in the ploughsoil zone, or the *formation* of distinct landscape features (riverbeds, colluvial fills etc.).

4.1 Natural formation processes

The most common natural formation processes are sediment erosion and subsequent deposition. Basically, two types can be distinguished: slope erosion accompanied with colluvial deposition and long distance transport by water with alluvial deposition (French 2003, 22). Naturally, these are more often than not parts of long-term sequences of sediment formation and displacement, for instance in the case of colluvial fill originating from an ancient fluvial deposit. A useful and simple approach to the assessment of the risk of erosion/deposition processes is to consider varying energy levels of earth formation processes throughout the landscape. The energy is generally gravitational and is mostly transmitted by water (in arid environments by the wind as well), while in a high-energy setting, i.e. on a steep slope, sediment can be directly affected (Arnoldus-Huyzenveld 1995, 35). From this perspective the relief, along with fluvial systems, can be considered as the starting point for developing landscape classifications according to potential energy levels (e.g. summit of a hill, backslope, footslope, alluvial plain etc.: Arnoldus-Huyzenveld 1995, 49). In the case of evaluating the potential for the preservation of the surface archaeological record, quiet, low-energy areas of the landscape are predictably the most interesting, i.e. those that have witnessed neither considerable erosion, nor accumulation events. This is a generalisation, naturally, and it should be noted that many other factors influence the overall potential for sediment stability (soil structure, climate, vegetation etc.). Furthermore, the archaeological potential can be assessed only in relation to specific questions. For instance, ancient road sections are more likely to stay preserved on slopes that otherwise belong to the category of erosion-prone environments, since water drainage is crucial for their maintenance while their compacted structure may be more stable than the surrounding terrain.

Figure 3 Marine erosion and transformation of archaeological sites in the coastal environment of western Bujština: a) selective erosion of sediment from an archaeological layer (pit infill) contained in compact terra rossa (Dajla); b) emergence of mortared structure from the beach profile due to somewhat slower rate of erosion (Daja); c) concentration of rocks on the soil surface which is still in the process of erosion (a speck of plastered floor and a wall are visible to the left of the ranging rod) (Sipar)

Transformation processes (in the geomorphological sense) that are of special interest for landscape archaeology are those that take place within, or in relation with, the pedosphere, a very dynamic and biologically active topsoil layer. In reality, many transformational processes also feature some structure change, rendering the difference from the formational ones a gradual continuum (Arnoldus-Huyzenveld 1995, 35). Therefore, the effects upon the archaeological remains include those that appear in the high-energy environments discussed above (sorting, abrasion etc.).

The typical use of geomorphology in field surveys is in evaluating the "reliability" of surface deposits in terms of the date of their deposition and subsequent stability, although geomorphological studies have been developed into a discipline able to produce its own historical narrative (see next chapter). The importance of so-called "geomorphological windows" that offer a patches of non-disturbed past topsoil has been pointed out many times in the context of field survey organisation and result evaluation (Cambi and Terrenato 1994, 155). For instance, J. Chapman has criticised Š. Batović's traditional topographic survey of the Adriatic islands of Northern Dalmatia for not taking into account massive erosion processes. These have probably either erased or covered many prehistoric sites with colluvium, rendering Batović's inferences on site densities inaccurate (Chapman 1989, 17).

An important point of convergence in the interests of soil scientists and archaeologists is the "historical nature of soil-landscape relationships" (Arnoldus-Huyzenveld 1995, 51, according to W. J. Vreeken 1973). The rates of change vary throughout the landscape, creating different sedimentation histories, which is a crucial factor in soil evolution. In this case, soil maps present invaluable information for archaeologists, since the genetic, historical aspect can normally be inferred from the presented data, although not with the degree of precision required for typical analytical purposes. Field survey projects are often faced with problems of the historical complexity of landscape. A simple example is 20 cm or thicker layer which covers the Assendelft polders in the Netherlands (Brandt 1986). However, when the sediment accumulation follows a regular regime on a broad scale, as for instance in fluvial plains, the entire landscape will keep on stratifying during or between episodes of human occupation. A transparent surface of one period is at the same time a seal to the older one, buried much deeper (Berger 2003, 63). Therefore, the idea of geomorphological windows has its limits (even if it has proven to be extremely useful in the development of field survey methodology), and one should always attempt to view the formation of the landscape more holistically.

Looking at the particle level, important traces of erosion/deposition events are abrasion and sorting of sediment particles. Water flow, depending on the strength and size of sediment particles, usually produces effect of differential displacement, i.e. higher displacement distances of lighter particles producing an effect of sorting by size. For instance it can be expected that artefacts from a hillslope site will display a sorted pattern after a certain amount of exposition to gradual erosion (Figure 4). Strong erosion may erase the entire site in a single event and eventually redeposit sorted material in colluviums. Abrasion is a trace of a long period of transport, and is easy to recognise by the roundedness of the edges of artefacts (Schiffer 1983, 683).

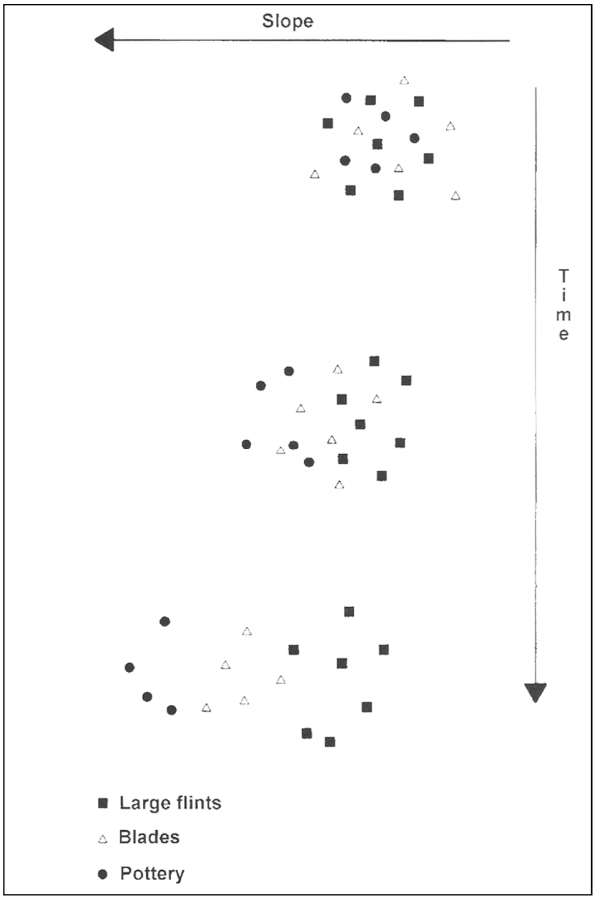


Figure 4 Sorting effect of gradual erosion (Terrenato 2004, fig 4.5, according to Allen 1991)

An exhaustive list of other formation process can be found in the seminal work of M. B. Schiffer (1996) (animal burrowing, vegetation, erosion by wind or sea, annual freeze-thaw cycles, etc.), together with numerous clues through which these processes may be identified during fieldwork and finds analysis. And finally, for the sake of its uniqueness, let us mention one more disturbing agent, the ant. This curious insect (more precisely: harvester ant, *Pogonomyrmex occidentalis*) has been studied in the US where it has been demonstrated that in pursuit of the construction material it is capable of clearing the area of at least 5 meters in the radius around the ant mound. This way many small artefacts would eventually end on ant mounds. The usual collecting radius is probably around 12 meters (Burger, Todd and Burnett 2008). Even if the harvester ant does not exist in Europe, this case is a good example of the enormous complexity of natural processes that influence the formation of the landscape.

4.2 Cultural formation processes

There are certain issues regarding the definition of C-transforms or cultural formation processes as developed by Schiffer and the behavioural school. These activities, according to the original definition that includes discard practices, re-use of objects, reclamation and post-depositional disturbance, in fact cover a broad range of patterns that can be in many instances considered as cultural practice rather than distortion of the archaeological record (Lucas 2001, 148-150). Here, we shall treat artefact discard separately. Perhaps only the post-depositional disturbance may correspond to a strict definition of formation processes, i.e. activities that distort the archaeological record more than they create it. However, in landscape studies this idea is also problematic if regarded only in one direction, in retrospect. What is disturbance of one period, for instance stone clearance, is at the same time a cultural intervention in the landscape, a link in a millennia-old chain of agricultural activities. Overall, the strict distinction between the systemic, living context and cultural transformation can today be said to be superseded (Lucas 2001, 150), but the concept in general is surely at the core of archaeological methodology.

Different formation processes documented in the Umag survey will be discussed in the second part of this thesis, and there is no need to embark on a long list such as the one provided by Schiffer (1996). We shall mention only a few details that may be of some importance in the context of the Umag survey.

The practice of field clearance, very common in the Mediterranean, has a strong effect on surface scatters. During the Hvar survey, up to 50% of finds were found on stone cairns and boundary walls, indicating a long term practice (Bintliff, Gaffney and Slapšak 1989, 50). Small objects do not affect agriculture and they are more likely to be found in the field, while larger stones and artefact such as pieces of amphorae and tegulae will be tossed aside and often incorporated into the stone walls (*ibid.*).

In the Mediterranean zone, where good agricultural soil is often lacking, the practice of excavation of fertile soils for gardening purposes can introduce serious errors in field survey. The problem resides in the fact that it is precisely the dark, organic layers from archaeological sites, rich in nutrients and of fine texture, that attract the activity. This practice has been recorded at several hillfort sites in Istria (Buršić-Matijašić 2007, 254, 255), as well as in caves in the Istrian villages of Slum and Dani (Komšo 2003, 46). It is quite likely that sediment from Pupićina cave (Istria) had been mined already in the later prehistory (Bronze-Iron Age) (*ibid.*). This practice is reminiscent of *Sebakh*, the soil that is taken from tell sites in the Near East for fertilising the surrounding fields (Given 2004, 17). A similar agricultural practice, albeit much less destructive, has been reported in West Africa, where old house sites are regularly farmed because of their exceptional fertility (David and Kramer 2001, 96).

An important issue in Mediterranean landscape studies is the history of erosion episodes (and colluvial deposition), which has been shown to have a close link with agricultural techniques, especially terracing on slopes. The model of C. Vita-Finzi that suggested a close link between the period of erosion and relapse in social structure has been much refined subsequently, but the basic principle, the connection between the abandonment of the elaborate terrace system and strong erosion outbreaks, still remains generally acceptable (Roberts 1998, 189, 191). However, there are many other factors influencing erosion outbreaks, and simplistic relating of the "Younger Fill" with post-Roman (or any other) crisis, as in Vita-Finzi's original model, has been much criticised (*ibid.*; van Andel and Runnels 1987, 137). The work of C. Runnels and T. Van Andel in southern Argolid has demonstrated a history of successive periods of longer term soil stability, interrupted with brief but often very pronounced erosion episodes. Such an event has also been identified on recent aerial photographs taken within a period of less than thirty years (van Andel and Runnels 1987, 148). The authors propose a more detailed scenario of land use that spurs periodic soil washdowns. The most dangerous situation is not a complete abandonment of agriculture at a given area, which is likely to result in fast overgrowth with protective vegetation, but rather a decrease of activities with the neglect of terrace maintenance, for instance a shift to husbandry.

As can be seen from the more recent work, the study of soil and sediment formation processes of the last three or four millennia has advanced a great deal toward a discipline able to generate its own historical narrative. Beyond typical issues of long-term planning and risk management in the unstable Mediterranean environment – a perspective labelled "colonial" by Butzer (2005, 1775), as it usually stresses the need for superior management strategies – much more can be said about the intricate interrelationship between man and environment. Erosion may have had a different impact on past communities, especially those which employed more flexible or mobile subsistence strategies and thus better adapted to localised environment changes (Walsh 2004). On the other hand, "good management" techniques – documented, for instance, for the Roman period – may be such only in the short term, depending on a highly structured social system (e.g. slave work), and are bound to cause much damage in the long term (Walsh 2004, 241). These notions do concern field survey as they provide an invaluable perspective on landscape history and can stimulate specific geoarchaeological research goals rather than providing simple evaluation maps indicating zones of greater or lesser disturbance.

