# Fieldwork Guidelines for Archaeology Officers

Archaeology Institute of Afghanistan (AIA)

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**LUCA M. OLIVIERI**

**Revised and enlarged edition**
**With contributions by Noor Agha Noori, Livia Alberti, Anna Filigenzi and Massimo Vidale**

Ministry of Information and Culture (MoIC)

ISMEO – The International Association for Mediterranean and Oriental Studies

Archaeology Institute of Afghanistan (AIA)


Archaeology Institute of Afghanistan (AIA)

Website: www.aia.gov.af

Facebook: Archaeology Institute of Afghanistan

Instagram: Institute of Archaeology, Twitter:

Institute of Archaeology

Email: info@aia.gov.af

Address: District#10, Qala-i-Fathullah, Madina

Bazar, Kabul

Phone: 0202202651

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# Foreword

The identities of nations and countries depend on the culture, history, beliefs, faith and religion of the people of those countries. Therefore, in order to express the identity and personality of human beings and countries, we must go to history and historians, culture and cultural figures, and knowledge and scholars of the relevant countries and people.

Therefore, to understand and document the history and culture of the country in systematic way, these *Guidelines for Archaeological Officers* has been prepared so to undertake the archaeological activities according to international standards. This book will highlight the legal aspects of archaeological work in Afghanistan, archaeological survey, planning, budgeting, restoration, conservation, protection of the excavated areas, drafting reports, and documentation related issues. The author focused on the practical and systematic vision of archaeological activities as the recent development in agricultural work, urban development and illegal digging of the sites immensely destroyed the country rich archaeological heritage.

In these pages Dr. Luca M. Olivieri shares with young archaeological officers his experience in survey, excavation, documentation, site protection, budgeting and legal frameworks. The contributor also focused on very important aspects of the practical

work and highlighted the practical example of the archaeological work in Afghanistan. Based on some best practice examples, this book plans to offer pragmatic assistance to readers, thus encouraging them to focus on the various practical aspects of a scientific archaeological fieldwork.

Dr. Anna Filigenzi, Dr. Massimo Vidale and Mrs. Livia Alberti contributed on very important aspects of the manual. Mr. Ahmadzia Nawrang, Mr. Salim Wak and Mr. Fidah Mohammad assisted in text correction and translation of Pashto and Dari languages. I sincerely appreciate the efforts of all my colleagues from AIA who assisted in composing, designing and compiling it in book form and I pray for more success.

I hope that with the publication of this valuable and extraordinary book, a service has been made to the scientific and cultural community of the country. I am sure that the Archaeological officers, students, professors and researchers in the field of archeology in Afghanistan will definitely benefit from this book.

**Noor Agha Noori**

Director
Archaeology Institute of Afghanistan (AIA)
Kabul, December 2020
Email: norafghan666@gmail.com

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The publication of this book is the result of a joint effort between the Archaeology Institute of Afghanistan (AIA) and the Italian Archaeological Mission in Afganistan of the ISMEO – The International Association for Mediterranean and Oriental Studies in the direction of offering supplementary educational tools for the training in archaeology, which may guide, assist and complement the field experiences.

The guidelines illustrated in this book bring together experiences gained over time across different fields, and tailored to fit the specific requirements of the Afghan cultural heritage. In particular, methodological and linguistic issues (including the translation of some specific archaeological terms in both Dari and Pashto) were discussed between Luca M. Olivieri – the principal author of this book – and a team of young officers of the AIA on the occasion of a training workshop held in Kabul in summer 2018. The workshop was organised by UNESCO, which we want to thank for providing such a fruitful framework for exchange. It was actually during that workshop that it was first proposed the idea of translating in both Dari and Pashto the handouts prepared by Luca M. Olivieri, to create a specific handbook for AIA archaeologists.

The readers will find in these pages a constant reference to sustainability. This is by now a global challenge, and archaeology must accept its share of

responsibility. Also, emphasis is put on the irreplaceable value of documentation, which must accompany any archaeological activity to ensure the protection of the intangible aspects of the cultural heritage.

