TÆSP Troodos Archaeological and Environmental Survey Project

Fourth Season, 2003

Field Manual

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NO ARTEFACTS, SLAG FRAGMENTS OR GEOLOGICAL SAMPLES MAY BE COLLECTED UNLESS AS PART OF A RECOGNISED PROJECT COLLECTION UNIT.

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1. Introduction and Project Goals

The Troodos Archaeological and Environmental Survey Project (TÆSP) is an international, interdisciplinary project which began work in the Troodos Mountains of north central Cyprus in June 2000. Its forerunner, the Sydney Cyprus Survey Project (SCSP), established an innovative survey methodology, recorded a wide range of previously unknown sites and settlements, and made a key contribution to our understanding of the origins and development of social complexity in prehistoric and historic-period Cyprus, especially concerning the dynamic between copper production and agricultural exploitation.

TÆSP builds on this knowledge, experience and methodology, but addresses a broader range of issues and work in a new, important and previously under-explored part of north central Cyprus. The principal aims of the project are to investigate the wide range of human activity and settlement in the area; to examine the area's archaeometallurgy and to study the emergence and development of agricultural production using a wide range of interdisciplinary techniques; and to investigate the social changes that occurred as a result of metallurgical and agricultural production as expressed throughout the entire landscape.

TÆSP's first field season ran for three weeks in June-July 2000, with a team of 15 people. During this season we carried out general reconnaissance of the proposed survey area, ensured that equipment and materials and methodology were in order, and conducted some preliminary survey. The second season ran for five weeks in June-July 2001, with a team of c. 25 people, and the third in June-July 2002 with c. 40 people. In both these seasons three field teams worked in the middle Karkotis Valley, Asinou, Mandres, and Xyliatos *Mavrovouni* areas. The summer 2003 season will be the last full field season. We will hopefully have a small season in autumn 2003 to survey fields after they have been ploughed. A final season in 2004 will be a study season in preparation for the final publication of the project.

The core components of our field strategy consist of Survey Units and Geomorphological Units arranged in transects running through the survey area. Fieldwalkers (5 m-spacing) traverse these units; each of four field teams (with an archaeologist as team leader, a geomorphologist and three students) counts and samples all artefacts within each Survey Unit, and records environmental data from the corresponding Geomorphological Unit. Areas of particular importance are sampled using contiguous Survey Units (block survey), more detailed geomorphological mapping, and recording of anthropogenic features. At the most intensive level, we investigate specific areas of human or environmental significance with various gridding, mapping and sampling techniques.

At 161 sq km, the survey area embraces much topographical, environmental and cultural diversity, in which we carry out geomorphological and other specialist analyses and extensive survey. Intensive transect survey is conducted in six 'Intensive Transect Zones' currently totalling 23.6 sq km, which gives both a topographical cross section and a significant sample of the entire survey area.

General Research Questions

1) What do landscape factors (settlement patterns, site hierarchies, land use patterns) and communication networks tell us about social and economic organisation (households, communities, regions)?
2) What alignments of environmental factors — e.g. physical landforms, biota, surface water — are associated with different types of social organisation? On what spatial and temporal scales?
3) What long-term impacts do changes in land use and land cover have on social structures and settlement patterns? How persistent and on what scales are the impacts of mining, pastoralism, agriculture, forestry and other human industries?
4) What can we learn about the nature and development of resource exploitation, in particular agriculture and copper production? How do these relate to socio-economic structures or to technological development, and how do they change through time?
5) To what extent can we improve our understanding of local modes of production, trade and social organisation through time by spatial and fabric analysis of the ubiquitous but hard-to-date utilitarian pottery?
6) What impacts do imperialism and other forms of external political or economic domination have on the landscape? How does the landscape, in turn, impact on imperial power and local resistance?
7) How can intensive field survey be combined with ethnography, architectural analysis, and oral or documentary history to investigate the interaction between people and their landscapes?

Period-Specific Research Questions

1) Pre-Pottery Neolithic: do any of our 'lithic' or special-activity areas correspond to other Cypro-PPNB sites?
2) Chalcolithic: can we identify the expected regional clustering of sites in the TÆSP area?
3) Prehistoric Bronze Age: can we locate any settlements linked to the important cemetery at Katydhata?
4) Protohistoric Bronze Age: how can the copper-rich Skouriotissa area inform us about factors of production, consumption and social organisation during this dynamic urban era?
5) Archaic-Classical: how did the prosperous city-kingdom of Soloi exploit its hinterland?
6) Hellenistic-Roman: what are the relationships between large-scale copper production, the manufacture of utilitarian pottery, rural agricultural sites, and trade connections within the eastern Mediterranean?
7) Byzantine period: by documenting the much-neglected non-elite material culture of this era, can we gain new insights into social change and landscape organisation within the densely populated Karkotis Valley?
8) Medieval to Modern: how did taxation and imperialism impact on the rural economy? How are factors such as pottery production, water rights, and people's perceptions of their landscape related to social organisation?

2. Conventions, Abbreviations, Technical Terms, Unit Numbers

We are an international team with varying conventions. Please standardise as follows:

Dates. Use European convention of day-month-year. June 25th, 2000 should always be written 25/06/00.
Numerals. Please write 7 with a cross-bar, and 1 without an upstroke
All dimensions to be recorded in metres or millimetres
All weights to be recorded in kilogrammes or grammes
Location: Easting/Northing/Elevation is taken for the centre of the recorded area (SU etc).
For the purpose of sorting in the database, please use leading zeros, as defined in the following list of abbreviations (e.g. GU0023, not GU23)

Abbreviations and Technical Terms

AU01	Archaeometallurgical POSI Unit
BU001	Building Unit
CT001	Circle in Transect (for areas of poor visibility; no longer in use)
GI	Geomorphological Investigator (geomorphologist on each field team)
GU0001	Geomorphology Unit
IP0001	Image Print (i.e. printout of scanned and registered aerial photo, for mapping on)
LU0001	Lithostratigraphic Unit
NU01	GeobotaNy Unit
POSI	Place of Special Interest; ID numbers prefixed 'TP'
PU01	POSI Unit (sequential system; E0N0 etc for coordinate system)
PUE0N0	POSI Unit (coordinate system); E2N5, E3N5, W2N5, W3S1, etc. Use the PU prefix.
SIA	Special Interest Area; ID numbers prefixed 'TS'
SU0001	Survey Unit
TB001	TÆSP Geobotany Location
TIA001	TÆSP Inventory: Archaeometallurgy
TIL001	TÆSP Inventory: Lithics
TIS001	TÆSP Inventory: Special Finds
TIP0001	TÆSP Inventory: Pottery
TM001	TÆSP SaMple
TP001	TÆSP Place of Special Interest
TS01	TÆSP Special Interest Area
TT	TÆSP Transect. e.g. TT3880000N (East-West) or TT497000E (North-South)
XU	Χώμα Unit, i.e. Soil Unit

Allocation of unit numbers

Year	West	Central	East	X
2000	SU0001 – SU0012			
2001	SU0013 – SU0104	SU0300 – SU0395	SU0600 – SU0661	
2002	SU1001 – SU1099	SU1301 – SU1390	SU1601 – SU1710	SU1901 – SU1920
2003	SU2001 –	SU2301 –	SU2601 –	SU2901 –

Year	West	Central	East	X
2001	GU0001 – GU0093	GU0300 – GU0368	GU0600 – GU0662	
2002	GU1001 – GU1080	GU1301 – GU1368	GU1601 – GU1678	GU1901 – GU1923
2003	GU2001 –	GU2301 –	GU2601 –	GU2901 –

BU, Film, IP, and POSI numbers: use the sign-up sheets on the noticeboard to take the next available number

PU: each POSI has its own independent series of PU numbers, so they should be assigned by the team leader

All other unit numbers should be assigned by the appropriate specialist

3. Database and Data Management

In order to make sense of the enormous amount of data collected by the project, we have established a series of five progressively more detailed levels:

- *reconnaissance level*, a landscape-wide picture of the study area;
- *survey level,* a detailed collection of data in the field;
- *finds level*, an initial identification and recording of artefacts removed from the field;
- *inventory level*, detailed recording of items identified as important for cultural, methodological or intellectual reasons;
- *ancillary level,* data pertinent to all these levels such as photography, drawing and sample records.

LEVEL	Item recorded		Form required
RECONNAISSANCE	SIA	Special Interest Area	SIA Recording Form
	POSI	Place of Special Interest	POSI Recording Form
SURVEY	AU	Archaeometallurgical POSI Unit	Archaeometallurgical POSI Unit Form
	BU	Building Unit	Building Unit Form
	GU	Geomorphology Unit	Geomorphological Unit Form
	LU	Lithographic Unit	Lithographic Unit Form
	NU	Geobotany Unit	Geobotany Unit Form
	PU	POSI Unit	POSI Unit Form
	SU	Survey Unit	Survey Unit Form
FINDS		Pottery	Pottery Finds Form
		Lithics	Lithic Finds Form
		Archaeometallurgy	Archaeometallurgy Finds Form
		Other Finds	Special Finds Form
INVENTORY	TIP	Pottery	Pottery Inventory Form
	TIL	Lithics	Lithic Inventory Form
	TIA	Archaeometallurgy	Archaeometallurgy Inventory Form
	TIS	Special Finds	Special Find Inventory Form
ANCILLIARY		Drawings	Drawing Record Form
		Image Print	Image Print Record
		Interview record	No form; use database
		Maps	No form; use database
		Photographs	Photograph Record Form
		Samples	Sample Record Form
		Soil Profile	Soil Profile Record Form

To record all this data TÆSP has 22 paper forms, some of which will become more familiar to you than others. Whilst all data is to be stored in a computer database, the paper forms remain our primary record and as such must be legible to everyone, not just those who completed them. Paper forms are the place for short, concise records; longer notes and narratives should be made in notebooks and a reference noted on the record form. It is important that these are completed as fully and as neatly as possible, in black ink for clearer photocopying.