4.3 Ploughsoil

Ploughsoil is a typical environment for European surveys, while in warmer areas like the southwestern US, Mesopotamia, or Africa surveys are regularly done on untilled terrain as well, because of good surface visibility in arid or semiarid environments. The effect of soil tillage, especially in modern

mechanized agriculture, is the destruction of subsurface archaeological remains, their amalgamation and turning to the surface. The impact can be so strong that sites become periodically invisible (Barker's comment that "Roman tile scatters come on and off like traffic lights" is often quoted (Bintliff 2000, 201). However, experience has shown that the position of surface scatters does not change significantly and that localisation of archaeological sites by surface scatters can be considered reliable in a typical agricultural environment (Ferdière 1998, 10; Slowikowski 1995).

Taylor (2000) considers ploughing, subsoiling and land drainage as the three most important agricultural activities, while subsequent tillage by harrowing and disking affect the remains that have already entered the ploughsoil layer. The depth of ploughing depends on the type of soil: usually the heavier soil requires deeper tillage, but the typical depth averages 30 to 40 cm (*ibid.*). In the Umag area deep ploughing has been popular for some time, reaching approximately one meter in depth (we have no precise data) and performed by a bulldozer (Ch. 6.7).

The formation of ploughsoil is considered to be a radical process of homogenisation of the topsoil layer, at least after several cycles. On the drawing presented by Taylour discrete, regular chunks of soil are presented lying on a fairly smooth surface (Figure 5). However, occasionally, upon excavation, a layer of smeared, disturbed archaeological sediment that is still related to the preserved stratigraphy can be observed. As an illustration we present a small test trench on an Iron Age site in the Sisak region (Figure 6). The soil matrix is composed of characteristic, very fine, red sand, probably of eolic origin, which does not require deeper tillage. The ploughsoil can be divided into the top layer, c. 20 cm deep, and the underlying, darker layer 10 cm or less thick. The distinction between the two is rather difficult to make and this may account for the somewhat erratic interface. The lower layer has been found to contain better-preserved pottery fragments and some stone in a heterogeneous matrix, apparently derived from destroyed archaeological features. The difference in the thickness between the two ploughsoil layers may be related to downward sediment displacement, which is more pronounced in the surface layer (000). The next layer is still damaged by ploughing, but can be delineated in plan quite clearly as lateral displacement has not been considerable, and thus lends itself to standard stratigraphic excavation (002, 005a). The ploughsoil, therefore, is progressively homogenised, from top to bottom. This observation, perhaps, does not have a direct relation with the surface collection, but it may furnish ideas on topsoil sampling as the conditions of preservation can be expected to be a function of depth.

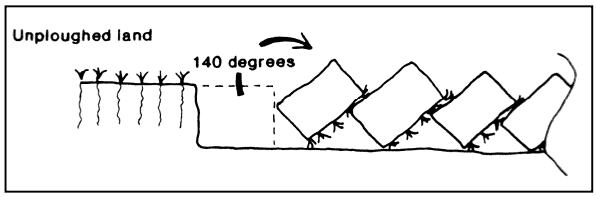
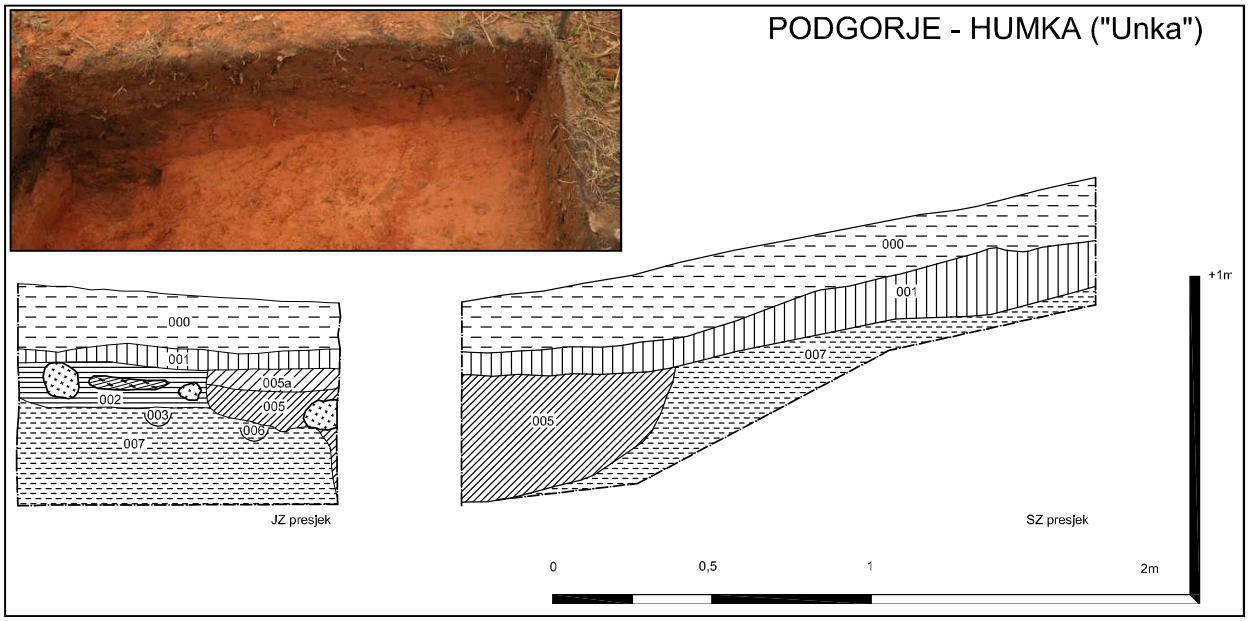


Figure 5 Plughsoil formation (Taylor 2000, 17, fig 3.1)



000: ploughsoil- upper part

001: ploughsoil- lower part

002: cultural layer (infill)

003: negative of a structure

005-005a: infill (a pit)

006: negative of the pit

007: steril layer (sand)

inclusions: charcoal (striped), burnt clay (crosses)

Figure 6 Test trench on a ploughed field in Podgorje (Gvozd, Karlovac region)

The most common surface tillage techniques are harking and disking, which do not influence the composition of the deposit, but do make a certain impact on the condition of the surface and the distribution of artefacts. The impact that these activities have on the visibility of surface artefacts is very strong because by crushing lumps of soil smaller pieces of stone or pottery emerge to surface. Since it may be that these smaller objects, like bits of terra sigillata or flaked stone tools, furnish significantly different information than bigger sherds of tegulae or amphorae, it can be argued that it is not possible to compare directly the distributions produced by ploughing and those that emerged after harking. We prefer to consider agricultural activities subsequent to ploughing as “visibility enhancement” rather than just

"disturbance generators" as the former effect has a much more pronounced influence on the results of field survey than the latter. This is discussed in the next part of the thesis, on the basis of our experience in the Umag survey (Ch. 7.1.). There we have learned that in order to make the best use of surface conditions, whose impact on the recovery rate of the survey is very important, a synchronisation with seasonal tillage is necessary. Most of the survey teams from the temperate zone would report a similar experience (e.g. Fasham 1986, 21). However, since the Mediterranean surveys are typically done in the dead season, under blazing summer sun, this issue has remained forgotten in spite of tremendous efforts in accounting for multiple visibility biases of survey methodology.

A number of experiments dealing with postdepositional formation of surface assemblage has been made. The typical question is the relation between the initial population of artefacts deposited prior to cultivation and the surface population in terms of location, frequency, and composition. A. De Guio quotes a dozen or more experimental studies that have dealt with the relationship between the parent topsoil population and the surface densities. Figures vary widely, from 0,3% to 16% of the original population collected on the surface after tillage. The differences are in part the result of methodologies applied and many other local conditions, but still a clustering between 2% and 6% is noticeable (De Guio 1995, 346). Further effects of soil cultivation include sorting by size and differential displacement. A. De Guio also quotes the results of Lewarck and O'Brian, who have demonstrated that larger artefacts (particles) tend to have higher displacement distances, and also that the finds collection overrepresented bigger artefacts when compared with initial population. Smaller artefacts seem to have a more consistent recovery rate than larger ones (*idem*, 343).

4.4 Artefact discard

As already discussed (Ch 3.2), topsoil assemblages can be seen as a specific part of the archaeological record rather than a distorted mirror of the underlying stratigraphy. Generally, three basic material categories can be recognised in this record: small (portable) finds, built or naturally shaped structures, and sediment deposits together with their interfaces. Studying their relationships can be a good departure point for developing elaborate methodological concepts, like S. Roskams's (1992) ideas about improveming the old notion of find status. One of the basic tasks of post-excavation analysis is to sort out finds recorded in the original "primary" position regarding the deposit or structure that encapsulated them from those found in the disturbed and detached "secondary" position, and therefore not very reliable for dating or other assessment. The status, however, is not only the issue of postdepositional history of deposit disturbances, but also of the functional relationship between the layer and the artefacts that it contains. Roskams has proposed four status categories based on this relationship (Roskams 1992, 28-29):

Type A: finds are contemporary with, and functionally connected to, the stratigraphic unit from which they were derived. (e.g. iron slag in the bowl of a furnace)

Type B: finds broadly contemporary with, yet functionally and perhaps spatially distant form, the context in which they were found. (e.g. the iron slag spread outside building containing the furnace)

Type C: finds chronologically and functionally unrelated to the context in which they were found, but derived locally. (e.g. Roman pottery in a medieval pit derived from earlier layers on the same site)

Type D: finds functionally unrelated to the context in which they were found, imported to the place of deposition and earlier in date than the context. (e.g. early medieval boat timbers incorporated into late medieval building)

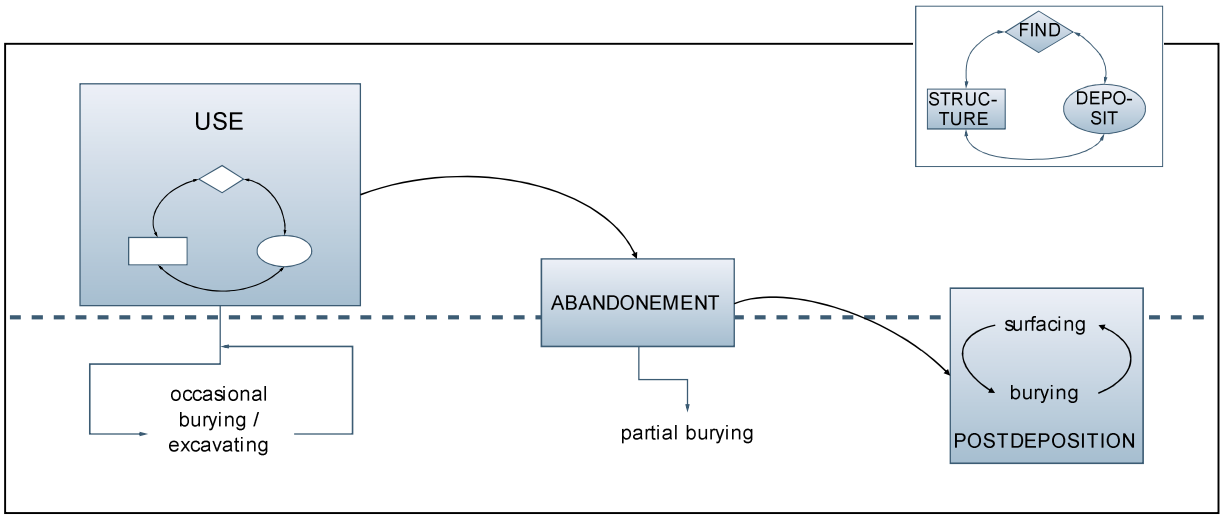


Figure 7 Diagram of the common formation biography of an archaeological site.

It should be pointed out that the definition of finds status is shifted from the directly obvious, chronological contexts to spatial ones, and then to functional ones. Each shift provides more refined interpretative possibilities. The relationship between basic material constituents of a typical archaeological site, archaeological layers, traces of structures, and small finds (artefacts, ecofacts, etc.), can be translated into the relationship between actions of construction, accumulation and discard. By extending the scheme with processes of abandonment and postdepositional transformations, a solid framework for describing a site history in terms of its formation processes can be provided (Figure 7).