We do hope that this book will encourage following simple but indispensable rules for a successful practice of archaeology which looks to the future: the future of the remains we unearth, and the future of the memories they encompass.

Lastly, thanks are due to the institutional support which made possible this achievement. It is a pleasure to acknowledge the contribution of the Italian Ministry of Foreign Affairs and of the MIUR/IPOCAN Project *Studies and research programmes about Asian and African cultures*, which enabled the Italian Archaeological Mission in Afghanistan, through the ISMEO, to financially cover the translation and publication costs.

**Anna Filigenzi**

Director
Italian Archaeological Mission in Afghanistan (IAMA)
Rome, December 2020
https://www.ismeo.eu/
https://www.ismeo.eu/home-english/
Email: ismeo@ismeo.eu

## 1. Introduction

This short overview, although organized in the form of a manual, is not intended to be a true handbook of excavation, restoration or archaeological survey. For those who wish to pursue the subject further will there are plenty of latest and useful contributions, many of which available for free on the Internet. The aim of the overview is to prepare the archaeology student to cope with the complex problem of organizing, planning and implementing an excavation campaign, from the initial legal context right through to the documentation of the material. All the topics will be briefly described more in the form of a summary than of an analysis. However, more detailed attention will be focused on points that are often overlooked even in the better handbooks, or that experience has indicated as being particularly important in the context of this country. In Afghanistan, as also in Italy, the archaeologist only rarely has sufficient time and funds to apply in the field the increasingly advanced technologies available to his colleagues in countries where the “cultural

heritage" emergency is not so overwhelming. Nevertheless, faced with urgent and often "emergency" archaeological work, it is possible to do good excavation work and obtain acceptable results following a clear-cut and well-defined method.

While it is true that the new technologies are transforming the archaeologist's work (take graphic and photographic documentation for example) and making it more standardized and complete, they will never replace manual excavation techniques, even when remote sensing technologies are also applied. Excavation and data interpretation remain an activity in which the human factor reigns supreme despite all its limits. The capacity to interpret evidence, as well as statistics, is what makes an archaeologist a good archaeologist and so there will always be excavations that are correctly interpreted and others that are interpreted incorrectly. What is important is that there should be good and well documented excavations. This is the aim of this course. Archaeological excavation may be likened to a non-repeatable laboratory experiment since the analysis

coincides with the excavation or with the consequent necessary destruction of the evidence, of the data themselves, or else with the decision to conserve some (unexcavated) evidence rather than other (excavated) evidence. Post hoc verification is practically always impossible and therefore and so it is essential for the entire process of analysis (or of destruction=excavation) to be carried out following a well-defined sequence of carefully planned and constantly documented phases.

## 2. The work context and the legal bases

Excavation in Afghanistan, as in all countries possessing an advanced system of legal

*Fig. 1: General view of area 045 at Mes Aynak Archaeological site*

Protection of the archaeological heritage, is above all an activity subject to legal constraints. The existing legislation is in practice easy to understand and adopts a relatively simple implementation procedure.

Any excavation activity that does not comply with existing legislation and fails to follow the rules of application may be deemed non legal. Should the intentions of the excavator clearly be to sidestep the law, the excavations would clearly be defined as “illegal excavations”.

In all countries with a rich history of settlement and culture the illegal digging phenomenon, as well as being a lucrative criminal activity, is an attack on the integrity and richness of the national heritage, whatever the outcome. The most wonderful sculptures, painted vases or coin collections, even when on display in precious showcases in a prestigious foreign museum, if the fruit of illegal digging, have already lost all historical value, represent an infringement of national and international law and impoverish the cultural heritage of the country of origin, that is, the right of every people to dispose of its

archaeological assets and to learn about its own history.