Each project member will be assigned a unique, three letter Personal Identifier (PID). This will be based on your name, although not necessarily your initials, and should be used on any form, paper or digital, that requires you to identify yourself. This system ensures there is no confusion between members with the same initials or similar names.

Each of the 22 paper forms has an equivalent form in the relational database – TÆSP*Data*. Everything recorded will be entered into the TÆSP*Data* to provide a comprehensive, integrated archive of the project's findings that is easily stored, disseminated and manipulated to output meaningful results.

The database, constructed in Microsoft *Access* 2000*,* has been designed to avoid intimidating its users. Basic computer skills should be sufficient for anyone to enter information into TÆSP*Data*; instructions are clear, on-screen buttons are provided for most operations, and Help and Feedback files are accessible from the front menu. The basic structure of the database and the data-entry format are established and are unlikely to change; data extraction routines will be further developed during the season.

Once entered, all data needs to be audited (by someone other than the recorder or enterer). This involves checking the paper form against the database record. Once each record is done, initial and date both the form and the database record. If there are any anomalies, try and resolve them by asking the person who originally did the recording. If you can't, note the problem in the 'Comments' field of the database record. After auditing, the database record becomes the primary version; the paper forms will be maintained just as an archive.

Summary of the TAESP File Structure

C:/TAESP/ (or, during the field season, X:/TAESP/)

- /Administration (team and equipment lists, season-specific documents)
- /Database (including documentation and paper forms)
- /GIS (including documentation, aerials and all spatial data)
- /Images (photos, drawings, maps; but no GIS data)
- /Methodology
- /Reports
    - By area: Intensive Survey Zone; SIA; POSI
    - By year: team & specialist reports; general reports; publications

4. GIS

Our Geographic Information Systems programme is ArcGIS 8.1 (though we also use ArcView, Idrisi, ERDAS Imagine and ENVI for specific purposes). TÆSP ArcGIS files must always be put into a folder called 'X:\TAESP\GIS' ('C:\TAESP\GIS' outside the season). There will be opportunities for further practice and training before fieldwork begins. ArcGIS is a complex and slightly intimidating program at first, but rest assured that within a very few days all these procedures will become second nature.

During field seasons, most team members will come into contact with ArcGIS through digitising Survey Units and POSI Units. This should be done by the same team member who drew the outlines of the unit on the **image print** while in the field. ('Image prints' are A4-size, scanned images of aerial photographs with UTM grid superimposed.)

Basic digitising

Open the map. On the computer reserved for GIS, open the relevant Map Document (with file extension .mxd) for your team. It will be located in X:/TAESP/GIS/ArcMaps, but there will be a shortcut on the desktop. This map document should have the relevant Aerial photograph, SU, GU and POSI layers for your team. These layers are listed in the window on the left; they should have a tick in the box to show they are turned on.

Find the place. Use the magnifier (+ and -) and pan (hand icon) tools to find the right place, and zoom to about the same scale as the image print, or slightly closer. There are various ready-made settings under 'View/Bookmarks'. You can save additional ones by 'View/Bookmarks/Create'.

Start editing. Press the 'Editor' button on the Editor Toolbar, and select 'Start editing'. It will ask which folder you want to edit: the SU, GU and POSI layers are all in the 'Survey' folder. Make sure 'Task' in the editor toolbar says 'Create new feature'.

Choose target. Under 'Target' in the Editor Toolbar, select SU, GU or POSI, depending on what you are digitising. If you digitise onto the wrong layer, select the objects you have wrongly digitised, cut them, select the correct target layer, and paste them.

Open attributes table. Press the page icon at the right hand end of the Editor Toolbar. This opens a small window where you enter the identification number of the SU etc.

Select the editing tool. On the Editor Toolbar, press the 'Create new feature' button (two to the right of 'Editor'). You will need the pencil icon.

Digitise the object. By comparing the aerial photograph background on the image print with that on the screen, draw the outline of the SU or GU by clicking at each corner. When you have gone all the way round, double click to finish drawing the object. It will flash and show a blue border to show it is finished and selected. As POSIs are dots, only a single click is required.

Enter the object's ID number. While the object you have just drawn is still selected, enter its ID number into the correct field of the Attributes table. For SU, the correct field is 'SU_Number'; for GU it is 'GU_Number'; for POSIs it is 'TP_Number'. It is essential to use the prefix and all leading zeros, as listed on p. 3 of this manual: SU0034, GU0123, TP042.

Save your work. Press 'Editor' on the Editor Toolbar and select 'save edits'. Do this regularly in case of the network going down, power cuts, etc. When you have finished digitising, save your edits, save the ArcMap document, and quit *ArcGIS*.

Refinements

Correct mistakes. When you are digitising small objects, the easiest way to correct mistakes is to delete the object and start again. Select the object with the 'Edit' tool (the triangle immediately to the right of 'Editor' on the Editor Toolbar), and hit the delete key. Then select the 'Create new feature' tool and draw it again. By double-clicking on an object with the Edit tool you will show its individual vertexes (corners) which can then be moved one by one with the same tool.

Snapping. When you are digitising an object which is immediately adjacent to another object and shares a boundary, you need to 'snap' the new object to the old so there are no tiny gaps. Press 'Editor' on the Editor Toolbar and select 'Snapping'. In the 'Snapping Environment' box which appears, choose the layer you are digitising on (e.g. SU) and tick the box beside it in the 'Vertex' column. Close the Snapping Environment box. Now when you move the 'Create new feature' tool close to an already-digitised vertex (corner), the cursor will 'snap' to it to make an exact join. Digitise by clicking as normal.

Colours. You can change the display colours of SUs, GUs etc by double-clicking on the relevant colour patch in the key on the left. File/save will record these colours for the next user of your team's ArcMap document. Feel free to change them so they are easier to see and use. Usually SUs and GUs are best with a bright outline and a hollow fill so you can see the aerial photograph underneath.

Analysis. At regular intervals during the project we will export the data from the database into the GIS. For example, we join the 'SU' table in the database to the 'SU' layer in the GIS, so we can analyse pottery distribution across different SUs. This is why it is important to be absolutely consistent with the format of identification numbers (SU0034, etc). The analysis will be done by the various specialists, but team members will be able to view the results by turning on the appropriate layers in the key on the left of the screen.

Creating Image Prints

Create layout. Select View/Layout View (or press the white page icon, bottom left of the main map window). To move around the layout without changing it, use the pan tool on the Layout Toolbar (not the normal one). To move the actual map around, use the normal pan tool. To change the position of the elements on the layout, use the Select tool (arrow) on the normal toolbar. Use File/Page Setup to choose landscape orientation (for east-west transects) or portrait (north-south transects) orientation.

Turn on the grid. In the key window on the left, right-click the layer name at the top of the list, select Properties, and select the 'Grids' tab. Tick the box marked 'measured grid' to turn it on. It should already have the correct numbering style, etc. If not, press 'Properties' and fix it.

Set the scale. In the key window on the left, right-click the layer name at the top of the list, select Properties, and select the 'Data frame' tab. Choose 'Fixed scale', and enter the appropriate scale. The usual scale for SU and GU image prints is 1:2500. General maps for navigation and reference can be at 1:5000 or whatever else is useful.

Find the place. Use the normal pan tool to navigate to the right place. By moving in very small increments you can make sure the labels on the grid are at every 50 metre interval (512350) rather than inbetween (512367). Use the Select tool (arrow) on the normal toolbar to change the size and shape of the map window; the scale will stay the same.

Choose layers. Normally it is just the background aerial photograph that you need, and all other layers should be turned off (by unticking their boxes in the key window on the left). Sometimes you want to show where previously digitised SUs etc are. If so, check that they were digitised onto the same rectification of the aerial photograph that you are using (i.e. are in the right place), turn on that layer, and make them an appropriate colour (see above).

Scale, north arrow, key. Scales and north arrows are superfluous because of the grid, but may help with clarity. If you have previously digitised SUs showing, you can have a key to explain them. In each case, select 'Insert', select whatever you want to insert, and follow the wizards.

Labels. These should be there automatically, but if not, use the text tool ('T') in the drawing toolbar at bottom left to insert them:

Top left: 'Team West Image Print' (or East, etc).

Bottom left: IP No.: . Produced by: . Date: . Digitised by: . Date: . Aerial no.:
('Produced by' is usually the team leader or GI).

Print. Once everything is right, print it using normal quality.

Recording. Fill in the details on the bottom line (IP no, etc). You can get the aerial photograph number from the key window on the left of the screen. Then fill in the relevant details in the Image Print table in the Database. This must all be done as soon as you have printed the image print.

5. Maps

TÆSP owns a full set of maps produced for our area over the last 100 years, as well as many historical maps from other periods. Use the map key on the wall to locate specific areas.

1:250,000	Geology map
1:50,000	Topographical maps
1:31680	Two inches to a mile topographical map (1940s?)
1:8000/6000	1963 aerial photographs
1:5,000	Topographical maps (covering northern third of area)
1:5,000	Cadastral plans (land ownership maps)
1:1250	Village plans

The aerial photographs provide the base of our GIS, scanned and georegistered to the UTM grid (Ellipsoid: WGS 84; UTM zone: 36 N). All grid references must be given in full using the UTM grid; note that Eastings are 6-figure numbers and Northings are 7-figure numbers (e.g., 498000/3884260). We use grid North throughout, so if using a compass without a Magnetic Deviation adjustor, subtract 2º 30' from the Magnetic reading to gain Grid North. (A detailed sheet giving instructions of how to assign grid references will be available).

6. Survey Area (see map on p. 26)

The 2001 survey area was too small to investigate complete drainages and give a truly regional perspective. Simultaneously it was too large for our very intensive methodology to cover a sufficient sample of it. Our solution has been to increase the size of the overall survey area to 161 sq km, with 'intensive survey zones' within it. These currently cover 23.6 sq km (15%).