The A and B categories of Roskams's sheme resemble the frequently used concept of primary/secondary refuse as defined by M. B. Schiffer. The relationship of size and status (the smaller the more likely to be primary (Schiffer 1983, 679: 'The Mc Kellar hypothesis') has been recorded on many excavations and field surveys. On the lakeside Neolithic site Fimon Molino Casarotto in Italy, this effect was visible in the distribution of artefact fragments which conformed well to the model of maintenance activities that concentrated archaeological finds outside the dwelling area, especially those of larger size (Fontana and Bagolan 1992). A similar conclusion has been reached in the Hvar survey, where considerable attention had been paid to postdepositional processes. The site of villa Ježe was intensively surveyed, augered and sondaged by a $50m^2$ trench. The work revealed significant discrepancy between the distribution of pottery and traces of ancient construction that were deduced by scatters of plaster and tesserae (Bintliff, Gaffney and Slapšak 1989, 51).

Status	Use/Abandonement	Postdeposition processes	Discard
A	"Pompeian" event, abrupt abandonment	Fast soil accumulation, low postdepositional disturbance	"Primary refuse", in situ structures, exceptionally large artefacts (e.g. dolia)
B	Abandonment after steady, unchanged use Rubbish disposal, small repairs and maintenance	Typical slow postdepositional disturbance; ploughing, low level of erosion or accumulation, limited spatial movement	"Secondary refuse", maintenance activities (e.g. spreading pottery in the courtyard)
C	Abandonement after long time of use, restructuring, change of function Localised soil excavation and dumping, limited recycling	Pronounced disturbance (erosion/accumulation), stone robbing, strong agricultural impact	Locally recycled material (stone, brick, tegulae, imbrices),
D	Off-site disposal (manuring, road maintenance…), Recycling	Erosion, or other strong disturbance	Off-site finds, transported recycled material

Table 1 Relationship between formation processes and finds status (in each row are noted minimal requirements for the recovery of a particular status category).

Regarding the formation of surface assemblages, some specific issues of artefact discard and site formation have to be further considered. As already noted by Haselgrove (1985, 16: as quoted in Taylor 2000, 17), most of the activities and artefact discard on archaeological sites occurred on past surfaces, and these are normally incorporated into ploughsoil (otherwise sites would not be visible) (Figure 8). Therefore it has to be acknowledged that surface artefacts represent a specific portion of the site and should not be expected to directly reflect the buried structures (pits, ditches etc.) that have been spared the destruction. In fact the two assemblages may be complementary, offering information from different contexts, thus further complicating the issue of the direct comparability of the surface and subsurface.

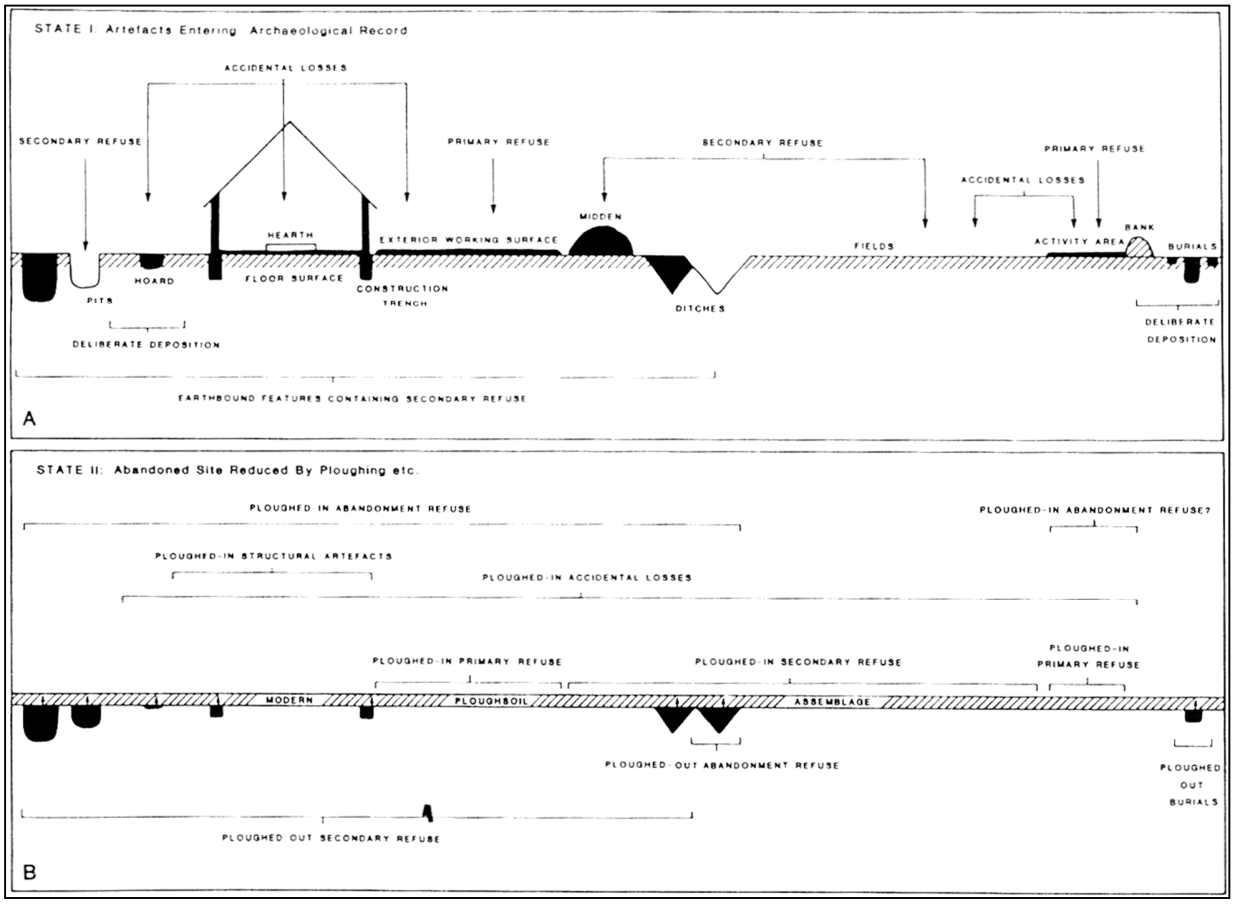


Figure 8 Formation of a ploughsoil assemblage (B) from a hypothetical settlement site (A) (Taylor 2000, 18, fig 3.2, as reproduced in Haselgrove 1985, fig 1.3)

4.4.1 Pottery supply

An important concept that has emerged in Mediterranean studies is the consideration of regional and temporal variations in the supply of pottery. Most of the surveys in this area are faced with an exaggerated predominace of mass-produced ware from a certain period. As a rule, this period is related to economical prosperity – Early Roman in Istria and much of the western Mediterranean, or Classical to Helenistic in Greece – making it even more difficult to distinguish the internal dynamics of regional development from wider mercantile trends.

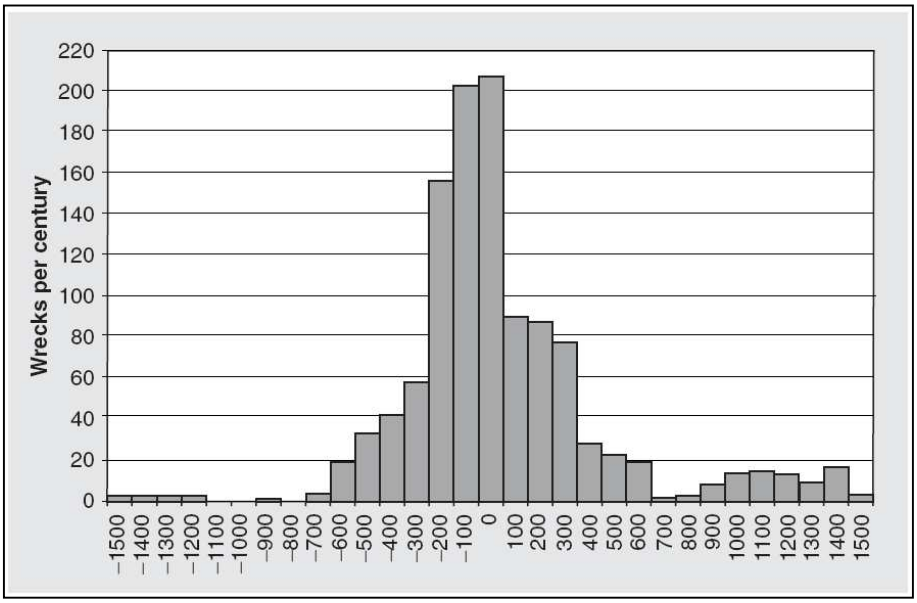


Figure 9 Number of shipwrecks in the Mediterranean per century (using probability of dating range for each wreck per annum) (Wilson 2009, 223, fig 9.3).

As the mass-produced pottery is usually chronologically sensitive and has higher variability rates because of large samples, the dynamics of its consumption and deposition can pose multiple problems for the interpretation of survey data (Millet 1991; Millet 2000, 55). For instance, Cambi and Fentress have successfully demonstrated that the apparent decrease in the number of dated sites in the Albegna survey is due to a sharp decline in the availability of some diagnostic pottery types and not a feature of regional historical trajectories. The absence of dating evidence cannot be directly related to the absence of human activities but should rather be considered in terms of wider trends (Sbonias 1999, 5). M. Milett's work regarding pottery supply patterns in Iberia (ager Tarraconensis) is frequently quoted. These patterns vary in time and space, and thus ceramic assemblages from sites have to be considered against the total

ceramic assemblage of the entire region for a given period before any comparative approach is attempted (Millet 2000).

Expertise in the local pottery sequence is also important in case of possible periods of abandonment, because in the Mediterranean this is usually the principal type of data obtained in surveys. In the Beotia survey an apparently blank phase in the dating of the surveyed countryside sites spanning Late Hellenistic and Early Roman periods could not have been assessed until a pottery sequence form larger settlement had been obtained. Only when the missing types were recorded there was it possible to confirm that the blank was a genuine one (Bintliff and Snodgrass 1988a, 70).

4.4.2 Off-site discard

Considering off-site finds, several problems emerge regarding the interpretation of their distributions. Some amount will always belong to a group of badly damaged or poorly represented sites that are too meagre for the applied method, but a large proportion had also been moved away from the site by some specific human action. The manuring hypothesis is by far the most popular for classic pottery scatters around historical settlements (e.g. Hayes 1991; Bintliff and Snodgrass 1988b). The work of T. Wilkinson on the landscapes of ancient Near Eastern urbanised communities holds a prominent place in this respect, as he demonstrated very clear and unambiguous patterns of off-site scatters that follow radial communications linking towns with their environs (Given 2004, 14; Wilkinson, Ur and Cassana 2004, 197: fig. 14.10). These scatters spread out in a radius of up to 5-6 km around tells, and about 1 km around outlying satellite settlements. Thanks to the good dating potential of small off-site finds, their spatial and temporal distributions allowed Wilkinson to tackle such issues as the rates of agricultural production, population growth, relations between local settlements etc.

In a theoretical manner the agriculturally derived off-site artefacts have been dealt with by P. P. Hayes. He suggested several general models:

- Rubbish disposal inside or in the immediate vicinity of the settled areas, as discussed above. The density of artefacts can be high and often cannot be distinguished from site densities.
- Manuring with house refuse that included some amount of broken pottery. The scatter would be thin but extensive and correspond to intensively cultivated areas close to settlement.
- Intentional burial. In this case only larger cemeteries may be expected to produce a recognisable pattern. The source of the off-site artefacts can be assessed from their characterisation (typology).
- Miscellaneous breakage.

The characteristic high-density off-site scatters can be expected in cases of developed societies with high agricultural output. Such an economy is known to have had a demand for manure which could have been sold as commodity (Hayes 1991, 83).