Conversely, those objects on display outside their own (archaeological, cultural) context, are a clear symptom of the economic enrichment of a small number of persons, a contribution made to the international antiquarian market, the enjoyment by a privileged part of the world population. In the final analysis these objects have a mere aesthetic value (and as such have been evaluated economically) and no historical value. Without mentioning the fact that the absence of any context also opens up the likelihood of the objects themselves not being originals.

Why “no historical value”? Because this value comes from the context, from the correlated data, and therefore from everything that can and must be documented by means of the archaeological excavation.

An illegal dig is a hole in the ground or a series of holes and tunnels, the sole aim of which is to find an object for which there is a demand on the antiquarian market or from a collector, at the same time destroying the context – that is, other objects, architecture, evidence, ultimately without

respect for anything other than the greed by which this activity is driven. Anyone who has visited an archaeological site after illegal diggers have passed through or has worked on sites having a long history of looting has felt the same frustration and bitterness as they would feel before a burnt forest, a mountain devoured by a quarry or one's home ransacked by thieves.

So far, we have considered that the illegally excavated object finally ends up "legally" in an actual museum (these long devious practices, often representing outright evasion schemes, have been accurately described by Sir Colin Renfrew). Let us now take the much more frequent case of the object ending up in a private collection. At this point the only person exploiting it will be the owner and his entourage as the object has been stolen and segregated. Sometimes however the object may be shown to an expert. This often happens for various reasons. The scholar may consider that the publication of the object partly offsets the loss of public enjoyment and therefore in publishing it in a specialized journal he is rendering a service to science and to the public at large For the

collector, except for a few enlightened exceptions, this is also a way of increasing the value of the object, often in view of its forthcoming placement on the market. While the scholar is under the impression of using the collector, in actual fact the opposite is true. The published study usually makes no mention of the place of conservation; in any case the object would not be accessible, being located in a private place. Consequently, the only images the public (composed of specialists in view of the nature of the journal) will be those published by the expert. It may be asserted that there will be no opportunity for verification. And if a measurement were incorrect? Or if the material were different? Lastly, what if the object itself were a fake? In the absence of any possible verification, the work is no longer scientific. Paradoxically anyone with a little imagination could write a detailed article on a non-existent object. There is a case on record of a journalist doing just this and getting his article accepted as it complied with all the criteria even if the data were completely invented. Most likely, in future, archaeological reviews specializing in southern Asia, like classical archaeological

journals, will start rejecting articles from the antiquarian market or from inaccessible private collections.

So far, we have touched upon issues that are more ethical than legal. Let us return to the principal theme. Before the establishment of the Archaeology department in the country many of the archaeological sites in the country were illegally excavated. Excavation in Afghanistan has been divided in to two phases; from 1823-1922 where unofficial and illegal excavation occurred in different part of the country particularly in sites of Ningrahar, Kabul, Kapisa, Begram and Bamiyan. Legal excavation started when Afghanistan signed an MoU with Archaeological Delegation of France in Afghanistan (DAFA) in 1922.

Afghanistan new law on the Protection of Cultural and Historical Properties has nine chapters and eighty-five articles published in official gazette No. 828 in 2004, a highly advanced law for the time. Article no. eight of the law mentioned that all historical and cultural properties, movable or immovable, in Afghanistan, discovered or hidden in the earth, are the property of the State by virtue

of this law, thus any kind of transfer of such property without permission is considered as a theft. Article number nine explain that the owner of land cannot take possession of historical and cultural properties unearthed or hidden in the earth, or excavate them, by the virtue of the ownership of that land.

Further mentioned in the law whenever municipalities, urban or residential building corporations, irrigation projects, and any other government or private corporations, in undertaking construction, expansion or improvement projects, come across historical and cultural properties, they are bound to stop their work and inform the Archaeology Institute. In the case that construction work endangers an archaeological property or its site, the project is suspended until a definitive solution is found for their protection. The current law on the Protection of Cultural and Historical and Cultural Properties mentions in article no. thirty four that the right of archaeological excavation is limited to the Archaeology Institute. No other government administrations, private organizations or private persons have the right to excavate, even on their

own land, without the permit, which issued for this purpose according to the provision of the law.