Intensive Survey Zone	sq km
Karkotis Valley	9.6
Ayios Theodhoros	1.1
Asinou Valley	2.8
Mandres	1.7
Koutraphas	5.5
Xyliatos	2.9
TOTAL	**23.6**

Rationale for choosing intensive survey zones

- They provide a representative sample (cultural, ecological, etc.) of the whole region
- The boundaries are flexible, so can be changed as we go along
- Mandres is important as it straddles a major ecological boundary; also, the seasonal settlement is relevant for our research questions, and there is pottery from a broad range of periods
- Ayios Theodhoros provides a contrast with the adjacent Karkotis Valley, and fills a gap in our topographic/geomorphologic/economic/ecological cross section of the region.

7. Field Teams

Four teams of five people each operate simultaneously in the field; each team has a car. The four Team Leaders are responsible for the overall operation of the team; the actual tasks are shared equally and in turn by all members of the team. The teams will work in particular areas (East, Central, West, with Team X working more widely throughout the whole survey area). When teams build up a particular area of expertise (e.g. archaeometallurgy, mountain-survey), they might well need to use that expertise in a different part of the survey area. In general, our strategy will remain flexible so we can respond to what we find.

In the field, as well as during the actual fieldwalking, each team member will have a specific task. Individuals should do one task for a few days, and then change. Each field task has a corresponding task in the lab: if you record data on the unit sheets in the field, then you should enter them into the data base in the lab. You must be very neat, and write carefully and legibly, on all recording forms, plastic bags, tags, etc. In practice, some tasks are more time-consuming than others: the '*equipment*' person, for example, can help with data entry; and when large quantities of pottery are collected everyone should help in washing it.

Team Leader's Duties

- deciding strategy in the field (after consultation with the Field Director), and working closely with the 'geomorphological investigators' (GIs).
- taking responsibility for the health and safety of the team.
- assuring that all team-members' time/energies are utilised well in the field and the lab. Delegate!
- making sure that field observations are recorded consistently according to the guidelines.
- preparing image prints for each day of fieldwork, in consultation with the Field Director/GIS team.
- assuring that all materials collected are recorded on data entry sheets and entered into database.
- seeing that all survey units are recorded correctly, digitised in lab and entered into database. (These last two tasks involve periodic checking and proof-reading every afternoon)
- at season's end, writing a report which gives conclusions on the areas surveyed.

Team Members' Duties (field)

1 *Navigator.* Use maps, aerial photos and image prints; draw in the units surveyed on image print.
2 *Geomorphological Intern.* Range ahead of survey team to record geomorphological units and provide information about survey unit boundaries
3 *Data recorder.* Record all field data on unit sheets or POSI sheets.
4 *Notebook-keeper.* Keep a running notebook with descriptions of units (where not recorded on the unit sheet), general interpretations of the landscape, assessments of the team's health and vigour, conversations with local farmers, and queries about methodology.
5 *Finds persion.* Sort, count, bag and label all finds.

Team members' Duties (lab)

1 *Digitising*. Once an image print has been completed, the units need to be inked in and then digitized.
2 *Geomorphology.* Geomorphological data entry and digitising. The GI is also expected to assist Jay Noller as necessary, and to help the rest of the team.
3 *Survey data*. All data from the Survey or POSI Unit forms are to be entered into database, and then checked. Initial and date the 'entered by' box on the form once done. For speed, company and accuracy, it is best for two people to do this together (e.g. team members 3 and 5).
4 *Equipment*. Each afternoon, everything must be made ready for the next morning's fieldwork, particularly bags and labels, the necessary image prints, maps and forms (Survey Unit, POSI recording, POSI unit sheets, Lithics Finds), pens, etc.

5 *Finds*. Finds from the field must be washed, rebagged when dry, and boxed after being examined by the specialists (See *Laboratory Procedures* below). Once the Pottery, Lithics, Archaeometallurgy and Other Finds forms have filled in by specialists, they need to be entered into the database, and then checked. For speed, company and accuracy, it is best for two people to do this together (e.g. team members 2 and 5).

8. Equipment

Each team:
Mobile phone, first aid kit
Spare water bottles
Digital camera for study shots of SUs, POSIs, etc (use Photograph Recording Form)
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All walkers:
Clicker (to count sherds)
Small notebook (to count tiles, slag, pithos etc. if necessary)
Water bottles (2 to 3 litres)
Small daypack/rucksack or shoulder bag (to help carry pottery)

Navigator:
Compass
Clipboard with image prints and 1:50,000 Map
Aerial photograph (in special protective cover)
Flagging tape

Data Recorder:
Clipboard with Survey Unit forms, POSI forms, blank paper
Indelible black pens

Finds Person:
Plastic bags of 3 different sizes, and labels
Indelible markers (Sharpies) for writing on bags
Indelible black pens for writing on labels
Tissue for wrapping fragile finds

Notebook-keeper:
Notebook and pen

POSI Work:
60 m tape; 30 m tape; two 3 m tapes
Pin flags
Flagging tape
String and nails (for measuring collection circles)
POSI forms, POSI Unit forms and indelible black pens
Bags, labels and indelible marker pens (for finds)

Mapping Work:
Total station
Compass
A3 drawing board, graph paper, pencils
Large circular protractor
Masking tape
60 m tape; 30 m tape; two 3 m tapes
Clipboard and paper for theodolite readings
6 inch and 3 inch nails
String, calculator, plumb bob

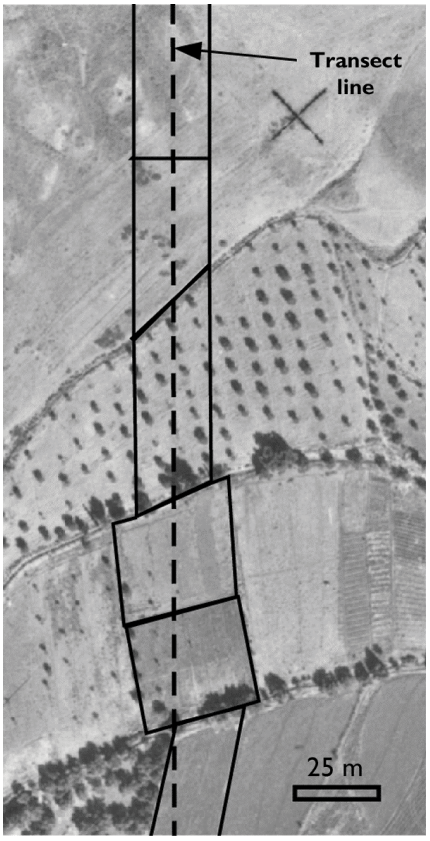
<u>For mapping work, each clipboard will contain:</u>
Copy of permit
List of forms required in the field: SU, POSI Recording, Lithic Finds (to record Ground Stone)
Codes and abbreviations used on forms
Emergency telephone numbers

9. Archaeological Field Methods (see separate document for geomorphology)

9.1 Transect Survey and Block Survey

A transect is a line of survey units, usually 20 m wide, and as long as the survey area. It gives a cross-section of past human activity in the landscape across a series of topographical changes. Normally transects run north-south, but in the Karkotis valley they run east-west to give a cross section of the valley.

Survey units in uncultivated ground are 20 m wide (4 fieldwalkers 5 m apart), and no more than 100 m long. When there are five fieldwalkers, they are 25 m wide. Where possible they should begin and end at significant topographical or geomorphological features, such as break in slope, change in sediment depth, gully, etc (see illustration). The Geomorphological Intern will range ahead of the team and bring back information and advice about where to begin and end the next unit.



Survey units in cultivated ground normally follow the boundaries of the field, because land use and soil characteristics are the same throughout, and sherds will be moved by plough action within fields but not between them. When over 50% of the field lies within the lines of the 20-metre wide survey unit, we extend the unit to include the entire field. This will require one or two fieldwalkers to walk an extra line within the survey unit. Because of the resemblance to chunks of meat on a spit, we call this the '*souvlaki*' method (see illustration). When less than 50% of the field lies within the 20-metre wide unit, we only do the normal 20 m strip. If the only surveyable ground lies to one side of the transect line, we still survey it, as long as part of it lies within 20 m of the transect line. Where conditions are particularly difficult, such as in the lower Karkotis valley, we survey the nearest visible field to the transect, upt to a limit of 50 m.

Block survey within an SIA is carried out in the same way, except that survey units are arranged contiguously across the whole area instead of in a single transect crossing the area.

To achieve a consistent intensity of coverage, fieldwalkers walk 5 m apart (and *only* 5 m apart). Each one, therefore, covers 2.5 m on each side, and the whole team covers 20 m. Record the beginning and end times of each unit in the Notebook, as a further measure of intensity.

Units are outlined on the image prints (scanned aerial photographs with UTM grid superimposed) and assigned a sequential number prefixed 'SU' (Survey Unit). The team member responsible for data recording fills in the Survey Unit Form. The Geomorphological Intern records geomorphological unit data on the GU Form. See Section 6 (Field Teams) for a detailed explanation of each team member's role.

Because varying ground conditions affect the proportion of material discovered, it is very important to record the Ground Visibility and Background Confusion systematically and consistently.

Ground Visibility is the percentage of the ground surface which can be seen through the vegetation: 10% visibility means that the vegetation obscures 90% of the surface. Each fieldwalker should estimate the visibility of their strip to the nearest 10%. The figures for the whole SU are then averaged. Round the figures up: an average of 45% becomes 50%. This means that the final formula to adjust sherd densities for ground visibility will have less effect; the default is to distort the figures less rather than more.

Background confusion is an estimate of the extent to which materials such as stones and bark resemble potsherds (specifically; not slag or lithics). When background confusion is high (on a scale of 0 to 3), fieldwalkers confuse the stones etc with sherds, so stop bending down to pick them up, and so miss actual sherds. High background confusion therefore causes an artificial drop in the sherd count.