Off-site finds form Maddle Farm in Berkshire, England, seem to correspond well to a mixed economy model (Gaffney and Tingle 1985). At Maddle Farm several discrete concentrations of finds were recorded in the vicinity of a Roman villa. The spatial pattern has been interpreted as different functional zones: a manured area and an enclosure for livestock devoid of artefacts that may have served as a source of manure. The authors also suggest that smaller field scatters further off the villa may not be indicators of sites but of manure heaps as well (*idem*, 71).

In Mediterranean surveys only one period usually predominates in the off-site, as for instance in the Thespiae environs (Beotia), where 80% of off-site finds belongs to the Classical Greek period (Bintliff [prep.], 113). The interpretation for the latter case is typical: a surge of mass fertilisation in the context of stress on food production for the overpopulated town (*ibid.*). However, it has to be remarked that off-site discussion very rarely embarks upon the issue of ancient agriculture, other than confirming or denying the manuring hypothesis. The undeniable temporal clustering of off-site finds probably reflects certain trends in agrarian techniques, but manuring itself is an ancient practice (see Ch. 9.3.4) and a better understanding is necessary of the (dis)appearance of its traces in the surface record.

Some details on the manuring practices can be obtained from medieval sources (Puig 2003). Manure has to be prepared and aged before use and heaps of waste regularly accompanied medieval villages. Cow and sometimes horse dung is considered better than that of sheep or pigs, while different crops also have differing demands. Household refuse is also recommended as an addition. Typically, wheat and pulses benefit from regular manuring, while wine is not so demanding (*idem,* 76). Olives are probably the least demanding. Therefore, the picture is rather complex, depending on the type of agriculture, crops sown, and natural environment.

E. Fentress has taken a very sceptical stance regarding the off-site material from Mediterranean surveys in general (Fentress 2000). She argues that there are numerous possibilities for the off-site record formation, such as rubbish left after eating and drinking in fields (it is known that in historic times peasants would sleep in the fields during the peak of the agricultural season), transhumance routes, and rubbish disposal. Certainly, a good deal of off-site artefacts may emerge from small or completely destroyed sites (idem 47). This hypothesis has been favoured by J. Bintliff and M. Kuna in the case of prehistoric off-site pottery finds (Bintliff 2000, 214: note 3; Kuna 2000, 33). It is suggested that the

survival of true off-site patterns through manuring is not likely due to the low quality of ceramics and prolonged periods of abrasion.

The discussion on off-site material cannot be clarified without better field methodologies (c.f. Mattingly 2000). Clicker counting and/or grab sampling cannot be viable approach, at least if any off-site study is planned. The composition of the assemblage is crucial information, but this type of information is not regularly provided by Mediterranean surveys, even those that pay much attention to off-site recording (Mattingly 2000, 7, table 2.1). For instance, in the case of hypothesized manuring mostly domestic pottery can be expected, and the ratio of pottery versus ceramic building material is a crucial information for the assessment of off-site assemblage (Fentress 2000, 47) and here Ch. 9.3.4 and 10.5.2. Other data such as position in the landscape (Puig 2003, 75), dating, typology etc. are just as important and can be tackled with a perceptive sampling strategy or, coarsely, within standard field survey technique as in the Umag survey (Ch. 7.1). Otherwise, we cannot enter the debate on the off-site assemblages that are regarded by some as a “highly degenerated sample”, not worth of closer attention (cf. Fentress 2000, 48).

5. FIELD SURVEY METHODS AND TECHNIQUES

5.1 The soil surface

In considering the topsoil as the primary source of information in surface archaeology it is useful to make a distinction between the surface itself and the physical layer that it defines, as it is practised in archaeological excavation (Harris 1989, 63ss). The surface has some very important properties, in the first place the visibility of the topsoil, that influence choices of survey techniques and the quality of the collected data. Furthermore, surface and topsoil find assemblages may differ to a certain degree, as already discussed (Ch. 3.2, 4.4) (Slowikowski 1995, 17). Based on the relationship between the surface and the topsoil we distinguish three most commonly encountered situations: a surface that has been opened on a cut through (a) deposit(s), a reworked or transformed surface that has been made simultaneously with the topsoil deposit, and a non-transparent surface that does not allow contact with the deposits that may be of interest (c.f. Ferdière 1998, 9).

a) surface of a cut

Here we have a situation that is common to excavation: a partial removal of the deposit that has occurred much later than its formation and that has exposed the contents of already formed archaeological strata. Horizontal cuts are most common in construction lots and similar anthropic situations. Natural processes very rarely operate in horizontal manner without significant subsequent reworking.

Vertical or oblique cuts are more frequently seen in the field because they are more durable in time, and because many anthropic and natural phenomena operate in this way. When due to soil erosion these cuts are relatively durable, as they are slowly renewed by natural processes and the cut surface is slowly advancing into the deposits. After a longer period, however, significant changes, if not complete erasure, can be expected. The more the gradient (dip) of the surface is oblique, the higher is the potential for significant reworking. This applies in the first place to differential transport of material, which can result in sorting by size and shape (Figure 4). As the entire coast of Istria is sinking, dozens (or even hundreds) of Roman and prehistoric sites are currently being eroded, abraded and submerged. The extremely high

sea level in December 2008 exposed many archaeological deposits and structures like the Roman site at Dajla (Figure 3). Stratigraphic layers and their relationships may be duly recorded, but their true extent and most of the contents remain unknown. Surface study will not produce the information that is comparable to excavation, where large portions of archaeological layers are uncovered and most of the small artefacts collected.

b) Reworked surface

Transformation processes, ploughing in the first place, will in many cases leave an open surface which is very attractive for field survey. However, some natural settings may also provide a good environment for surface research. Beaches in western Istria abound with abraded pottery fragments, which are often accompanied with architectural remains emerging form eroded banks. Large parts of uncultivated Mediterranean karst that are transformed by slow erosion can also sustain interesting concentrations of archaeological artefacts with an acceptable degree of disturbance (e.g. Nakovana on the Pelješac peninsula: Forenbaher and Rajić-Šikanić 2006). Due to wind erosion, a similar effect (selective removal of smaller particles) is even more pronounced in arid climates, where it will expose extremely dense surface concentrations of artefacts (Bintliff and Snodgrass 1988b, 510, fig. 2). The effects of ploughing and other transformation processes, as well as their importance for the field survey methodology, have been dealt with in detail above (Ch. 4.3).

c) Non-transparent surface

This term refers to surfaces that do not allow for deposits that may be of interest to be seen. In the case of vegetation cover, such as a meadow or a forest, this relationship is a simple one, but it is also possible (or probable) that sediment layers of varying depth cover layers that may contain archaeological traces (Ch. 4.1).

The situation where the contents of deposits of interest cannot be seen imposes a different approach to field survey. Artefact collection can no longer be an important part of fieldwork, and the attention is turned to topographical features and structures that emerge close to the surface (Fasham 1986; Ferdière 1998). It must be carried in mind that there can often exist a significant buffer deposit between what is seen and what is expected to exist in the ground, or is supposed to have existed originally. The ditches are usually filled to a certain degree, just as tumuli are significantly lowered, etc. In some cases the topographic features can get more accentuated: for instance, the ramparts of Istrian hillforts are often enlarged by the deposition of stone cleared form arable plots inside the enclosures long after the abandonment of the settlement (Lonza 1977, 36).

5.2 Surface visibility

There are several definitions of visibility in field survey. The basic one refers to the amount of visible bare soil in the overall surface, usually expressed as a ratio (0-100% visibility), and sometimes descriptively (poor-excellent). Van Leusen considers it as a retrieval rate: "the probability that an artefact lying within a walker's transect will be recorded", which depends on multiple factors such as land use and land cover (LULC) (van Leusen 2002, 4-6).[11] Terrenato and Ammerman extend the concept to the overall recovery success of the survey (Terrenato and Ammerman 1996). Visibility in this case refers to a compound biasing factor made from a combination of ground visibility and geomorphologic coverage.

The tendency to lump multiple biasing factors together seems not only confusing but also flawed. As already discussed, some of the "biasing factors" should be dealt with separately, in terms of different formation processes which often have rather unique characteristics. Geomorphology has a very complex effect on recovery success. For instance, the uneven stratifying of larger sections of landscape will cause multiple "visibility" layers, not only "windows" (see Ch. 4.1). Accounting for these effects is a very difficult, if not impossible task; each archaeological period and each landscape unit should have its own visibility index. Furthermore, an interesting problem may occur – how can this type of visibility be dealt with in the absence, or with a small amount, of archaeological data? This question arises from an idea standing behind the "compound" visibility definition – the application of complex rectification methods in order to reconstruct original site or artefact distributions (c.f. Terrenato 2000). These, then, are meant to be analyzed by (geo)statistical methods that demand representative samples.

The simple visibility index usually refers to the amount of vegetation cover. It should not be applied to elements of the soil layer, such as larger stones that may seem to obscure the soil containing artefacts (e.g. van Leusen 2002, 4-9). These elements probably appear throughout the layer and therefore it is not possible to label as visibility the ratio of different sediment components. Descriptive visibility recording is not as suitable for quantitative analyses, but in reality may be just as accurate as the numeric one because both are usually assessed in the same way (by eye).

The relationship between recorded visibility and success in artefact recovery has remained a mysterious one (Terrenato 2000; van Leusen 2002, 4-6). Many different survey projects have attempted to quantify the visibility-recovery relationship, either by experiments such as the seeding (artificial

[11] Van Leusen also presents his visibility recording practice in the Regional Pathways to Complexity project, which comprised three surveys in central and southern Italy. Five factors were recorded: vegetation cover, stoniness, sun/shade, soil weathering, and ploughing conditions. Overall visibility was independently assesed as a sixth variable (van Leusen 2002, 4-14).

spreading) of artefacts, or by statistical analyses (Terrenato 2000), and the results indicate that the visibility is usually underestimated. For instance, the Sydney Cyprus Survey team has come to a factor of only 1,14 [12] for rectifying the recorded visibility obstruction of 50%, instead of the expected 2,0 (Given 2004, 17). One of the problems regarding surface visibility is that it also refers to a movable, two-eyed surveyor and not only to the condition of the soil surface. For instance, during the Umag Field Survey the visibility was recorded before traversing the field, and on one occasion a field covered in a type of larger, chard-like plants was estimated to have less than 50% of visible ground surface. However, by spreading large leaves and by looking from a slightly lower angle this vegetation allowed quite good visibility conditions. In this case it would be appropriate to estimate the influence of vegetation to c. 30% or less. Moreover, the surveyors naturally try to look harder in problematic areas, trying to find larger spots of bare soil surface.

One of the issues with visibility, when considered in terms of retrieval success, is that it is not only a measure of surface transparency. There are many other factors that stand between the eye and the hand, such as fatigue, experience, lighting, weather, etc. The Sydney Cyprus Survey team has tried to tackle the "background confusion", e.g. the team's weariness after a prolonged period of work, which has a similar impact on the recovery rate in field survey – even more significant than ground visibility, as they claim (Given 2004, 17). (Considering the mid-summer timing of many Mediterranean survey campaigns this may be a considerable issue, indeed.) A similar effect may be produced by the composition of surface sediment: if heterogeneous and multi-coloured, it may exhaust the surveyor more quickly and may demand longer time to become familiar with.

Finally, there is the old problem of the differential visibility of artefact types; those more conspicuous or more familiar to the surveyors have much higher chances of being observed. Bright Roman terra sigillata has a much better chance of being spotted than prehistoric or medieval coarse ware. Frequent fabrics that surveyors get accustomed to also tend to be observed more easily than occasional, rare types. Lithics is perhaps the most problematic material. J. Bintliff and A. Snodgrass have made an experiment in Beotia by inviting a lithic specialist to walk parallel to the standard field team, with the task of looking for stone implements exclusively. He found one stone tool per hectare whereas the others found nothing (Bintliff 2000, 207). Similar phenomena have been reported on other surveys, typically concerning lithics and badly preserved prehistoric pottery, which were reported only by experts or otherwise motivated surveyors (van Leusen 2002, 8-5).