The Archaeology Institute can give a permit, after the approval of the Council of Ministers, to national and international academic institutions upon their application for a permit for archaeological excavation. This permit is not transferable. The organization requesting a permit to excavate should forward the application, with the following elements, to the Archaeology Institute:

1. Objective of the excavation and work program
2. Identification of the site for excavation
3. Details of the excavation team including the head of the excavation

Excavation team members cannot be changed without the prior agreement of the Institute of Archaeology. The validity of the permit is for five years; the entity requesting the permit to excavate cannot delay the excavation, without prior permission of the Institute of Archaeology, for more than one year. The period of the delay is counted in the permit period. If the excavation is delayed, due to accidents or due to the work capacity, the extension of the excavation period

is made of the basis of the new permits, according to the provisions of this law. The excavation delegation is bound to observe the laws, customs and habits of the country, particularly in the area of their excavation. The excavation team is responsible to bear the cost of property if any damages is done where the excavation is performed. The foreign excavation delegations are exempted from paying any kind of customs duties for the imports of goods and equipment used for the excavation or research purpose if unused parts would be provided to relevant Afghan Authority or either not exported from Afghanistan. The excavation should be done in the presence of Archaeology Institute staff and the Institute has the authority to investigate and supervise all archaeological excavation. Excavation should ne performed advance methods by using modern scientific instruments and the team is responsible to use necessary measures for the protection of the excavation area until the end of the permit and handing over the site to Archaeology Institute.

Ultimately an excavation (or a survey/inspection with sampling) ultimately produces three things:

(1) images and graphic data; (2) descriptive data; (3) objects. These three things must be delivered to the Archaeology Institute, who will ensure a receipt for them is issued. The results of the work are then immediately summarized in a preliminary report (printed and electronic version) to be delivered within six months to the Archaeology Institute together with (i) the inventory, (ii) a copy of any drawings, and (iii) the photos. Excavation team has the right to publish the result of the research work within three years after completion of excavations in the name of Afghanistan's historical and Cultural properties and after three years the delegation will lose their exclusive right to publication, the Archaeology Institute can also publish the report of the work mentioning name of the excavation team holding the permit. The most delicate issue is obviously that of the objects.

As we will see below the excavation finds are progressively documented as they are found together with the stratigraphic metadata (that is Sector, number of stratigraphic unit or SU, date of find). This documentation is made in the field using folders, envelopes, baskets, in the excavation log, on the laptop, etc. From all these

objects, once cleaned, the objects to be inventoried are chosen. The objects are selected for their exceptionality, state of conservation, importance, etc. For instance, all coins are inventoried but among the potsherds only those with inscriptions or that are painted are inventoried. Whole vases are included, as well as sculptures, even as fragments if they are recognizable. The inventoried objects are listed (the Inventory List) and are delivered together with the inventory to the Representative, who transfers them to the store house of Archaeology Institute and later can be transfer to appropriate museum structure. The preparation of the inventory is the most delicate phase of all the post-excavation operations. The inventory is a list containing at least the following information: (1) serial number, (2) stratigraphic metadata, (3) short description, (4) principal measures, (5) material. The following is an example:

## Mes Aynak Archaeological Site - 2018

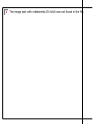
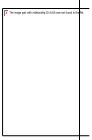
| # | Field no. | Context No | Description | Location | Square/ Room | Type/Material | Date of excavation | Photo |
|---|---|---|---|---|---|---|---|---|
| 1 | 2018.MA108.F22 | CXT#009 | Copper coin D: 18mm, T: 2mm. | From W/E: 1.48 From N/S: 1.18 | 194/132 | Copper | 01/05/2018 |  MA108 /PH001 |
| 2 | 2018.MA108.F23 | CXT#009 | Mortar stone. Length: 410mm, Wide 270mm, Thickness: 100mm | From W/E: 1.84 From N/S: 0.48 | 190/132 | Stone | 01/05/2018 |  MA108 /PH002 |

*Table 1 – Example of Inventory List.*

In a new excavation the field numbers start from the year and in the case of subsequent campaigns, even carried out years later, continue from the last serial number attributed. In the example given, the number of the first object in the trench/area excavated in 2018 is 2018.MA108.F22, as the last number of the object in the trench closed in 2017 was 2017.MA108.F21.