How often do you bend down to pick up a sherd and find that it's a leaf or stone?

0 Not at all
1 Occasionally
2 Often/frequently
3 All the time (so much that you give up bending down)

Each fieldwalker should estimate the background confusion of their strip. The figures for the whole SU are then averaged. Round down: if two people have 1 and three people have 2, the overall figure for the SU will be 1. Again, this means that the final formula to adjust sherd densities for background will have less effect.

Occasionally, as teams walk, the density of material culture will increase noticeably. Call out that you are encountering **anomalous densities**, and the Team Leader will probably call an earlier end to the unit than originally intended. At the end of the unit, teams discuss what they were seeing and the Team Leader should decide whether to do further surveying. If there is clearly a wide and dense spread of artefacts, the team should describe it briefly on a POSI Reporting Form, but otherwise not survey it (as it will be surveyed more intensively by a POSI team).

Field Notebooks

These should take a mixed form both of descriptive entries and, for observations not conveniently handled on Sheets and Forms, of quantitative data. General concerns:

- These are important records; write neatly and legibly with indelible ink.
- Leave the first few pages blank so that you can create a table of contents of noteworthy observations, etc.
- Please mark each entry clearly with the unit number (in the margin), the date, and the number of the *Place of Special Interest* (*POSI*) or *Special Interest Area* (*SIA*), if appropriate.
- Record daily the timing of significant points: start, breaks, finish. Keep a running dialogue of events with times attached to them. Put in the date at the beginning of each day.
- For important items of relevance to specific specialists, put a reference to the notebook in the Comments section of the Survey Unit Form.
- Fieldwalking is more than the mechanical collection of data. The whole team is engaged in trying to interpret the landscape and its history. So talk about it, and write it down in the notebook!
- Be redundant!!!

Methods in the Mountains

Because of the poor ground visibility in the mountainous parts of the survey area, particularly in TÆSP Central, we will use a slightly altered methodology designed to cope with this, while still giving us systematic and intensive coverage. Our experiments in 2001 showed us that speed and efficiency are crucial. 'Circles in transects' were too slow and laborious to add useful amounts of data. Where visibility is below 20% because of pine needles, each fieldwalker will use a rake to clear a patch of pine needles of *ca.* 2 sq m, every 10 m along the SU. This does not need to be measured accurately – speed is much more important. This may not be directly comparable with other SUs in methodological terms, but (1) all it does is expose more surface, (2) survey is broad-brush and inaccurate anyway, and (3) conditions are so different in the forest that these SUs are probably not comparable anyway.

9.2 Special Interest Areas

Special Interest Areas are numbered in a series TS01, TS02, etc. (TS = 'TÆSP SIA'), and are usually named after the principal locality within them.

There are various reasons for designating an area as a SIA:

- when there are highly obtrusive elements of interest; for example, an ore body with ancient slag heaps and a modern mine (e.g., TS01 Skouriotissa)
- when there are several POSIs close to each other, most or all of which are apparently associated or related, and the whole area requires more general investigation
- when transecting has revealed a very wide spread of pottery, sometimes associated with structures. This particularly applies to Roman-Medieval settlements which have a surviving church
- when we decide to investigate intensively a known village (e.g., TS04 Katydhata Village).

Because each SIA varies in character, several different techniques are used to investigate them. These techniques can also, of course, be used in combination:

- *General walkover.* This can help define the edge of a major pottery scatter, discover new POSIs, and improve the understanding of the resources and topography of the area. In some cases it might be appropriate to make a contour map.

- *Investigation of individual POSIs.* Some SIAs may contain many POSIs within them, several of which need to be examined in some detail. Together, they increase our understanding of the entire area.
- *Block survey*. This is most useful for defining the spread of cultural material. Much of the pottery found on arable land consists of a broad spread of varying densities, rather than small, defined density spikes. This means that block survey is often more appropriate than defining several distinct POSIs.
- *Sample transect*. If it is not possible to block survey an entire SIA, a transect can be used, running across it or across a feature of particular interest.
- *Mapping*. This varies from maps based on the aerial photographs to new EDM surveys.
- *Geomorphological mapping*. Necessary for understanding post-depositional influences on surface material.
- Architectural survey of buildings; ethnographic work; documentary work; etc. As appropriate.

9.3 Places of Special Interest (POSIs)

The purpose of reinvestigating POSIs – both density peaks and the appearance of rare components – is to develop further our definitions and understanding of sites, settlements and other foci of human activity in the landscape, so that we may approach our higher level research questions with the appropriate units of analysis. We shall pursue different strategies depending on the nature of the POSI. Predominantly, however, what we do is attempt to collect more, better and different data concerning both artefacts and ecofacts. These data are both quantitative and qualitative.

Each POSI is given an identification number prefixed with TP ('TÆSP POSI') and a name according to the Cypriot convention of Village *Locality* (e.g., Evrykhou *Atsas*). Where there are several POSIs in the same locality, they are numbered sequentially, e.g., Ayios Epiphanios *Apatoes* 1 (TP001); Ayios Epiphanios *Apatoes* 2 (TP002). POSI numbers should not be assigned in the field, as other teams might be finding POSIs at the same time. Names are also assigned in the lab, using the 1:5000 cadastral plans.

When a POSI is first discovered, describe and summarise it on a *POSI Recording Form*. This should take 15-30 minutes, including a brief walk round to get a feel for its boundaries and character. Measurements should be paced to the nearest metre. At this stage it is appropriate to draw a quick sketch map and take a couple of photographs. (Future photographs do not need to be recorded on the POSI Recording Form, as they will appear in the POSI database automatically once entered from the Photograph Recording Form). If a GI is present, they can fill in a Geomorphological Unit form; if not, it can wait till a revisit.

The POSI Recording Form gives the necessary information for a decision to be made on how to approach the POSI. This might include EDM mapping, geomorphological mapping, measured drawing of structures or historical research, but almost always requires a more intensive collection of surface artefacts, recorded on a *POSI Unit Form*. There are three main methods of collecting material from POSIs (for Archaeometallurgical POSIs see Section 11): iron cross, gridded circles, and fixed grid.

In each case draw a careful and clear plan (sketch or measured, as appropriate), which shows the position and ID number of every square or circle, plus useful topographic features and GPS points. This should be labelled with POSI no, scale, team and date, and put in the 'Finished' tray so it can be kept in the POSI folder. Write a full account of the methodology in the notebook, and include it in the end-of-season report on the POSI.

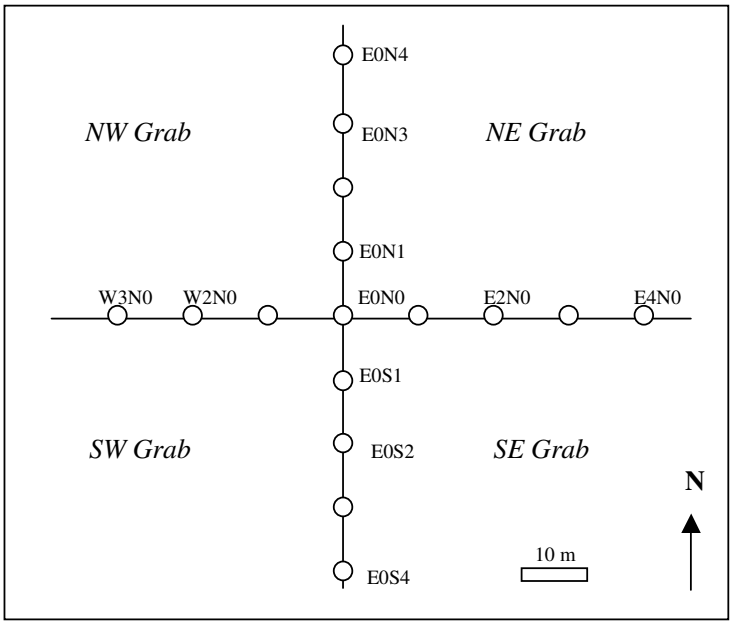
Iron Cross

This is appropriate for a distinct and discrete density spike.

- Walk around to get a feel for the boundaries of the *POSI.* You may have to make a choice at this point as to whether you have one *POSI* or several.
- Using a compass, establish North-South and East-West lines through the density peak, centred roughly on the POSI. If N-S and E-W lines are not convenient because of field boundaries or the shape of the artefact scatter, choose the most convenient.
- Using cloth tapes, flag the lines every 10 metres (or another interval, if appropriate). Extend the lines out several metres beyond the point where density drops to a level consistent with the background density.
- At each previously flagged 10-m interval, using a knotted string as compass, define a circle of 1 m radius (or another radius, if appropriate). Count all artefacts in the circle, and collect a representative sample (unless a full collection strategy has been decided). Visibility is by definition 100% and Background Confusion 0, so clear away any covering vegetation and check every potential artefact. Bag and label each circle separately and note the counts on the POSI Unit Form. Continue describing and collecting

these circles until two consecutive circles are described where density drops to a level consistent with the background density.

- The circles are labelled according to the coordinate system, as explained by following diagram, with 'E00N00' as the central circle. Eastings always come before northings. Note that there is no W0 or S0. The POSI Unit number format is **PUE05N10** (i.e. include the 'PU'; use leading zeros; no hyphens or slashes).
- For each circle collected, complete one line on the POSI Unit Form, including circle designation and numbers of finds counted, collected and bagged.
- After collecting all circles, take a grab sample in each of the four sections described by the cross. Each grab-sample should be bagged separately and described as NW, NE, etc.
- Make a map of the iron cross, with every circle and grab sample clearly marked and labelled, with north arrow and scale. Make sure to record the interval between circles and the diameter of the circle.