[12] It does not seem to be a typographic mistake.

5.3 Strategies

5.3.1 Size of study area

Considering the methodological issues in systematic field survey, the amount of space covered is a very important decision that, as a rule, heavily influences the choice of a field technique. As has already been shown, the definition of the criteria that describe a chosen study area may vary from purely archaeological ("territory" of an archaeological group or culture, administrative territory of an ancient town, etc.) to ecological, geographical, economical, or other factors that are regarded as important. However, in the real world research is more often than not constrained or shaped by present administrative demarcations, be it for the reason of financing, or of institutional jurisdiction. Cambi and Terrenato differentiate several typical settings for the field survey (Cambi and Terrenato 1994, 84-101):

1) Administrative or other artificially delimited areas to be covered for the purposes of CRM or rescue archaeology. Here the research can be strongly influenced by non-archaeological, modern situations. For instance, efforts may be directed towards areas of urban development even if they are already severely damaged and patchy, and will not permit discerning some reliable patterning of past remains. Considering the rate of the destruction of cultural heritage on the fringes of urbanisation, or in the zones of heavy agriculture, survey projects often show themselves sensitive to protection or rescue. For instance, C. Raynaud's project in Vaunage (Languedoc) first concentrated on areas that were to be lost in the near future, and only later proceeded into more stable agricultural land (Raynaud 1989, 60).

2) A region is a large piece of land, geographically distinctive and with strong cultural identity (Cambi and Terrenato 1994, 92). The emphasis on the regional approach has been stressed by the processual school and its predecessors, and it can be said that it (still) stands at the heart of field survey methodology. It has to be kept in mind, however, that socio-economic processes operate on multiple levels, especially in large world systems like the historic Mediterranean. A good example is a survey of Beotia, a historic region of c. 3,800 km^2 (Bintliff 1985). Here several interconnected processes could be examined: local demographic trends and food production for local demands, production of supplies for a supra-regional market, and finally production for the state or province. These processes may reflect differently throughout the region and the larger the coverage of the research the more complex, long-term patterns may emerge (Bintliff 1999).

3) A subregion (*compressorio*) is defined by Cambi and Terrenato as a minimum common denominator from the point of view of spatial archaeology (Cambi and Terrenato 1994, 95). It is

an area of geomorphologic homogeneity with a strong cultural and economical identity. As an example they mention the Biferno Valley, Chianti and Dalmatia, although the latter can also be viewed as a small region. Survey of an entire region is seldom accomplished because of practical issues, so a smaller geographical unit is much more popular, especially river valleys or islands. A smaller area, however, can be difficult to understand without the knowledge of regional cultural patterns. Concentrating research on rich, lowland areas will never reveal interesting relationships, for instance, with areas of mountain pastoral economies, that may lay in close proximity (Barker 1981, 153ff, De Guio 1995, 365), and may also miss some large-scale patterns like centre-periphery systems or large trade/communication networks (Cambi and Terrenato 1994, 108).

4) Finally, for the purpose of thematically focused research (e.g. Mesolithic in the Lake District, or the development of Etruscan city states) a smaller piece of land may be chosen that is already known to contain archaeological remains that will be relevant for the study. Furthermore, a set of such small-scale, intensively covered areas can be dispersed throughout the landscape, moving away from the ideal of classic "regional" field survey. Cambi and Terrenato use term *i contesti diacronico-tematici* even though this type of survey usually has a narrow diachronic scope (Cambi and Terrenato 1994, 99). Regarding organisational issues, this approach offers significant benefits. The staff can concentrate on a well-defined problem and may require a smaller range of experts than in regional survey. The project may be more successful in dealing with a specific research theme when compared to truly diachronic regional surveys. On the other hand, this style of work is moving away from the concept of the unity of landscape in space and time, and even though field techniques deployed may not differ from those of field survey, the results may be more compatible with traditional settlement studies than large-scale landscape histories.

5.3.2 Survey intensity

The intensity of field survey is best explained as the amount of time spent on a fixed area, and regarding standard field technique (walking in parallel array) it is usually expressed as the distance between walkers. This distance has a sieving effect on the surface artefact population: the coarser the technique, the smaller the expected ratio of small or inconspicuous scatters (e.g. isolated burials or activity areas that are not larger than a few meters in diameter: Bintliff 2000, 204). The often cited comparison chart by J. Cherry (Figure 10) illustrates huge discrepancies between the results of earlier, extensive, and later, more intensive Mediterranean surveys (the scale is logarithmic!). Similar comparison of methodologically different field surveys in the Southwest US has revealed a loose linear correlation that points to a 75%

improvement in site discovery success when doubling the amount of time per unit of area (Plog 1978: as cited in van Leusen 2002, 4-12).

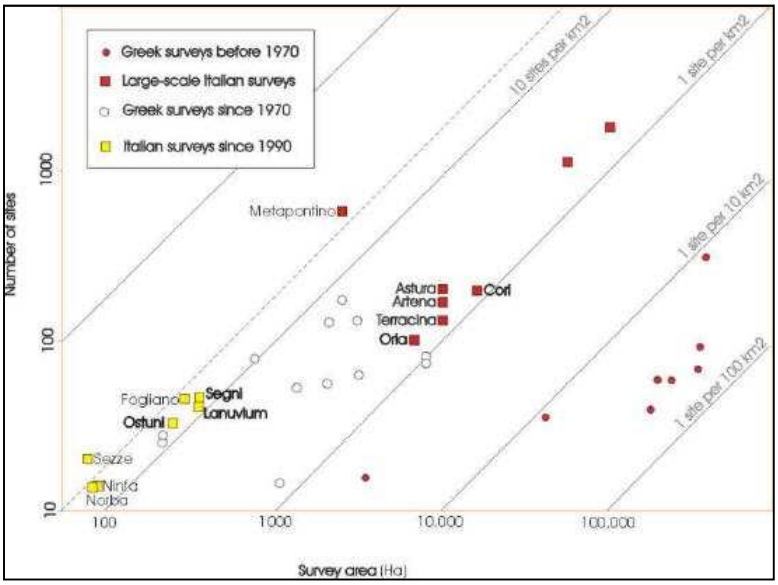


Figure 10 – Relationship between recorded site density and survey methodology (van Leusen 2002, 4-12, fig. 1; according to Cherry 1983, fig.1 and supplemented for recent Italian surveys).

These figures seem revealing, but the intensity of survey cannot be directly linked to the amount of discovered sites. One (substantial) point is the definition of the site regarding the abundance and size of surface scatter that used to be different in the old, extensive days. Project designs also differ considerably and perhaps the older surveys should not be compared with the modern ones as the methodology is suited for another agenda.

In fact, the "site issue" is a typical problem arising from the intensity of applied field techniques. Some artefact scatters measure only a few meters in diameter and may be easily missed by the usual transect width of 15, 10, or even 5 m. So not only do we not know how to define an archaeological site, but hardly ever can it be stated that the applied methodology was able to recover an adequate proportion of the smallest site types. An excellent example is the Umag survey where previously elusive prehistoric sites have started to appear in a considerable quantity with the improvement of field technique (Ch 7.1).

The question remains of what would be the ideal coverage intensity which would reveal close to all of the artefacts represented in the surface archaeological record, and how far it stands from field techniques in common use. This problem has been studied experimentally by many different survey projects. The study in the Oglala Grassland (USA), which is rich in lithic artefacts but also covered in

thick grass, has established that an approximate of total coverage could be reached only by crawling, in shoulder to shoulder array (Burger and Todd 2006, 242). The grassland setting of the Oglala study cannot be compared with typical ploughsoil surface, but at least it can give some impression of maximum intensity for artefact collection surveys. It seems that total coverage in ploughsoil fieldwalking would be a 2-2.5 m array, assuming each walker can scan at least meter wide on each side (Given 2004, 17), but several experiments show that this is still not enough. One seeding (scattering) experiment of the Cyprus Survey showed that a 5m array with an aim to total coverage (2.5m on both sides for each walker) recovered only 50%-70% of the artefacts. A kneeling collection from the same project on two collection units within a site produced a result of 773 and 358 sherds per 100 m^2 where the standard 5 m array recovered densities of 91 and 25 sherds per 100 m^2, respectively (Given 2004, 18).

Clearly, an ideal intensity of field survey collection is unattainable, and much discussion has been devoted to the choice of the technique that is reasonable in terms of economy and the quality of the data produced. It seems that the distance of 5 m between fieldwalkers that is used in many contemporary surveys is a maximum reasonable intensity (e.g. Trément 1999, 20). In fact, sites, regardless of their definition, cannot be supposed to follow the same function of decrease in size and increase in quantity. At a certain intensity a "point of diminishing returns" has to be reached, and M. Van Leusen argues it should correspond to 10 m spacing (van Leusen 2002, 4-13). Others consider the spacing of 15-25 m between experienced fieldworkers as appropriate for typical Mediterranean surveys (Mattingly 2000, 9). A. Ferdière, working in northern France, suggests 10 m wide transects for protohistorical and medieval periods, or 5 m ones for prehistoric or similar periods that are difficult to detect (Ferdière 1998, 19). Some authors point out that the spacing of the tracts should be adjusted to the experience of the team, denser array leaving less chance for oversights (Fasham 1986, 20; Mattingly 2000, 9). This is an important point as the spacing between the surveyors does not completely define the intensity. Speed and experience may have just as significant an effect on the end result (van Leusen 2002, 4-13).

The site-based collection techniques, deployed on scatters defined as sites or "areas of importance" may introduce further complications. Intensification on certain spots will introduce further disproportions regarding site/off-site relationship in terms artefacts quantity (density) and, consequently, diversity of the assemblage (van Leusen 2002, 4-6). On several surveys it has been noted that inconspicuous and rare periods have been almost exclusively recorded during intensive collections on scatters from other periods. For instance, in the Metaponto survey small, unobtrusive prehistoric finds were recorded on 11% of the discovered historic (Greek and post-Greek) sites (Thompson 2004, 72). However, on three quarters of these locations less than 10 prehistoric artefacts were collected, suggesting that what had been found were not discrete sites, but rather extensive, low density scatters. It is possible, in fact, that it is only because of

the site-based survey methodology that better-surveyed "windows" were opened on locations of much later archaeological sites, and that the prehistoric pattern of sites is mostly a product of this methodology (*idem*, 78). (However, a resurvey ascertained that these finds are indeed related to the original prehistoric site distribution, even if the result is biased because of the mentioned problem; idem 79).

5.3.3 Sampling

Sampling is the extracting and studying of a small portion of a statistical population in order to assess some properties of this population. The field survey approach has a troubled history of sampling, especially in terms of the choice of spatial coverage. One of the reasons is the heavy influence of the processual school, which favoured regional level studies in order to research complex cultural systems in a holistic manner. On the other hand, because of organisational and economical issues intensive surveys of large areas are not possible, and obtaining representative samples has emerged as one of the key issues in field survey methodology. However, the definition of a population poses a major problem, besides the common issue of the choice of the sampling method. Certainly, the object of archaeological study are always past populations, but a method that will directly enable inferences about these populations from the meagre remains that have been left and recorded simply cannot be developed. In order to reach a more operational level it is necessary to transform the human culture (population) to more manageable entities of archaeological population (space, sites, artefacts). As M. Van Leusen has remarked, this transformation is often ill-defined: "Exactly what that 'population' is, almost always remains undefined, but it is implicitly assumed to be either a) original distributions of archaeological sites, b) distributions of sites modified through taphonomic processes, or c) distributions of sites modified by both taphonomic and discovery processes" (van Leusen 2002, 4-4).