The field number of the object must always be preceded by a mark comprising no more than three letters representing the code name of the site being excavated. In our example, the excavation of Mes Aynak is denoted by the acronym MA. Whole site has been divided into different areas where it has been marked with a specific serial number like MA108 where MA representing the site and 108 representing the area number,

it will be the inventory that tells us whether the object comes from area 108 or 100, and so on.

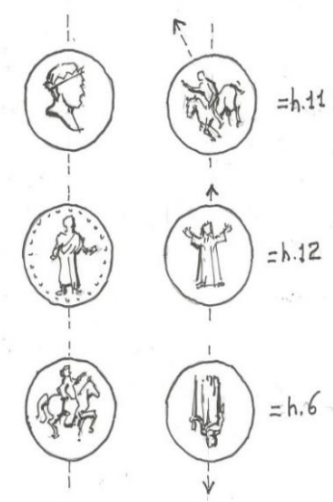



*Fig. 2: Coin obverse/reverse*

I repeat: the inventory number must be physically associated with the object. In the case of pots and terracotta or stone objects, it may actually be marked on them in Indian ink. On stone it is also possible to write using modern fine-tipped felt pens which must be avoided in the case of terracotta, which is too porous. Labeling (as this operation is called) must be performed using very small, but legible, characters on a concealed part of the artefact where however it is not exposed to wear (for instance on the inner rim of a vase, rather than on the base). Problems can be avoided by ensuring that each object has its own number written on a label attached to the object or included in an envelope together with the object. This extra work can prove invaluable

in the future and limit the problems related to identification.

For coins a slightly more complex procedure is followed as also additional information will be included in the inventory: (1) the weight, (2) the reverse and (3) the shape. As far as the weight is concerned, the use of electronic balances is not recommended as, unless they are of professional quality, they have too large a margin of error: a good jeweler's balance must be included in the excavation equipment. The sides of a coin provide extremely important evidence which unfortunately cannot be obtained from the photographic documentation: it is a matter of indicating the position of the reverse with respect to the obverse (technically called "die"). The obverse presents a figure of some kind: turning the coin around the axis of this figure, the figure on the reverse side will either lie in the same axis, be inclined or reversed. To describe this situation an analogy with the hour hand of a clock is used: in the first case (in the same axis) H 12 will be noted down, in the third case H6, etc.

The shape of the coin cannot simply be described as circular, square, etc. The wear and tear on the

coin and the irregularity of the minting means that each coin is unique. The best method is to indicate the shape by drawing by hand a continuous line around the coin on the card itself, which will then be placed with the coin in the same envelope. In this way even if for some reason the coin and its card are separated this profile will be the only way to link them together.

All nonmetallic objects may be delivered in plastic ziplock envelopes. In the case of iron artefacts this system may be used if they are completely dry. For coins it would be preferable to use paper envelopes. All the envelopes containing coins can be placed in a large ziplock envelope, taking care to remove the air (or alternatively punching holes in the envelope to avoid the accumulation of humidity).

The objects are delivered in numbered box bearing the name of the excavation, the total number of objects. For example: MA, Objects 105, Box 7, Autumn 2018. The packing of each box is done in the presence of the Representative who ticks off on a copy of the inventory all the objects packed. Care must be taken to insert inert packing material among the objects. Polystyrene

balls have been successfully tested (hopefully there won't be a fire in the storeroom!); also straw is excellent or else sheets of newspaper. Do not make too many layers and take care to pack the smaller or more fragile objects in separate baskets or boxes. Then the crate is closed, the relevant information is written large using indelible felt tip pens on at least two sides. A padlock is applied; one key is kept by the team leader and two go to the Representative. For greater security, the box should be sealed. This process is continued while the objects (and box) last. The box is then delivered together with a copy of the photos and the preliminary report. The Representative signs the delivery bill and the excavation season can then be considered as officially closed.