Gridded Circles

When an area with a high density of artefacts needs to be covered at greater intensity than with an iron cross, a regular grid of circles can be used. This is not as intensive as a complete fixed grid (see next section), but has the advantage in a POSI laden with material of reducing the amount of pottery that needs to be processed. The standard system is to lay out circles of 2 m diameter at 10 m apart (centre to centre), though this is not necessarily universally appropriate. The best orientation is usually parallel to field boundaries or natural features, though if everything else is equal a north-south alignment makes the map-drawing easier. Collection proceeds in the same way as for the iron cross; labelling works as for the Fixed grid.

Fixed Grid

It may be that some POSIs will not be gridded and collected as above, particularly very dense and concentrated lithics POSIs on relatively undisturbed surfaces. This particular technique helps to define more precisely spatial relationships between periods and/or artefact types. This is good for total collection, but less good for sampling (use Gridded Circles or Iron Cross). The investigating team grids the area on a 1 m, 2 m or 5 m square, and collects either a systematic selection or the entire area. Otherwise all observations are the same. Specific steps are:

- Establish general extent of area as above, and establish N-S and E-W lines. If it is convenient to follow the orientation of a field boundary or natural feature then do so, but assign one direction as north, even though it may actually be northwest ('local grid north'); this makes the labelling much easier. From these lines, using either triangulation or more compass work, establish the grid stretching as far as is needed.

- The grid squares are labelled using a coordinate system, as illustrated by the following diagram. Note that the easting comes first, then the northing; and that there is no W0 or S0. This system allows you to put in more squares as an afterthought, and still be able to see where they are (with sequential numbers they can be randomly scattered across the grid and very hard to find).

W4N3				**E0N3**			
				E0N2			
			W1N1	**E0N1**	E1N1		
W4N0	**W3N0**	**W2N0**	**W1N0**	**E0N0**	**E1N0**	**E2N0**	**E3N0**
		W2S1	W1S1	**E0S1**	E1S1		
W4S2		W2S2	W1S2	**E0S2**			
	W3S3		W1S3	**E0S3**			
W4S4		W2S4		**E0S4**			

- Collect assigned grids: these may be random, follow a chequerboard system, or a complete collection. The example above is essentially an Iron Cross, with the corners partially filled in and then a few outliers to sample the edges. Each grid square should be bagged separately. Follow collection, labelling and mapping procedures for *Iron Cross Method.*

Organic Units
In some cases the archaeological or topographical features will clearly dictate the shape and size of POSI units. For example, they might need to conform with structures, rubble heaps, or patches of clear ground. In this case lay them out as seems sensible, and draw them carefully onto the map. Number them sequential with PU (POSI Unit) as a prefix: PU01, PU02, etc.

9.4 Extensive Survey ('Team X')
- We have selected 20 UTM kilometre grid intersections which do not fall within or close to Intensive Survey Zones, and which are at least a kilometre south of the survey area boundary. These can be laid out on a systematic basis across the entire survey area (see map at end of document).
- Team X will walk a transect running north from each of these points. The team does an SU and GU, then misses out 100 m (noting anything of interest in the field notebook), then does another SU and GU. They do as much as they can in one day.
- This gives us a general picture of the survey area at a wider scale, while ensuring that all the new data are comparable with data from the intensive survey zones. If there are no orthorectied aerials, we record the units 'on the fly', with the GPS.

Extensive survey methodology (supplementary)
- Transcribing and if possible locating rescue excavations etc. recorded in *Bulletin de Correspondance Hellénique*, Chronique de Fouilles; *Annual Report of the Director of the Department of Antiquities*; Cyprus Survey Records (unpublished)
- Following up potential POSIs which are marked in historical maps, noted in historical documents, or known by villagers in the survey area.
- Predicting POSIs by GIS predictive modelling, geobotany, remote sensing, etc.
- Walking drainages and ridges?

9.5 Accuracy Tests

Because TÆSP collects a representative sample of the materials encountered in the field, we need to test our *Sample Transect Survey* collection methodology. Specifically, we want to know if our method of collecting material is giving us an accurate representation of what is actually encountered while field walking. There are various methods which will be used:

- Resurvey of Survey Units using the same collection method (e.g., after ploughing)
- Resurvey of Survey Units with total collection
- Resurvey of Survey Units using gridded circles
- Seeding experiments: teams survey a survey unit previously sown with sherds of known number and location. These will be done in the 2003 season, organised by Rob Schon.
- Ploughzone experiments: annual surveying of a Unit sown with a series of artificial sherds of known number and location. 556 such sherds were sown in July 2000, and are being recorded after each ploughing by Jean Humbert and Eleni Papapetrou.

10. Collection of Material

10.1 Pottery

- It is the Team Leader's general responsibility to see that all pottery is handled appropriately in the field and in the lab. One member of the team will be given the task of sorting and bagging in the field, and ensuring it is washed and processed in the Lab.
- Team members count all pottery and tile as they walk. Each team member should record these – in the case of pottery on your clicker and in the case of tile in your notebook. Do not try to rely on counting in your head: it won't work. At the end of the unit these numbers are given to the Data Recorder.
- Examples of all significantly different pieces of pottery and terracotta materials should be collected. This means that you should pick up one example of each different pottery fabric and body shape (e.g., handles, rims, bases, shoulder-neck joins, etc). We want each fieldwalker to collect a sample of material that is representative of what was encountered as s/he walked through the unit. This material is then carried to an assembly point at the end of the unit.

TÆSP 7/03
Team East
TT498000E, SU0058
25 sherds Bag 1/2

- At the assembly point, all fieldwalkers check through their pottery to make sure there are no duplicates; one team member with experience in Cypriot pottery will be available for advice. All five groups of pottery are then collected and bagged together. Labels should record 'TÆSP,' the date (month/year), the team, the Transect and Survey Unit Numbers, the number and type of artefacts, and the number of bag (as in 1/4, 2/4 meaning 'one of four,' 'two of four' bags, etc.). In addition to writing all of this information on the outside of the bag with an indelible pen, place a paper label *inside* the bag, written with indelible ink.
- It is important not to neglect either modern (even what appears to be very modern) pottery types or the range of fabrics for earlier periods (but we do not collect modern hollow brick). Bring back a sample that is representative of what you encountered in the field. This means paying attention not only to obvious characteristics of form and decoration, but also looking at fabric.

10.2 Lithics

The study of chipped stone provides a rich tapestry of information on the historical and cultural development of the island of Cyprus from initial colonization to the recent past. In particular, our understanding of the origins and development of the earliest, pre-pottery Neolithic societies on the island is dependent on the documentation of this industry. Important early sites collected in the SCSP survey highlight the potential of continuing this research within the context of the TÆSP project. Due to the continued use of chipped stone implements in threshing sledges up to the recent historical past, the record of chipped stone technology on Cyprus provides unique evidence of the island's economic and land use history. In general, recording the development of the used of chipped stone through various periods dating from the Neolithic to modern times shows changes in the organization of this technology in response to cultural change and increasing social and economic complexity, including craft specialization and raw material utilization. Prior to the invention and widespread use of metal, chipped stone provided the tools for all domestic, agricultural and industrial activities. As such this lithic industry is vital to our understanding of the major shift from stone to metal using technology.

Research during the 2001-2003 field seasons is focusing on the identification of prehistoric and historic settlements and activity areas across the survey landscape in which chipped stone materials are identified. Changes in tool type, technological organization, and raw material exploitation will be monitored and documented. Data generated from the lithic analysis will be integrated with other project information and used to map settlement history and distribution and to identify activity areas and changes in land use across the survey landscape.

In normal circumstances all chipped stone (tools, flakes, or debris) from within survey units should be counted and collected. If there are very large quantities (c. 50+), or if they seem to be *in situ* on a stable surface, fill in a POSI Form to summarise and describe the material there, and then continue the next survey unit starting on the far side of the lithics scatter. The lithics specialist will then decide how the scatter should be sampled. Small pieces of ground stone such axe heads should be collected. For larger pieces, count them and enter them on the Survey Unit form, and put in a brief description in the Comments box (e.g., 'saddle quern 30 x 20 cm'). Leave them in the field, and the lithics specialist will visit them if appropriate.

10.3 Archaeometallurgical Remains

Slag will be found in smaller or larger quantities within the survey units. All slag should be counted, unless the amount is so large that it may be necessary to designate this an archaeometallurgical POSI in which case the Achaeometallurgy team will take over. Samples should be brought back of the different types of slag represented. The sample chosen should be characteristic of the group and should be big enough to be identifiable. The different types of slag you may encounter are the following:

Tap slag is formed by letting the molten slag run out of the furnace. Because of the difference in temperatures the slag cools down rapidly and solidifies almost immediately taking the form that looks like molten lava.

Furnace slag is slag that for one reason or another has remained in the furnace. It is often coarser and does not exhibit the characteristic runners of the tap slag. It also often contains large amounts of copper which means that furnace slags are often stained with green copper carbonates. Slag dating to the earliest periods of smelting activities (EBA-MBA) will most likely be of this form as the technology was not developed enough to produce a proper tap slag. The metal is trapped in the form of round prills and was extracted by crushing.

Phorades Type Slag is a type of slag which was first discovered by the Sydney Cyprus Survey project at the site of Phorades which we now know that it dates to the beginning of the LBA. The slag was in the shape of plano-concave cakes which had an estimated diameter of 40 cm at the top and a well defined concavity at the bottom. The concavity was left behind when the solid layer of matte had been removed. We believe the slags took this shape because the total contents of the furnace were tapped into a pit that was sometimes lined with river gravels. There they were left to cool, giving the two liquid phases ample time to separate.

Furnace conglomerate consists of small fragments of ore and charcoal loosely bound together and bearing the effects of heat, but not of intense temperatures

Survey teams should also collect any fragments of furnace wall (slagged stones, slagged clay lining) as well as tuyère fragments (ceramic nozzles used to introduce air into the furnace). Coarse pottery should be given special attention as it may in fact be part of crucibles (slagged inner surface, evidence of high temperature etc) and in this case it should be collected. There is also the small possibility that you will find metallic artefacts. These should be collected and brought back to the lab.