In the context of field survey methodology, sampling in the first place refers to the spatial component, that is, the choice of the tracts of land that are considered as representative of a larger region. Apparently, this approach is far more problematic than, for instance, a random selection of 10% of the artefacts form a large finds assemblage, which may be expected to reflect the overall variability of the assemblage. Sampling has, thus, stirred a large debate among the practitioners of field survey, but it has slowly gone out of fashion without a definite conclusion (c.f. Cambi and Terrenato 1994, 144). J. Bintliff presents arguments against sampling procedures in an almost dogmatic vein: "…the urge to take shortcuts in methodology via some supposedly 'representative sample', must be resisted at every opportunity." (2000, 201; however, see Figure 11). He points out, for instance, that in the surveyed sample of the island of Melos, Renfrew and Wagstaff may well have missed the only large town (*ibid.*). This issue has also been stressed by other authors such as K. Flannery, who refers to "Teotihuacan effect", i.e. the possibility

of missing the largest site in the region (such as Teotihuacan) by a sampling scheme (Flannery 1976, as cited in Orton 2000, 70). Cherry and Gamble have already discussed the problem in the 1970s, stating clearly that sampling strategy should be based upon previous knowledge, and that some sort of judgement is vital (Cherry and Gamble 1978, 22). It is, thus, false to assume that Renfrew and Wagstaff, or any other team, "sample in the dark". Had there been no previous information on Melos, they would probably have chosen some other island! Furthermore, most countries in the world already have an extensive body of knowledge about local archaeology.

In any case, continuous coverage of large pieces of terrain by intensive fieldwalking is an ideal best exemplified by Mediterranean surveys like the Beotia project led by J. Bintliff and A. Snodgrass. As pointed out by J. Bintliff, no sampling strategy will be able to reveal the subtleties of the settlement pattern within the landscape (Bintliff 2000, 203). The problem, however, is that Mediterranean surveys often choose areas exceptionally rich with surface finds (cf. Bintliff and Snodgrass 1988b), where every effort will be amply rewarded. Archaeologists operating in temperate Europe rarely have such an opportunity. Another problem is that many projects have to cope with limited time and resources (or patience), and that some result has to be obtained in a shorter period. Nevertheless, crude, large-scale sampling strategies, such as Ager Taraconensis, criticised by Bintliff (*idem*, 201), are indeed a bad practice as they cannot reveal any complex spatial pattern. This approach resembles excavation in long, narrow "test" trenches that has been superseded long ago. Another rarely mentioned issue is the usability of such a discontinuous dataset for heritage management and other local needs.

In practice, the overall size of a study area is directly related to the choice of field methodology, which produces a combined sampling effect on surface artefact population. The issue can roughly be summarised as *coverage size x intensity = 1/economy*, and also *sample= coverage size x intensity.* It is unlikely that a field survey project can gather the amount of resources required to cover a region comparable to Messenia with an up to date, high-intensity methodology. A sampling method would be necessary. The situation grows even worse, as today it is far more difficult to get stable and continuous support like in the case of Bintliff's and Snodgrass's Beotia project, which started in 1979 and is still for the most part unpublished (Bintliff 1985). Evaluating the classical dilemma in the field survey methodology – large and extensive, or small and intensive? – Nicola Terrenato argues that the decrease in size of modern, intensive field surveys "means that we now have to rely on a much smaller statistical basis for our inferences at the regional and interregional level, and this enormously weakens any kind of quantitative analysis of settlement patterns" (2004, 42). Furthermore, he backs up his position by criticizing the overly positivist approach in field survey that relies heavily on quantification and high-level statistical methods, and reconsiders the real effectiveness of detailed, formalised field techniques,

concluding that “no refinement in field collection technique is worth a drastic reduction in sample size” (Terrenato 2004, 47). This moderate stance, probably shared by many fieldworkers, is seldom expressed in the scientific arena (cf. Fentress 2000).

In sum, it can be said that probabilistic sampling strategies have lost in popularity over time, at least in the Mediterranean surveys. However, the increased intensity of survey methodology has inevitably lead to a discontinuous approach, choosing discrete, smaller areas that are supposed to offer a representative sample for a certain topic. Thus sampling cannot be avoided, especially in the context of specific research problems that demand an intensive methodology (Figure 11).

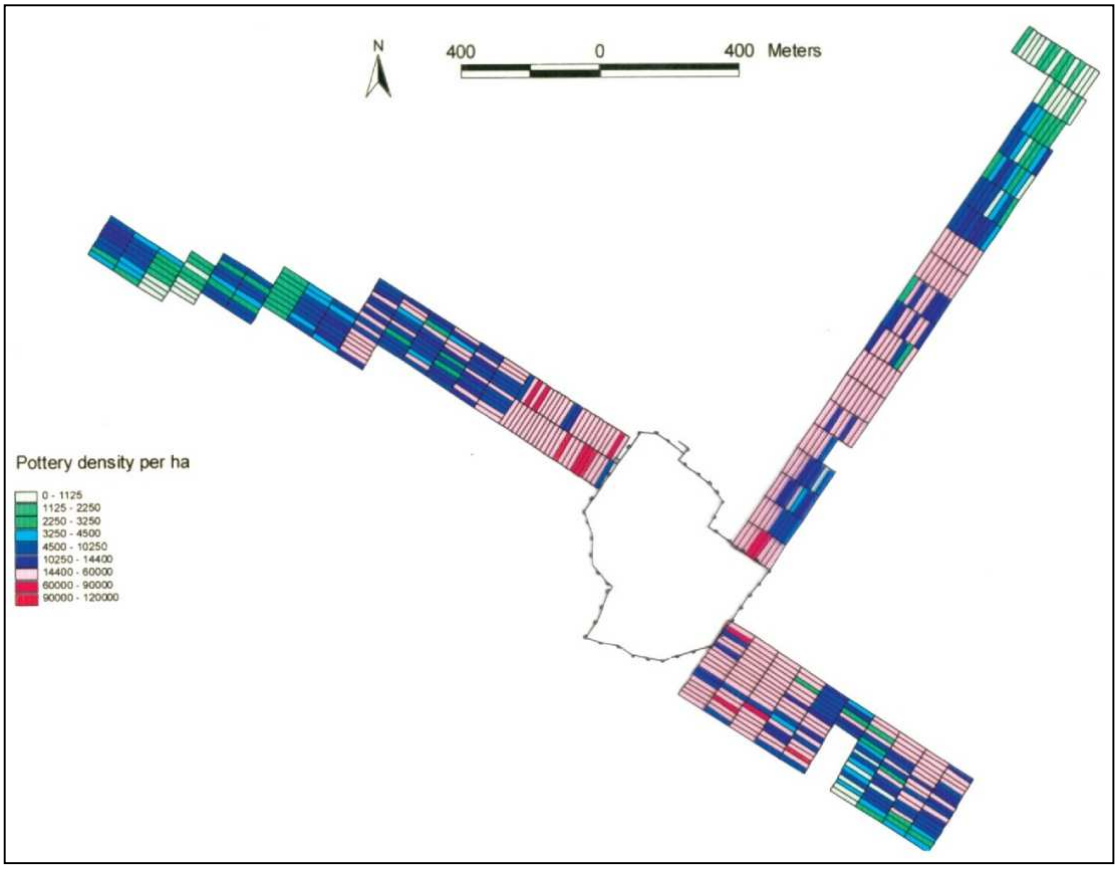


Figure 11 Sampling the immediate surrounding of an urban settlement (Tanagra, Greece) (Bintliff [prep.], 114, fig. 14-c)

There are several basic sampling strategies (c.f. Cambi and Terrenato 1994, 144-149, Novaković 2003, 146-151, Whallon 1983). The systematic approach starts with a predefined, regular grid which is applied to the research area. Transect-shaped sampling is usually the least demanding sampling scheme in terms of field survey organisation (Whallon 1983, 148). A problem may arise if the pattern of the

sampling grid is aligned with an archaeological landscape pattern, e.g. field system, and will thus produce a significantly distorted dataset.

Random sampling is a method designed for probabilistic statistical inference, similar to the systematic approach. The random placement of the sampling areas may eliminate the problem with the regular landscape patterns, but at the same time tends to produce a clustered sampling pattern, especially if the number of sampled areas is small. This may place excessive stress on certain portions of landscape, which, again, may differ from the rest of the sampled territory, whether in the archaeological record or in other features.

In both methods the phenomenon of the "march of the quadrants" may occur – the awkward landing of sampling areas on inaccessible or unpromising terrain (Orton 2000, 3). In fact, clinging to such a rigid scheme is not necessary for reasonable application of statistics, and can be modified without the fear of loosing probabilistic credibility (*ibid.*).

In order to improve the sampling procedure with previous knowledge, the population can be stratified, i.e. separated into distinctive groups. Probabilistic sampling can, then, be deployed for each group separately. Stratifying can be done on the basis of the local environment (geology, pedology, etc.) if its influence on the past societies has been previously established, as well as on the basis of archaeological data (roads, major settlements, artefact distributions, landscape features etc.).

Judgement or purposeful sampling is not a probabilistic method, and it is entirely based on the expectations and assumptions of the researcher. This type of sampling is biased by definition, and will have a profound effect on the results of a survey. The researcher risks overemphasizing areas or types of archaeological features that are assumed to be significant in some respect. However, it usually turns out that some completely unexpected finds or research problems emerge in the course of, or after the fieldwork, but the sampling strategy is inappropriate for their study. This approach can be expected to be more productive than those previously mentioned, as it draws heavily on previous knowledge, but at the same time is not predisposed for statistical analyses, and thus has different interpretative potential.

5.4 Techniques

5.4.1 Non systematic

Any differentiation between systematic and non-systematic methods is debatable and vulnerable to time. Regarding solely the techniques of surface survey, we shall include in the non-systematic category all

types of survey that do not aim to provide full coverage of continuous blocks of terrain, but rather concentrate on specific spots or areas that are considered to have better potential for discovering archaeological sites (*approche discountinué*) (Raynaud 1989, 60). As a rule there is no premeditated pattern of walking, and documentation is concentrated on sites, while the covered terrain can be only briefly described. It is not uncommon for a local archaeologist to spend more time on a certain area during an extended period of occasional reconnaissance than a team set up for systematic field walking, enabling him or her to amass just as rich and detailed a database. Therefore, non-systematic field survey does not necessarily mean less intensive, although this can only hold for rare cases.

In the case of non-systematic field survey it is not possible to share method and technique. It is a traditional practice of locating new or forgotten archaeological sites, often without much theoretical and methodological concern. Sites can be discovered in a number of ways and the documentation produced may vary accordingly. An unpublished survey done in the valley of the Dobra river (Croatia) can serve as an example (Figure 12). The survey was made as a student hobby in the years 1998-2002. About fifty field trips were made altogether. The aim was to register large, easily detectable sites like protohistoric hillforts, Roman settlements, and medieval strongholds. The choice of locations for survey was guided by toponimy, topographic features, or other characteristics that may sometimes indicate the presence of archaeological remains. Each site was briefly described and roughly sketched, but there had been no planning or other in-depth field research. A traditional diary was sufficient for most of the documentation (beside photographs). The method was, thus, essentially intuitive and the technique informal.

Apparently, the results of this small survey are heavily biased, chiefly in favour of the easily detectable hilltop sites. Without more detailed plans of sites and reliable dating sequences such work cannot be an end in itself. It is also problematic to what extent the settlement pattern is represented by larger sites. The Dobra survey shows the typical weaknesses of the non-systematic method: heavy biases and incapacity when faced with questions other than “What is there?” However, it has to be pointed out that the archaeology of the area was previously very poorly known. This survey gives a general picture of what can be expected in the area, what is the state of archaeological sites regarding modern land use, and what questions can be put forward for future research. The light technique is also appropriate because the Dobra valley is poorly cultivated and most of the sites are in the forest today. Even the river valley is only patchily cultivated, which does not allow for intensive artefact collecting techniques.