What is the delivery bill? The bill sets out also the terms and conditions of the delivery and the status of the objects. Until such time as the study of the objects continues, they must be accessible to the team even if the excavation has been concluded in the meantime and until their final publication. For this reason, the delivery bill contains the term "temporary custody" by

Archaeology Institute, in this case on behalf of the organization or team holding the permit.

If the organization holding the permit needs the objects for the purpose of research, conservation or analysis beyond the closing of excavation season it can send official request to Archaeology Institute where the Archaeology Institute can provide permission after the decision of the Archaeology Committee and approval by the Minister of Information and Culture but all discovered movable properties are to be delivered to the Archaeology Institute before the end of the permit. The excavation team cannot transfer the objects from excavated areas without the permission of the Archaeology Institute. All properties that are discovered during the survey and excavation belong to the Government of Afghanistan.

*Fig. 3: Excavation in Progress at Mes Aynak site*

## 3. Before excavation: the survey

It is good practice to make a thorough inspection of the area in which the excavation site is located. There is one important aspect that the researcher must bear in mind in order not to overestimate the results of the reconnaissance. In archaeology it is deemed of fundamental importance to be able to cross-reference the horizontal observation (survey) with the vertical observation (excavation). The survey produces a set of data that is more undifferentiated in chronological and evaluative terms. For instance, it is possible to overestimate one site owing to its better state of conservation and on the contrary underestimate

the size of another owing to the poor surface conditions. In chronological terms there is a risk of constructing data associations that will not be confirmed later. On the other hand, the excavation is able to produce a more certain chronological sequence which however, owing to the smaller area involved can give rise to other errors of assessment. Of course, the diagnostic reliability is greater when the two processes (horizontal and vertical) are carried out together or in sequence; the greatest reliability (100%) will be achieved in the physical point in which the two processes intersect and will gradually decline the further apart they move. In any case, the two processes, if carried out together, can provide data that can be used to make a three-dimensional reconstruction of the historical reality of the area. The survey can be carried out in many ways depending on the objectives pursued and the forces available in the field. The importance of the literary sources and toponomastic should not be under evaluated for the understanding of the territory. E. Morigi, briefly discussed five different survey techniques:

### 3.1 Transect survey

This duplicates the conventional surveying technique in which one or more persons move over a part of the ground counting and defining the presence of outcropping archaeological material. The space is thus divided up into parallel strips about two meters wide and of the same length as the surface to be surveyed.

This is certainly the most effective and complete method and the one providing the greatest quantity of information as a function also of the intensity and repetitively of the operation. The drawback is that it demands a heavy investment in terms of time and labor as well as an accurate assessment of the areas surveyed.

Visibility is decisive for a correct assessment of sampling as the presence of vegetation or crops causes a progressive reduction and thus also a reduction in the possibility of detecting archaeological remains, until a threshold is reached beyond which it is impossible to identify even monumental remains. Consequently, the choice of the season in which to perform the sampling has a considerable effect on the results

(after the harvest or before fresh ploughing, preferably after heavy rain).

This technique has been used on all land free of vegetation or crops and with natural flat surfaces, either slightly sloping (max ca 20°) or with artificial terracing. This is because of the difficulty involved in performing transect surveys on steeper slopes and also because in such circumstances the archaeological record tends to be concentrated downhill under the effect of rainfall and earth slips. Also, all the areas with monumental archaeological remains were explored thoroughly using the transect survey so as to gather as much information as possible relating to the site's function.

The use of the transect technique has no effect on the discovery of monumental remains.