11. Processing of Material

The TÆSP Laboratory is set up to examine, study, record and store the artefacts collected in the field. Virtually all of the chronological and functional information about the individual units is based on the examination of artefacts in the lab, so it is crucial that procedures for processing, recording and storing the objects be followed precisely and faithfully.

11.1 General

Bringing Objects from the Field

The Finds Person is responsible for checking finds into the lab each day, and thereafter assuring that they make it through all stages of the lab processing. When logging materials into the Lab, special care should be taken to assure preservation of the proper identification of the objects; otherwise their archaeological significance will be completely lost. This means that labels made in the field must be examined carefully to make sure they are clear and permanent; if there is any doubt, make new or supplementary labels. In addition, it is critical that labels be kept with the artefacts and protected from damage by water or from blowing away.

Pottery, stone, metallurgical and other objects should be treated separately and left in designated areas for examination and study by the team's specialists, who are members of the lab staff. Generally, the material should be left in the appropriate area in roughly the order in which it was collected in the field, so that it can be processed in the same order.

Washing and Preparing Materials for Study

All finds must be properly cleaned and prepared for lab study. This is the responsibility of the field team which collected them. Pottery should be washed in water and, if needed, brushed with a soft brush. Pottery with surface paint should not be brushed without explicit consultation with one of the pottery experts. Lithics should simply be rinsed in water. When the materials are washed and ready for lab study, they should be put in the appropriate place in roughly the order in which they were collected in the field.

Study and Recording of Objects in the Lab

Members of the laboratory staff and specialists will study and record the objects from the field, unit by unit. Study is based largely on comparison with other, known objects, usually from excavated sites or survey work done elsewhere on Cyprus (particularly the Sydney Cyprus Survey Project). Commonly these comparanda can be supported by reference to published examples from other projects. In addition, the project has inventories (study collections) of pottery, lithics, archaeometallurgical finds and other objects that are especially characteristic of material found in the survey area.

Storage of Artefacts

Once the artefacts have been identified and described by members of the lab staff/specialists and data entered into the database, they will be re-bagged by the designated team members. The bags will then be placed in white storage boxes, carefully labelled on the end with the following information:

- TÆSP 2001
- Material (pottery, lithics, metallurgical, etc)
- Transect/SIA/POSI unit
- Box number (e.g., 1/1, 2/4), indicating the sequence in the total number of boxes from that unit.

Artefacts selected for inventory (see below) will be removed from the rest of the material in the unit at this time; its inventory number will be written on it, and a tag left with the rest of the unit indicating that the object has been removed. Boxes should be stored according to material, in unit order, in the *apothiki* (storeroom).

11.2 Pottery Processing

Pottery Finds Form

Information about objects will be recorded on forms at the 'Finds' level; in the case of the pottery, it will be recorded on the 'Pottery Finds Forms'. This information will focus on (1) identification, characterisation and chronology of individual pieces and groups of pieces, and (2) identification of chronological periods that may be associated with individual units. The former process is primarily designed to record the identification of individual objects from units, as far as that can be determined on the basis of available information; these are the *basic data* from which conclusions about chronology, function, etc. may be drawn later.

Objects will be identified on the Pottery Finds Forms with a number made up of the unit number followed by a serial **batch** number (e.g., 1665-4 or 2066-3); objects with a given batch number in any given unit are considered essentially identical (e.g., coarse handles from the Late Roman period). An individual batch may be made up of one or more objects, depending on the objects that are brought in from any given unit in the field.

The batches are sorted into groups according to general **clay** types. Five have been distinguished so far: F/ferrous, M/mixed, SS/self slip, C/calcareous, K/kaolin. Within the clay groups the batch is designated a **function** or utility: e.g., ferrous cooking ware. This means that plain and coarse wares can be found in the same groups according to the utility.

All fragments of pottery recognizable as vessels reflect some kind of utility, and any sherd that does not belong in any of the identifiable utility groups are separated into Light and Heavy Utility. The distinction between body sherds of Light and Heavy Utility is not the coarseness of the fabric, but a fixed wall thickness of 8 mm. Other pottery finds such as loom weights go into a different group of Other Finds.
The information above and information on amount, weight, fragment type, and decoration is written down on the unit form and the batches are assigned to a chronotype. The description of **decoration** on this form is a very broad one: e.g., stamped, incised, painted, etc., or in case of the glazed wares the colour, e.g., green.

The identification of specific **chronotypes** represents a particularly helpful step in the process of studying and recording objects. These are specific types of pottery or other material that are both readily identifiable and characteristic of one particular period alone. These chronotypes, then, can be used with some certainty to suggest the presence of a chronological component for an individual unit.

Comments are not encouraged for the simple reason that any information in this category is beyond sorting in the database, and, therefore, might as well not be there. If, however, you feel there is something important that does not go in any of the other fields, then write it down.

When the lab specialist has finished studying materials for a unit, s/he will put the completed Pottery Finds Form in the relevant 'To be entered' shelf of the TÆSP Paperchase (see Section 10.6 below). The team member responsible for Finds data entry should take it from the shelf, enter it into the database, check it, date and sign the sheet to show that it has been done, and put it on the 'Finished' shelf.

The Pottery Finds Form has fields for pottery to be 'boxed', 'thrown' and 'inventoried'. These three fields should add up to the number of sherds collected from the unit. The field team which collected them is responsible for boxing them (see above); the sherds to be thrown away will be disposed of at some point by the pottery specialists; the inventoried sherds will be boxed separately.

Members of the lab staff responsible for the analysis of the objects may at times wish to confer with members of a survey team, to ask whether individual objects were *common* or *rare* in the unit, or whether there is other useful information they could provide to help in understanding the material found in the individual units. Therefore it is especially important that fieldwalkers make sure that full notes and observations on each unit are kept in their team's fieldbook.

Pottery Inventory Form

Individual artefacts that are considered potentially important (for purposes of dating, function, etc., or perhaps because they are unusual, or are especially good examples of chronotypes) may be selected for the inventory. This means that they will receive detailed description on a Pottery Inventory Form, photography, drawing and possible publication. These artefacts will be designated by an inventory number, prefixed TIP ('TÆSP Inventory – Pottery'). These numbers will be linked to the sherd's reference number, consisting of the batch number followed by a running serial (e.g., an object from Unit 1678, Batch 4 might be designated 1678.4.1).

The **fragment type** goes on both unit and inventory forms as a batch can contain more than one fragment type, as can even the individual inventory nos. if you are dealing with three fragments from the one pot.

The **thickness** is measured on the body of the fragment preferably. In the case of very uneven wall thicknesses the average thickness is calculated. Only one number can go on the form.
It is very important to specify where the **diameter** is measured. Many types of plain ware rims, for example, have similar profiles and only by diameter can you tell them apart. Most diameters are measured on the rim or base, but in other cases, e.g., a shoulder fragment, it should be obvious from the drawing. It is difficult to measure the diameter on small sherds, and it can be recorded as two numbers, e.g., 150-200 mm.

The state of **preservation** is separated into three groups: *Good* is when you have the entire surface. *Medium* you have part of the surface; and finally *Poor* where none or very little of the surface is preserved. One should be particular careful with fine wares as slips and other surface decorations are likely to be worn of on survey material.

The next 11 fields deal with the description of the fabric, the critical part. ALWAYS nip of a piece of the sherd before doing anything, but try not to ruin the profile as the illustrator will need as complete a profile as possible. The basic problem about fabric descriptions is the visibility. Even though you have a fresh fracture the distribution of inclusions within each vessel is rarely completely even, depending on how

many times that particular part was worked over. The more water applied to the surfaces the more of the clay matrix dissolves and the more inclusions will be visible on the surface. This especially applies to the difference between turned parts and handmade parts, and also handmade vessels contra turned vessels of the same clay types. NEVER ever describe the surface. At the same time one should have a good look at it since the fresh fracture most often is not very large.

Texture is an overall description of the amount of inclusions in the fabric, divided into fine, medium, and coarse. This is the traditional division of pottery (fine, plain, and coarse), but on its own it is rather useless as it only relates to function is a very general sense. For the **hardness** you scratch the sherd. If you can scratch it with a fingernail it is soft. Most Cypriot pottery of the historic period is medium, the kind you cannot scrach with a fingernail. If you need a metal nail it is hard.

The character of the **fracture** is devided into smooth, medium, and gritty. On the surface this might appear to be another way of separating the fine, medium and coarse wares, but it is more complicated, as it also relates to the character of the clay matrix. Fine fabrics are not always smooth and coarse ones not always gritty.

The **sorting** refers to the mixing of the inclusions, the size and distribution. *Poor* is when you have large and small inclusions mixed together in no apparent pattern and possibly large patches of clay matrix. *Medium* is when most of the inclusions are of the same size, but you might have some different ones and there should be no patches of clay matrix. *Good* is when the inclusions are of all the same size and evenly distributed.

We have fields for four types of inclusions in the form. Most fabrics include more, but we aim at a description of the characteristic, and there is not much point in recording one mica grain as that could be said about almost all fabrics. The inclusions that are characteristic are also the ones most common in almost all fabrics e.g. quartz and lime, and that is why the frequency, size, shape, colour, and the index of reflection is also recorded.

Frequency has been divided into four catagories: rare, sparse, common and abundant. According to the charts for estimating proportions (Munsell), Sparse is between 1-3 %, Common between 5-10% and anything above is abundant. The difference between rare and sparse relates to the problem of the limited size of a given fracture you are describing. When you look at the surface you might discover that there is a characteristic even but widely spaced distribution of e.g. large red inclusions, which would not come out in the description of the fracture, hence rare.

The range of **size** is tiny, small, medium, and large. Depending on the colour of the clay you need a magnifying glass to see tiny inclusions. If the clay is very pale and the inclusions are dark you can see them, but they look like shapeless specks. Small is when you can see them with the eye. Medium is up to 1 mm and large is anything larger than that.