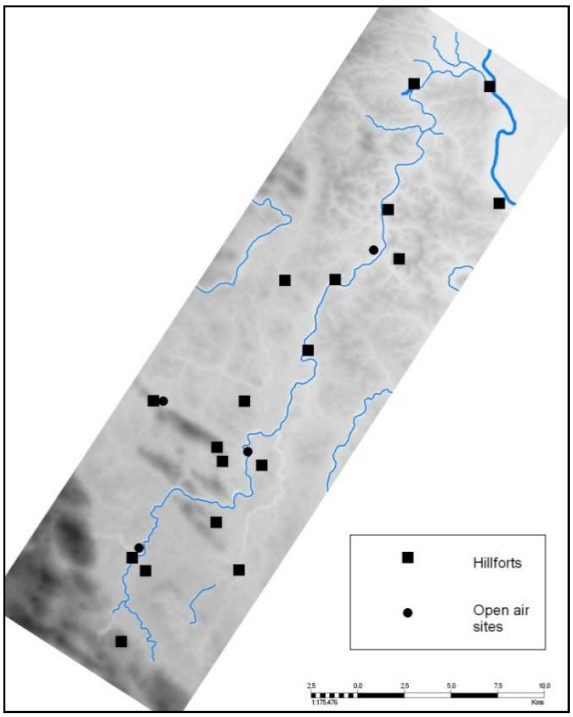


Figure 12 Sites recorded in the Dobra Survey

5.4.2 Feature survey

Survey oriented toward recording visible surface features, which are often to a large part comprised of earthworks or dry stone constructions, has a long tradition, especially in British archaeology (Taylour 1974). It is a site-intensive technique that can be integrated into a general survey methodology in a number of ways. In the Umag survey feature recording was done separately from the fieldwalking, as the suitable terrain was stony and densely covered in Mediterranean shrub, rendering a systematic approach futile. In a landscape offering better conditions it is possible to incorporate the surface survey into a systematic method. The distance between surveyors does not need to be as tight as in the case of artefact survey, since the topographic features are much larger. In northern Scotland, for instance, the distance was 50 m (Mercer 1985, 14). Besides cleared pastoral landscapes, very promising areas for feature survey are old forests, which may preserve ancient traces of field boundaries or settlements untouched by modern (and ancient) agriculture.

The feature survey is done today not only by traditional viewing equipment, like a compass or a theodolite, but more regularly by the “total station” (EDM) or positional GPS device. These technicalities should not concern us as the basic principles remain the same, although the increased use of equipment has reduced the need for a larger number of workers which, then, may reduce the constructive discussion

that may be of vital importance in the course of the fieldwork (EH 2007, 18). In the second part of this thesis we shall also present surveying techniques used in the Umag survey that did not rely on the use of expensive equipment.

As with most archaeological techniques, there is no single "proper" way of recording visible features, but instead, numerous examples can be found in the literature, some in the form of manuals like Taylor's *Fieldwalking in Medieval Archaeology* (1974), or English Heritage's *Understanding the Archaeology of Landscapes: A Guide to Good Recording Practice* (EH 2007). Basically two types of recording are used: the standard feature survey, and the contour survey. The latter is far more time-consuming because the main purpose is to cover the entire set of features with a tight grid of height measurements, in order to produce a 3D raster that can be used for contour map, a shaded relief model, or other forms of relief mapping. Although micro-relief mapping suites well into the excavation programme (Barker 2000, 60), and a rough plan of surface heights is a standard requirement before starting to dig anyway, for purposes of field survey it is regarded as too time-consuming, as well as poorly informative (EH 2007, 11). What is definitely the strength of the contour technique is a higher level of objectivity. The problem is that these "objective" results are very hard to obtain as well as to interpret and thus will normally produce less detailed information. Certainly, the story is different with the technology of LIDAR scanning that can produce incredible relief rendering with ground resolution of a dozen centimetres, but it will take long time before the scanner becomes widely available. Perhaps the most useful contour mapping can be achieved in combination with classic feature survey (EH 2007, 11). This way the contours are used to render the general topography of the site, which is very messy when done using hachure, while the archaeological detail is picked up by standard drawing.

The traditional hatching technique consists in the simple recording of the slopes that form ditches, banks or terraces (e.g. Sv Petar, Ch. 9.1). As the web of these features can be extremely intricate, experience is vital. In contrast to contour survey and other 3D renderings, hatching can be used to distinguish natural and artificial features and their chronological relations (EH 2007, 11). The Mediterranean environment offers a different setting than the one in which British "earthwork" survey developed, adding extensive drystone walls and other stone constructions to an occasionally detailed earthwork raster. There are some good examples of recording practice in Croatia and Bosnia (figure 13), but the problem of the detailed planning still remains[13]. The stone structures hold great interpretative potential and may well be worth of a more detailed recording technique than the one used for the usual 1:1,000 plans (see Ch. 9.2.1).

[13] Very nice drawings of similar style as on Figure 13 can be found in publications of M. Menđušić (e.g. idem 2000) which we do not reproduce here due to a technical problem.

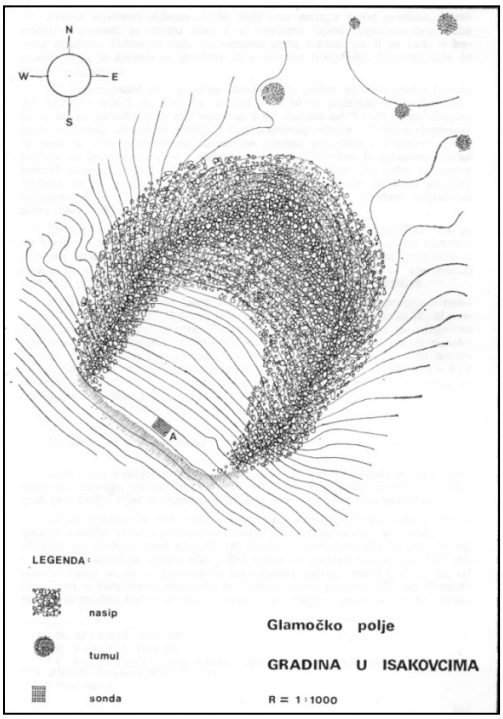


Figure 13 An example of a traditional topographic plan (Benac 1985, plan 23)

5.4.3 Systematic field survey

The principal postulate of systematic field walking is controlled and premeditated coverage of terrain. What and how has been surveyed is an essential part of the documentation, unlike reconnaissance and similar non-systematic surveys that allow for much more liberty and flexibility. Methodological rigour is, as a rule, based on intensifying the surface research in terms of average amount of time spent on a unit of land, although these two concepts (intensity and formalism) should not be confused. The survey by Chapman and Batović in northern Dalmatia was done in kilometre-wide tracts with 25-50 m transects, and, as available maps were of smaller scale (1:25,000), the accuracy achieved was 50-100 m. This style of work was chosen because of the vast size of the study area (2,200 km^2), and the intensity of survey was rather low (Batović and Chapman 1985, 165-166).

The typical use of systematic field survey is in the artefact-rich landscape, and it can be said that the method has developed as a response to such an environment. However, it can be used on any kind of terrain that has some detectable archaeological features. In Britain such an approach has been extensively used in grass- or forest-covered areas that abound in fossilized archaeological features like ancient field systems and numerous earthwork sites (*cf. supra*). As the features are of considerable size, in this case systematic feature survey can approach "total coverage" with moderately spaced transects (e.g. 50 m).

Certainly, this is not directly related to the success in data recovery; experience of the team and good indoor preparation may be of even bigger significance (Mercer 1985, 14). It is, therefore, good to distinguish the intensity of survey from overall data recovery rate, as noted earlier. More intensive might not always be better, especially if other circumstances that influence the success of field survey are not thoroughly accounted for in the planning stage.

Technique

The technique used by a field survey team can be briefly defined in terms of collection unit and recording unit. As D. Mattingly has noted, the terminology employed by different archaeologists to refer to these is "bewilderingly inconsistent" (2000, 8). Trying to make some order, he makes the following distinctions:

- Tract: arbitrarily defined primary collection unit, sometimes co-terminus with modern fields, sometimes superimposed over several of them.
- Traverse: collection sectors of standard size covered by line-walkers.
- Transect: corridors (often of varying length) followed by individual fieldwalkers in collection from tracts of irregular size and shape.(Mattingly 2000, 8).

Sometimes the transect is the primary collection unit (regardless of whether artefacts were actually picked up or just counted and left in the field), while the tract remains the primary recording unit – this was the practice employed in the Umag survey because it is very useful in the agricultural landscape. Some surveys, especially in the earlier stage of the development of the method, were designed with standardized sampling units regardless of the situation on the terrain, but the popularity of this approach seems to be diminishing. Unless operating in a very homogenous environment it will soon bring a burden of technical and organisational problems to the team, who will be forced to jump over the field boundaries and to cover diverse terrain types within a single tract. Laying out a regular grid also requires a certain amount of time and effort. With the disappointment in the sampling methods in regional survey that did not produce answers to "big questions", the need for standardized blocks of covered terrain have become less pronounced, although keen GIS users still prefer gridded layouts (e.g. van Leusen 2002, 11-4).

The choice of appropriate survey technique depends in the first place on the aims of the project and the character of archaeological finds that are expected to be encountered in the field. Typically, survey techniques differ primarily in the intensity of surface coverage and finds policy, while the basic principles remain the same (division of terrain into regular units, adjustments for walking prospection, etc.). Although due to the great diversity of approaches a clear-cut categorization of survey practice cannot be made, three typical variants can be distinguished.

The old-style extensive survey is oriented towards the discovery of larger, prominent sites in a larger area. Sometimes more akin to the non-systematic survey, as defined here, this approach is now superseded (c.f. Cherry 1983). A good, albeit very early, example is the Messenia survey discussed above (McDonald 1972). The principal aim of the extensive survey is to obtain truly regional coverage, which generally cannot be combined with high-intensity field techniques. This may be an important advantage, but it can be said that the other problems with too low intensity of survey (i.e. big site bias) are much more significant issues, causing this method to be pushed out from the Mediterranean survey arena since the 1980s.

Site-oriented systematic survey, often termed extensive when compared to off-site and other more intensive approaches, is also somewhat declining in the wake of recent methodological developments, but is still widely used. The scrutiny needed for recording off-site and similar fine-grained data is sacrificed in order to allow for greater economy of research. In this way a wider sub-regional perspective is obtainable in reasonable time. Several authors argue that this benefit may outweigh disadvantages arising from the coarser methodology (Fentress 2000; Terrenato 2004). An example of a rather coarse systematic survey is the Neothermal Dalmatia project, with 25-50 m wide transects. However, this approach has allowed the team to cover a large area in few campaigns, producing valuable results that refer to the entire region of northern Dalamatia (Chapman, Shiel and Batović 1996).

More intensive terrain coverage predominates in field survey methodology today, usually in combination with an off-site strategy in regions where this type of data abounds (Bintliff 2002). This methodology is an outcome of continuous development towards increasingly intensive techniques since the “New Wave” surveys of the 1980s (*ibid.*). The transect size is typically set to 15-25 m, often 5-10 m, and a significant amount of attention is devoted to artefact level recording, although this is very variable from project to project. Most of the discussion in this methodological introduction referred to this type of survey.

Finally, a purely artefact-oriented approach, boasting independence from the problematic site concept, is the so-called “siteless survey”. Consequently, this style of work has to be very intensive, although this is not related to its definition. Archaeological sites can be determined *a posteriori*, in the process of data analysis, on the basis of a dense grid of data. As mentioned above (Ch. 3.3), this approach has been developed in the specific context of the archaeology of mobile societies, and its application on Mediterranean landscapes, strewn with artefacts, can be extremely time-consuming. However, the intensive survey of the off-site type can also produce results that approach siteless survey in terms of the potential for *a posteriori* definition of sites, as exemplified by the Umag survey (Ch. 7.1, 9.2.3, 10.5.2). In

fact, the siteless approach of the Eastern Corinthia Survey, organised in 10 m wide transects and small tracts (mostly less than 0.25 ha) is quite comparable to the Umag survey, if not even coarser because of clicker-counting artefacts (Caraher, Nakassis and Pettegrew 2006, 13).