### 3.2 Contour technique

To solve the problem of taking samples along steeper hillsides (min 20°- max 50° ca), a contour exploratory technique was preferred: the method consists in travelling over hillsides maintaining a constant level and continuing horizontally at the

prescribed level. Of course, the presence of natural obstacles sometimes means that the same level cannot be maintained. A zig-zag trajectory is followed inside a strip lying between two relatively closely spaced levels which could vary by up to a few dozen metres. Also in this case the presence of two or more team members made it possible to subdivide the space into survey bands situated on several different levels and to simultaneously explore several parallel areas.

This technique is effective only in the case of archaeological evidence of a monumental nature but has appropriately been combined with the transect technique on any section of land that would allow it, such as flat or terraced areas.

On very steep slopes the remains of fragmentary material usually tend to roll downhill until stopped by less inclined areas or against irremovable obstacles encountered on the way. After a large concentration of material was found that could be assigned to a site it thus became necessary to assess the existence of a possible non primary deposit of the remains and to identify the line of fall of the material.

The advantages of the contour technique consist of the systematic nature of the method and its reliability vis-à-vis the monumental remains present over the whole surface. Its limits consist of excessive steepness of the hillsides or heavy vegetation making some of the areas impassable and monumental archaeological remains invisible.

### 3.3 Pathway technique

By following the traditional lines of communication crisscrossing the hillsides forming the valleys it was possible to identify many of the catalogued archaeological sites. The roads, paths, passes and dry stream beds or riverbanks represent lines of communication that have remained unchanged for centuries. Nowadays they allow the local inhabitants to reach their homes, the small villages, the mountain tops and clean water sources just as they were used for similar purposes in the past. The general configuration of the territory has remained almost intact in spite of the succession of different cultures and societies.

This survey technique allowed the implementation of the work to be speeded up. In the space of a single day it was possible to cross whole valleys, encountering without too much effort (except perhaps physical) a succession of archaeological remains. Also in this case, however, the technique proved effective only in indicating monumental evidence. Also in this case it was possible to combine it with the transect technique in relatively flat areas free of heavy vegetation so as to detect the presence or ascertain the absence of non-monumental sites.
The use of the pathway technique proved to be extremely selective as there was no certainty that the present-day pathway completely follows the lines of communication of the past.

### 3.4 Local guidance

A fundamental contribution was made by the local inhabitants who, after lengthy conversations, often accompanied by tea and food prepared on the spot, led us to remains in the area that were completely unknown to us or to areas now lacking historical evidence but which until only a few

years before bore obvious traces of archaeological remains.

As far as the areas now lacking evident archaeological traces are concerned, it was endeavored to exploit the information conveyed to us by carefully inspecting the area with a view to finding diagnostic elements of use in confirming the datum. In some cases the inhabitants led us to an area in which important terracing work had been carried out which had left only a few traces of a zone of archaeological interest.

The drawbacks of this technique are due mainly to the fact they lack a systematic approach and control. Furthermore, there is a risk of the unreliability of the information or the informers, and in certain cases we suspected that the inhabitants amused themselves by sending us to places having no ruins and that were difficult to reach, and due to the repetitive nature of certain indications, that very often were a mere repetition of what we had already recorded. This technique proved quite effective in identifying rock paintings.

### 3.5 Probabilistic technique

This is a type of nonsystematic survey aimed at exploring points on the landscape considered to be promising. This technique was used only rarely and specifically in several of those areas considered as marginal or inaccessible using the survey techniques described above.

Slopes that are too steep (exceeding 50°) and inaccessible to normal human traffic may conserve sacred symbols such as rock reliefs or paintings which express their function and identity in such zones. We often ventured along rugged and difficult terrains. Our persistence was sometimes thwarted and sometimes rewarded.

Methodologically speaking, although this technique lacks planning and systematic implementation, it allows some light to be shed on areas that would otherwise remain concealed.