The form**/roundness** is divided into round, subround and angular. Inclusions of irregular shape and rounded edge/subround are the most common ones in Cyprus, as that usually applies to e.g. quartz and lime. The **colour** of the inclusion is not a munsell code, but a short description like red or reddish brown. The index of **reflection** again is mainly concerned with quarts, but also with mica. Munsell codes are used to describe the **colour** of the exterior and interior surfaces and the matrix. In the cases where the sherds have the same colour all the way through it should be recorded in all three fields.

Another type of 'inclusions' are **voids**, which can be produced by the clay property or inclusions that burn at high temperature. Lime, for example, is affected by temperature and as it rises the lime changes colour from whitish to beige to brown. Often it simply explodes leaving a halo that can be white, beige or completely burned away and in that case it is just a ring. The field has four groups: lime, organic, both or unknown. Voids from burned away organic material can be recognized by the imprint, e.g., straws. There is room for a description of the shape of the void.

Most of the **decoration/surface treatment** comes out in the chronotype, e.g., red slip. The decoration field is meant for a short description of the details, e.g., a Sigillata bowl with floral relief decoration. If the surface is profiled that also belongs in this category, e.g., a ribbed handle or corrugated body.

Comments are not encouraged for the simple reason that any information in this category is beyond sorting in the database, and, therefore, might as well not be there. If, however, you feel there is something important that does not go in any of the other fields, then write it down.

Numbering

SU1234.25.1	Survey Unit 1234, Batch 25, No. 1
TP025.PU6.3.2	POSI TP025, POSI Unit 6, Batch 3, No. 2
TIP0056	TÆSP Inventory – Pottery, No. 56

11.3 Lithics

Lithics analysis will be carried out by the lithics specialist, using the Lithics Finds Form. When she has finished the unit, she will put the filled-in form in the 'To be entered' shelf of the TÆSP Paperchase (see Section 9.6 below). The team member responsible for Finds data entry should take the form from the shelf, enter it into the database, check it, date and sign the sheet to show that it has been done, and put it on the 'Finished' shelf. The material should be boxed, labeled, and stored in the *apothiki*. Inventoried material will similarly be entered on Lithics Inventory Forms, and team members asked to enter them into the database.

11.4 Archaeometallurgical Finds

The analysis of metals and metallurgical materials will be carried out by the archaeometallurgists, using the Archaeometallurgy Finds Form. When the unit is finished, they will put the filled-in form in the 'To be entered' shelf of the TÆSP Paperchase (see Section 10.6 below). The team member responsible for Finds data entry should take the form from the shelf, enter it into the database, check it, date and sign the sheet to show that it has been done, and put it on the 'Finished' shelf. The material should be boxed, labelled, and stored in the *apothiki*. Inventoried material will similarly be entered on Archaeometallurgy Inventory Forms, and field team members asked to enter them into the database.

11.5 Other Finds

Other finds include metal, picrolite, terracotta sculpture and figurines, stone sculpture, etc. It will be processed in the same way as the pottery, except that the Other Finds Form has an extra column for material (stone, terracotta, etc), and no columns for chronotype, etc.

11.6 Recording Forms: The TÆSP Paperchase

The quantity of data collected by the project is enormous. To record it all TÆSP has 22 paper forms, equivalent to the 22 database tables listed in Section 3. Data on the paper forms must be transferred to the database everyday. To keep track of all the paper work and to ensure that no data are lost a routine, based on previous experience, will be implemented – it requires three trays and assiduous attention to the sometimes less than glamorous task of paperwork. The trays are labeled Blank, To be Entered and Finished.

The life of a Survey Unit Form, for example, takes the following course. The team's Data Recorder will take a few forms from the 'Blank' tray for use in the field. Immediately on return from the field, she or he will put the completed forms in the 'To be entered' tray. In the afternoon, the team member responsible for entering survey data will take them from the 'To be entered' tray, enter the data onto the database, initial and date the sheets to show they have been entered, and put them into the bottom 'Finished' tray. The Field Director will take them from there to check and file them.

11.7 Daily and End-of-Season Reports

As well as the numeric and geographical collected by field teams and specialists, the project will generate large amounts of narrative commentary, tentative interpretations, and reflections of the progress of the season. These are crucial to the final outcome of the project, and can only be incorporated into our data management system by means of field notebooks (see Section 8.1 above), regular but brief daily reports, and full field reports which must be completed before departure at the end of the season. These will all go into the 'Reports' folder on the server. Last year's weekly reports turned out to be redundant, and have been discontinued. Daily reports only need to be a paragraph or two, outlining work done, basic results, and highlighting any important issues of methodology or interpretation.

Daily reports: Field teams (combined report by team leader and GI; one or two paragraphs)
Specialists (one or two paragraphs)
'Minutes' from daily summary meetings

Final reports: Field teams (combined report by team leader and GI; 3-4 pages)
Specialists & Directors (3-4 pages are suggested; these reports are essential, even if further analysis will be taking place outside the season)

12. Archaeometallurgy

Since the survey area encompasses one of the two largest mines on the island it is natural that a significant component of the field work will be to record the metallurgical activities and try to locate workshops which are related to this industry. The history of copper production on the island starts in the Early Bronze Age and continues to the Late Roman period. If we are lucky we will find sites of all these periods helping to fill in the gaps of this part of Cyprus' history, just as we started to do during SCSP. Based on our experience, we expect to find three types of metallurgical POSIs: mines, ore beneficiation sites and smelting sites (mainly large slag heaps). We will record these using the methodology we have developed at SCSP.

Apart from recording slag fragments found in survey units (see under 'Smelting' below), most archaeometallurgical analysis will be done in POSIs. Archaeometallurgical POSIs will include adits, deposits of ore beneficiation waste, concentrations of furnace materials, slag heaps, and exposed faces of slag heaps. These POSIs will be recorded as a series of 'Archaeometallurgical POSI Units' (AU), which have their equivalent recording form and database table. Typical AUs will include a layer of slag heap or ore beneficiation deposit (vertical), and a quadrant or grid square on a concentration of furnace material (horizontal). Make sure to tick the box indicating whether it is a 'Layer' or 'Quadrant'. As with the Survey Unit form, record how many of each artefact class you have counted and collected, and indicate the number of bags. Pottery other than sherds (i.e., tiles, pithos) should be identified and recorded under 'Other'.

Mines

Almost all the ancient mines in Cyprus have been destroyed by modern open cast mining methods. If we are lucky we will be able to locate some adits and galleries on the walls of the open cast. Their position will be recorded and we will try to date them if possible by associated finds or charcoal. The vicinity of the open casts should be investigated thoroughly as nearby we should expect to find beneficiation and smelting sites. The main methods here will consist of block survey round the mine, mapping all features using the aerial photograph as a base, and the mapping and sampling of specific POSIs.

Ore Beneficiation

An ore is a mixture of wanted minerals, which contain the metal, and other unwanted minerals known as gangue. Before the ore can be smelted it first goes through a series of beneficiation steps where as much of the gangue present as possible is mechanically removed. Physical remains of the ore beneficiation processes will include stone hammers and mortars used for crushing, querns used for grinding the ores, as well as, small heaps of small sized rock fragments. During SCSP we recorded two ore beneficiation areas, the first time this has been done on Cyprus.

If ore beneficiation deposits are found again the sections will be cleaned back, photographed and recorded by detailed drawings. The heap itself will be designated a POSI. Each layer will be recorded and labelled as an 'Archaeometallurgical POSI Units' (AU), and an AU filled in for each one. The components of each layer should be described in as much detail as possible, and samples will be collected from each one, both representative (most common material in the section) and random (fragments picked from the section without any prior screening). Record them on the AU form. The only way of dating ore beneficiation deposits is through pottery and charcoal found in the stratified deposits. Any such finds should be pinpointed on the section plans, noted on the AU form, and collected.

Smelting

The process of extracting a metal from its minerals is called smelting. This takes place in a furnace which is charged with alternating layers of the enriched, roasted ore, flux and fuel. A smelting furnace operates under reducing conditions and, therefore, the fuel used is charcoal. The temperatures required for this process are in the range of 1200-1300^{o} C. In order for such temperatures to be achieved, air has to be forced into the chamber using a set of bellows through ceramic pipes, tuyères, which are able to withstand these high temperatures.

Furnaces are almost never found complete, because in order to remove the metal produced, the front part of the furnace is destroyed. Furthermore, the conditions of the smelting process are such that by completion of a smelting run the furnace is in very bad shape. What one usually finds are fragments of the furnace wall. Sometimes their inner surface is covered with slag which has reacted with the clay. Fragments which preserve the curvature of the furnace are very important, as often they are the only evidence available

for the reconstruction of the dimensions of the installation. These fragments are often very friable and if found, it is advisable that they should be recorded by drawings and photographs as soon as possible.

There are two main products of the smelting process: metal and slag. Slag is a waste product which is formed by any remaining gangue minerals not removed in the beneficiation step. At these temperatures both metal and slag are in the liquid phase but since they have different specific gravities and don't mix, the two phases separate out. The slag being lighter floats on top; the copper being heavier sinks to the bottom of the furnace. At the end of the smelt a hole is opened in the walls of the furnace at the point of separation and the liquid slag is tapped out. The result is a cake of tap slag, i.e. slag which has the characteristic flow shapes on the top. Slag is a waste product of the process, and at the same time it is an extremely stable material. Therefore one always finds slag where there was metallurgical activity. The extreme end of the scale are the enormous slag heaps left behind by the industrial scale production of the Roman period. Such slag heaps are impossible to section but because the material was used for road metal the work has already been done for us by large bulldozers. All large slag heaps will be recorded by drawings and photographs and samples will be taken of all slag from the different layers as well as charcoal and pottery for dating.