5.5 Finds policy and temporal resolution

Dealing with vast amounts of highly deteriorated fragments of low archaeological value has been a constant problem in field survey. On the one hand, the carpet of countless artefacts usually forms the most important part of the surface archaeological record, at least in typical Mediterranean field surveys, while on the other, recording, collecting, and studying these artefacts in detail is often unrealistic or unattainable. Therefore one of the crucial decisions that should be considered before, as well as in the course of the fieldwork is to devise a recording and collecting policy that will strike a good compromise between the economy of the project, the intended post-survey analyses, and, above all, the actual complexity of the archaeological record encountered. D. G. Yntema points out that "A field survey with a very limited quantity of diagnostic wares or without expert knowledge of regionally current ceramics of the periods on which the survey centers offers no sound basis for regional studies and is to be considered a waste of time and money" (Yntema 1993, 29: as quoted in van Leusen 2002, 4-6). This statement is rather harsh and many projects can be considered "a waste of time and money", but it does underline the severe problem that was also encountered in the Umag survey. Here virtually no diagnostic prehistoric sherds were found and a very limited number of Roman or later pottery fragments, leaving many sites without any narrowly datable artefact. Better knowledge of local wares gained from excavations in Umag and its surroundings has been of some help, but this still does not allow for a finer dating of the sites than into broad periods like Bronze Age, Iron Age, Classic Roman, Late Roman, etc. This state of knowledge imposes a very serious obstacle for any in-depth analysis, as it cannot be determined which patterns are contemporaneous, or in what amount of time they developed. It seems that a large part of agrarian Roman sites was contemporaneous at some point in time, but nothing can be said of the development of this pattern and it subsequent evolution in Late Roman times (Ch 10.4.1).

An acute problem in field survey methodology is that of diagnostic finds. Distinguishing easily datable material for collection in the field is a very practical procedure, usually reducing at least tenfold the amount of finds destined to be collected and/or studied. However, this can be a very subjective procedure, dependant upon previous knowledge or assumptions that may not be entirely appropriate. Reliance on diagnostic pieces will "give rise to tendency to concentrate collection and recording practices on those parts of the surface archaeological record which are amenable to functional or chronological

interpretation" (van Leusen 2002, 4-6). Furthermore, the choice of diagnostics is, as a rule, a very biased sampling of surface artefact populations. The bias can be multiple:

a) Better known periods
b) Imported, foreign ware
c) Industrial and high-output products
d) Better quality ware

Combining a) with d) is a fitting description of the material that actually makes the bulk of Mediterranean survey data, i.e. historical Greek and Roman industrial production like terra sigillata or amphorae. Furthermore, well-fired pottery, such as terra sigillata, is much more conspicuous than local wares, especially prehistoric ones. This issue has already been mentioned with regard to differential visibility properties of certain periods and types of artefacts (5.2). Caraher *et al.*, for example, question the established model of the Late Roman prosperity of Greece on the basis of a disproportionally high share of very characteristic coarse pottery types produced in the period, which tend to be heavily overrepresented in survey accounts (Caraher, Nakassis and Pettegrew 2006, 23). J. Chapman refers to this effect as "the tyranny of pot typology" in his wide ranging critique of the "pots=people" paradigm that is supposed to persist among survey practitioners (Chapman 1999, 65-66). Therefore, a careful approach is necessary, in which more attention is paid to a collaboration of the finds specialist and the fieldwalking team. It may be argued that in many cases an intelligent combination of thematic surveys can be more fruitful than an over-ambitious, all-period, regional one. Similar to the issue of the relationship between survey area size and the methodology applied, the temporal resolution is also affected by the intensity of field collection. This has been noticed in the Umag survey (Ch. 7), where only detailed, time-consuming techniques provided the better samples of surface finds needed for finer-grained dating. A similar experience from the Metaponto survey has been mentioned above, where certain periods have been detected almost exclusively during intensive, on-site collection (page 50). The diversity of the sample is closely related to its size.

5.5.1 Off-site finds policy

The off-site presents an even bigger problem because of the enormous quantity of artefacts that cannot be thoroughly collected and studied indoors. Therefore, most of off-site material has to be determined quickly in the field, while only a small amount of artefacts would be available to indoor specialist.

Probably the worst solution (and very popular in the past) is clicker-counting all the off-site artefacts together (Bintliff 1992, 92), thus producing an interesting but potentially very deceptive image. An even

cruder variant of the technique was applied in the first Umag survey, but was subsequently abandoned (Ch. 7.1). It may be true that the bulk of the off-site material often tends to concentrate on a shorter period of intensive agriculture (typically Classic Roman on the western Mediterranean) (Bintliff [prep.], 113). However, it will certainly contain artefacts from other, less represented but no less interesting periods. Furthermore, many areas witnessed multiple periods of off-site deposition, like in the case of western Bujština, where intensive artefact deposition took place in Roman as well as in post-Medieval times. The positive aspect of the clicker approach is the speed, but it should be carefully considered against the mentioned drawbacks. A solution, proposed by D. Matingly, can be to obtain the total collection on one part of the tract, for instance by one fieldwalker inside his transect, while others continue to record by clicking and collecting a small sample (Mattingly 2000, 9).

In the Umag survey, the all-period count was abandoned at the beginning of the second season in favour of the broadly dated counts for each transect. This data has proven to be very useful, even if the dating categories were very coarse (Prehistoric, Roman, Late Roman/Early Medieval, Medieval, and Modern). However, it has also turned out that the dating of dirty finds in outdoor conditions is much more liable to error than in the museum depot.

One more recording practice should be avoided: supplementing all-period off-site counting with a grab sample of diagnostic pieces (Given 2004, 17). This sample will say nothing of the real proportions and dates of off-site material, as it may not only put too much stress on the most visible periods, but it may include pieces that indicate site remains or other specific activities into the off-site.

Some projects go so far as to record every archaeological artefact in the ground, like the “Rapatel method” devised by P.-Y. Genty, J. Kotarba and J.-M. Pène (de Chazelles *et al*. 2002, 107). However, this French method does not include regular collection except in a 100 m^2 test square per site. This will produce a spatially highly precise dataset, which may not be justifiable considering the problem of on-the-spot dating that is both inaccurate and impossible to reassess in comparison to the one done in the pottery workshop.

Several authors doing large-scale, extensive systematic survey research have taken a critical stand towards “uncritical counting” that they see in many intensive projects (c.f. Fentress 2000; Terrenato 2004). E. Fentress, for instance, sees much of the off-site material as a “highly degenerated sample”, which can only with difficulty be interpreted in any sense and therefore does not justify spending a big amount of time and effort (Fentress 2000, 48). Only a casual approach towards off-site recording, i.e. one which would not slow down the work, is considered as appropriate (*ibid.*). However, we believe that the

results of the Umag survey presented in Part II of this thesis provide sufficient argument in favour of an appropriate, intensive off-site approach.

5.5.2 On-site finds recording

Recording sites, the most important outcome of the majority of Mediterranean surveys, suffers from the same problems as survey methodology in general (sampling strategies, visibility issues, survey intensity, etc.). As experienced in the Umag survey, a bad site record renders the survey half-finished and unsuitable for any higher-level inference (e.g. Ch. 10.4.1). However, the expenditure of time required for intensive finds collection and subsequent analysis may hamper the survey progress even more than off-site recording. A fragile balance between gathering a satisfactory amount of data and the economy of survey organisation has to be carefully considered. This is very difficult to asses prior to the survey, especially if the characteristics of the surface record are not known. Fine adjustments are often done during the beginning phase of the survey.

Intensive, total collection of surface artefacts is a standard archaeological technique, but it is too time consuming to be applied systematically in field surveys. Usually a smaller number of sites, out of dozens or hundreds recorded, can be chosen for detailed inspection. In Croatia this technique was deployed as a part of rescue archaeology on highway construction sites (Burmaz 2006), and as part of a detailed feature survey of the Illyrian stronghold of Nakovana on Pelješac (Forenbaher and Rajić-Šikanić 2006). The results were rewarding in both cases. The Nakovana project has succeeded in differentiating spatial patterns of surface artefacts from the Bronze/Iron Age and Helenistic periods that may have social implications, and the intensive collection on the highway near Zagreb has succeeded in locating very scant remains of a Bronze Age settlement (*ibid.*). However, gridded collection very often does not produce the desired results, at least considering the expended time and resources. E. Fentress argues strongly against systematic application of total, gridded collection, as in most cases all that is discernible in the collected artefact assemblage will be only what has been readily apparent prior to collection (Fentress 2000, 49). We have also experimented with this approach, but the results were not as impressive as hoped for, especially when considering the amount of time spent (see Ch. 9.2.1: Sv. Petar and Ch. 11: Sipar). Clearly, the total gridded artefact collection has to be considered carefully against the influence of the formation processes and overall diversity of artefacts that should be observed previously, prior to its application.

A quick and systematic approach to site recording is exemplified by the Beotia survey. After two years of experimenting, sampling techniques and total collection were abandoned since they slowed down the work and did not produce data of the expected quality of. A temporary intensification of the standard

fieldwalking procedure emerged as the best solution in cases when a site scatter was encountered. The distance between walkers was halved (7.5 m) and transect length set to 10 m, but this time all of the ground within transects was surveyed. Only diagnostic pieces, along with a range of fabrics, were collected (the so-called grab sample) and the density recorded with a clicker (Bintliff 1985, 202-205).

In the Hvar survey two procedures were applied. A total finds collection was done in a 10 x 10 m grid, providing a good sample of artefacts. Another approach was augering survey, not a very frequent technique in the context of fieldwalking survey, which enabled an assessment of the depth and finds density in the surface layer. This proved to be very useful on terrain with bad surface visibility (Bintliff, Gaffney and Slapšak 1989, 44).

5.6 Non-discovery (evaluative) techniques

A need for additional, usually highly intensive techniques not primarily aimed at the discovery and recording of new archaeological data has arisen with the interest in formation processes operating in the surface archaeological record. What distinguishes these approaches is not so much the techniques themselves but rather their application in overall survey methodology.

Perhaps the most widespread evaluative method is simple repeated field survey, which has the purpose of assessment of formation processes over a certain amount of time, or evaluation of the recovery rate (success) of previous field techniques. An early systematic application of this method was by A. J. Ammerman in Calabria. The resurvey indicated that only after several passes the point could be reached where no new sites would be discovered. This raises serious doubts on the recovery success of field surveys (Ammerman 1981, 79). One of the projects where resurvey has been undertaken seriously is the Metaponto survey, where at least a half of two seasons was dedicated to repeated fieldwalking (Thompson 2004, 71). The basic purpose was to reassess the results of previous work made with somewhat coarser methodology in the early 1980s.

That non-discovery approaches can grow into an autonomous methodology has been shown by O. Burger and C. Todd (2006) in their work on a survey project in the Oglala National Grassland (Nebraska, USA). The method was based on plant ecology studies, more precisely the new approaches devised to cope better with rare species that were claimed to be underrepresented in studies based on typical sampling methods employing sampling units of similar size. The collection was organised in Modified-Whittaker plots which enable nested levels of survey intensity. First the entire plot (1,000 m^2) is covered by standard fieldwalking in c. 70 cm transects and all artefacts duly recorded. The second stage is a “crawl survey” of smaller plots (Figure 14) where surveyors are squeezed shoulder to shoulder. The

second approach recovered 362% more artefacts than the walking survey and has proven to approximate total recovery. The results have enabled the evaluation of standard field methodology and also of formation processes that contribute to the specific preservation of the surface archaeological record.

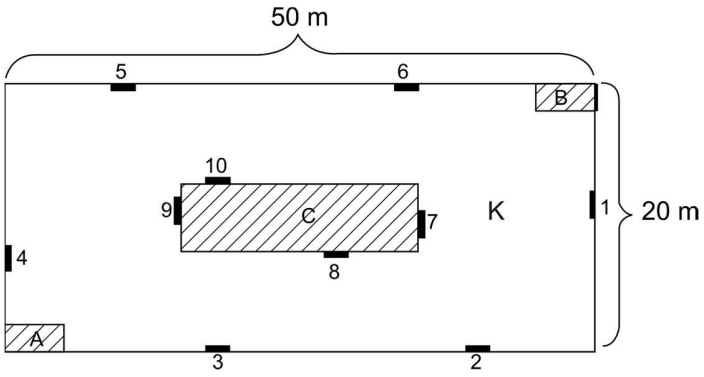


Figure 14 Modified Whittaker plot (Burger and Todd 2006, 251, fig 15-2).