Slag will be found in smaller or larger quantities within the survey units. All slag should be counted, unless the amount is so large that it may be necessary to designate this an archaeometallurgical POSI in which case the Achaeometallurgy team will take over. Survey teams should also collect any fragments of furnace wall (slagged stones, slagged clay lining) as well as tuyère fragments. Coarse pottery should be given special attention as it may in fact be part of crucibles (slagged inner surface, evidence of high temperature etc) and in this case it should be collected.

13. Architecture and Building Survey

The objective is to assess, describe and record as many traditional buildings within the Survey area as possible. Team members will fill out Building Unit forms as they inspect individual houses and buildings in each village or rural location. BU forms provide for detailed information on location, setting, materials, ownership, form and date of each building, plus a description. The team will contain people with experience in assessing and describing traditional Cypriot buildings so less experienced members will have access to assistance if and when required.

It will often be necessary to talk to the owners of buildings or to some responsible person (such as the Priest or a village official) to obtain information and, where appropriate, to request permission to enter upon private property for investigations which cannot be made from the street. It need hardly be said that team members will respect peoples' privacy, property and wishes in all such enquiries. Diplomacy, understanding and tact will be essential requirements for this work. To facilitate information-gathering and negotiations, the team will include at least one Greek-speaking member.

During the TÆSP preliminary field season in June-July 2000 it became apparent that local people contacted by members of the Architectural Survey Team were often very interested in the Project. Information provided by village residents interviewed by Architectural Team members added extra depth to the data gathered and sometimes enabled the prompt identification of significant buildings elsewhere in the area. One of the hazards of this form of information-gathering is over-consumption of coffee, cake and sugary drinks. There is a fine line between gathering useful information in the processs of accepting hospitality and spending too much time on a relatively insignificant building.

Information gathered in this way will be entered into the Database in the afternoon by members of the Architecture and Building Team. During the course of their work, team members may be shown private collections of old photographs, documents and artifacts of various which may enhance and assist the work of TÆSP. Report such finds where appropriate.

The process of recording buildings will assist in identifying those which are of exceptional interest, whether for historical or architectural reasons. Such buildings will be the subject of more detailed investigation and reporting.

14. Geobotany and Satellite Imagery

A detailed land use/land cover map for the study area was completed in the 2001 season. These data need to be georeferenced to a higher level of spatial accuracy to be compatible with the new GIS spatial baseline data. Refinements will also be made using the newly acquired ASTER satellite imagery.

Work is continuing on three sub-components from previous seasons:

- Landscape dating based upon survey of olive trees. This will be a partial landscape coverage and will contribute to the more comprehensive geomorphological analysis of the area. In conjunction with this, the field methodology for olive tree dating will be further developed – and field teams will be requested to note the locations of cut olive stumps where dendrochronology may be possible.
- Intensive botanical survey of areas on and adjoining high density finds or archaeological features, to determine whether botanical indicators exist.
- Research on the question of the amount of forest required to service the scale of smelting activities which resulted in the Skouriotissa slag and its probable distribution and management, will continue – dependent upon inputs from the archaeometallurgy team (charcoal identification).

An additional sub-component for investigation this season will be the application of satellite imagery interpretation and mapping techniques to the forest environment. In particular the ability of the imagery to identify discontinuous areas which might indicate abandoned uses (old road alignments, settlement/building sites) will be investigated.

15. Historical Archaeology

The archaeology of the recent past is an integral aspect of the landscape approach . But because there is so much material and documentary evidence pertaining to the modern and contemporary periods we need to think about what categories of data will contribute most to our understanding and, critically for TÆSP, what categories will provide information which is comparable to other survey data and amenable to presentation in a GIS format. With this in mind we have focused in on a number of areas:

1. Contributing to a detailed landuse/landcover map which gives us a detailed 'snapshot' of the shape and use of the landscape today, including environmental and ecological relationships, agricultural, industrial and other categories of contemporary landuse.
2. Historic context. We plan to develop GIS layers which present detailed demographic, landuse, ownership and control data from the Ottoman and Colonial periods. Specific SIAs and POSIs, like Skouriotissa or a watermill, will also be the subject of more detailed historical reports. Research will also contribute to the identification of particular issues and themes relevant to the interpretation of geographic regions or particular periods, resulting in historic context reports.
3. Recording. At this stage we will focus on recording five aspects of modern material culture, in addition to the architectural survey outlined above:
    1. Agricultural structures and features (changing and competing agricultural practices are of particular interest).
    2. Industrial structures and features (mining is of course a major theme of the project).
    3. Shrines and sacred or votive places: these are a feature of the Cypriot landscape and we plan to track down some of the specific meanings people have constructed around these places.
    4. Modern pottery: this will be collected by the survey teams and analysed by a modern pottery expert. This data will be linked to the wider historical archaeology research aims at a later stage of the project.
    5. Cartridges: one of the most common forms of modern material culture encountered on survey transects are these coloured plastic or paper shells left behind by hunters. Hunting is a popular pastime in Cyprus and we plan to investigate their routes and movements around the landscape, to interview hunters and to get an angle on the archaeological interpretation of this masculine bastion of cultural (?) practice.

4. Cultural mapping: this is a technique used in social and cultural planning which takes cultural information about place or landscape and presents it in a visual, geographic format. Interviews will be carried out with the people who own, live and work in the places we are studying. Our preliminary season suggests that many local people are willing to share their stories generously.

16. Photography and Drawing

All artefacts designated for the Inventories will be drawn and photographed. Some of the pottery and lithics will be drawn by the relevant specialists, but most by the Illustrators; it will all be photographed (B&W and colour slide) by the Photographer. There are both Photograph and Drawing Record Forms which must be used by illustrators and photographers. Every photograph and drawing needs to have its own number; plans and elevations of the same structure, for example, should be given separate drawing numbers. Note that 'Subject No' refers to the Number of the POSI, Unit, or Artefact. Film numbers should be taken from the Film Number assignation sheet; see p. 4.

Each team will have a digital camera for taking basic field shots for study and archive purposes. These do not need to be publication quality. It is very important that the appropriate information for these and all other photographs taken for the project is recorded on the Photograph form. Every afternoon digital photos need to be downloaded to X:/Images/Photos/D-Photos/. Because a 'digital film' can be of any size, make each one reasonably coherent (e.g. two days' survey, or a particular POSI). Each film should have its own folder. Name this 'D-xxx' (where xxx is the film number), followed by a brief descriptor: 'D-036 TS05' or D-153 Karkotis 2003'. Note that at some stage all JPEGs will be archived as TIFFs, to avoid deterioration through multiple savings.

All formal hand-drawn maps, plans and drawings, whether of artefacts, POSIs or structures, must be recorded on the Drawings Recording Form. Sketch maps of POSIs etc do not need to be recorded in this way; they just need to be labelled with ID number, date, and artist. The originals of formal drawings (both pencilled and inked) will be digitised and archived in Glasgow; photocopies will be given to all relevant specialists, and a full set kept in Cyprus.

Where drawings of pottery, BUs, etc are digitised and have a specific Subject Number (TIP0048, BU0070, etc), use the Subject Number as the filename rather than the Drawing Number. So if Drawing No. JFH-002-01 is of TIP0048, then once digitised its filename will be TIP0048.ai (rather than JFH-002-01.ai). Otherwise use the Drawing Number as the filename.

17. 2003 Fieldwork Goals

Team West	Team Central	Team East	'Extensive'
Upper Karkotis Valley	Asinou Valley	Alestos	17 X-transects
Skouriotissa	Mandres?	Koutraphas?	Mapping
Ayios Theodhoros?	Karterouni		

2003 Fieldwork goals, in order of priority (Koutraphas and Mandres depend on visibility)

Karkotis Valley

So far we have done 9 transects across the lower and central parts of the Karkotis Valley. These are of various lengths and some are rather bitty because of poor visibility. If possible we aim to fill in some gaps in these transects during the 2003 season. The main aim is to a further series of transects to the north: TT3879500N, TT3879000N, TT3878500N. This will bring us the outskirts of Korakou and Evrykhou, and mean that we will have thoroughly sampled some 6 km of the Karkotis Valley. We will also carry out more block survey at Katydhata *Laonarka* (TS09) and Katydhata *Pano Limna* (TS15), and do some more purposive investigation of Bronze Age and Medieval settlements.

Asinou Valley

So far we have done 3.5 km of transects (plus block survey). We will do 497500 and 498000 (though not necessarily for their entire lengths). This will give perhaps an additional 1.5 km, at which point we will

review our results. Hopefully the visibility will be good enough to allow continuing block survey in the valley bottom, near Asinou settlement (TS03), Ayios Ioannis (TS12) and Asinou Church (TS08)

Koutraphas

Criteria for choosing this area:

- Piedmont area with broad arable areas, otherwise only represented at Mandres, with dry agriculture; clayey soil, so water storage better than elsewhere
- Because this is a relatively water-poor area, was it only exploited at periods of broad and intensive agriculture (e.g. Late Roman, 16th century), in contrast to the Karkotis Valley, which is very well-watered and seems to have continuous exploitation from the Middle Bronze Age onwards?
- Gives us a good topographical/ecological/cultural cross-section and sample of our survey area
- Was this a major area in the east-west communications systems of different periods?

If visibility allows, Team East will do north-south transects in this area, starting from the eastern end. It may well be that this Intensive Survey Zone will have to be trimmed down at some point.

Xyliatos

The Lagoudhera Valley and Mavrovouni are now more or less finished, apart from some filling in of gaps. Most of Team East's focus in the 2003 season will be on the Alestos area immediately to the west of Mavrovouni. This includes a substantial mountain with a 20th century copper mine on top; some possibly ancient adits; and a major Roman and perhaps earlier settlement and/or cemetery.

18. Publications

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2001 A Geomorphological Approach to Reconstructing Archaeological Settlement Patterns Based on Surficial Artifact Distribution. In *Earth Sciences and Archaeology*. P. Goldberg, V. Holliday and C.R. Ferring, eds. Pp. 107-141. New York: Kluwer Academic/Plenum.

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