The following table presents a short summary on the main and most effective survey techniques

| Survey Technique | Survey zones | Advantages | Disadvantages |
|---|---|---|---|
| INTENSIVE TRANSECTS | Flat or gently sloping area (gradient < 20°) | • Complete and detailed | • Very slow<br>• Useless for monumental evidence<br>• Strongly conditioned by visibility<br>• Possible only on gentle slopes (< 20°) |
| PATHWAY | Roads, paths, mountain passes, dry river beds, river banks | • Relatively fast<br>• Combined with intensive transect survey | • Selective<br>• Effective only for monumental evidence |
| CONTOUR | Hilly areas with steep sides (gradient between 20°-50°) | • Systematic<br>• Complete<br>• Combined with intensive transect survey | • Affected by environmental obstacles and ground morphology<br>• Effective only for monumental evidence |
| LOCAL GUIDANCE | - | • Fast<br>• Provides information on pre-existing state | • Unsystematic<br>• Lack of control<br>• Can be repetitive |
| PROBABILISTIC | E.g. marginal and relatively inaccessible areas | • Fast<br>• Refers to relatively inaccessible areas | • Unsystematic<br>• Effective only for monumental evidence |

*Table 2 – Main survey techniques*

### 3.6 Environment of survey

In any case, whatever the system or method chosen, the lowest common denominator of a good survey resides in having a research basin that is at least defined in abstract. A valley, defined as lying between its watersheds, its head and its mouth, is a coherent basin. An area of 25 sq. km. carved out of a plainland is much less so. In this case it may be decided to survey an area having a given radius with the centre represented by the site it is intended to excavate, or else an area corresponding to a modern administrative unit (a tahsil, for example). In any case the choice of area must be based on a clear perception.

### 3.7 Survey materials

After defining the area, some basic maps must be procured, together with a minimum number of instruments and a survey form. I would always in any case always add a notebook in which to record one's first observations, even at the risk that this will gradually replace the survey form. It will in any case represent an essential tool as we

shall see later with the excavation log. It is not always possible to use a GPS, and indeed this is often explicitly banned in the excavation permit. This is the fundamental reason why good maps are necessary.

The available maps in Afghanistan are of excellent quality and definition and have high toponomastic reliability. The second reason is that using them makes us familiar with the terrain, the place names, the orography, etc. Of course, if one has both a GPS and a digital map it is very convenient to immediately download the data onto the digital support: the simplicity of this operation exposes us to the risk of foregoing a more interactive and mediated knowledge. This is one of the secrets of the archaeologist's work, namely to obtain a three-dimensional view of reality, a view that is essential for any interpretation of the excavation which takes place precisely as the three-dimensional content (reality) is concealed from our eyes by the excavation.

Another secret is not to carry out a survey seeking what you already know. In excavations this is hardly ever successful: you usually find what you

were not looking for. If you travel over the countryside looking, for example, for black pottery, you will certainly miss other information.

Your backpack should always contain a pair of binoculars, a compass, a measuring tape and scale for photographs. Take with you at least one square metre of transparent plastic (polythene), of the type used by farmers for greenhouses, available in all rural market places, as well as a set of indelible marker pens and a roll of tape, like that used by panel-beaters. If you need to document rock art, paintings, carvings, etc. use this tape and arm yourself with patience, you have to trace everything. Every now and then give your eyes a rest and lift up the sheet to get an overview and then start again. Never photograph these artefacts after making plaster casts of them or, if you do so for the purpose of your study documentation, and then cancel it all out. Please never use these photos for the purpose of publication! The polythene sheets which you will have carefully marked with the site name and number, if hung up against white walls with a measuring stake may be photographed and

reduced to scale on the computer to A4 format and polished.

A number! This is an important point. Each identified site must have its own number as though it were an object. Give your survey a code and each site a number. For instance, AIA.01.14.024, where AIA is the abbreviation for Archaeology Institute of Afghanistan, 01 is the province number, 14 is district number and 024 is the site number followed by 025, etc. (three figures are enough as we assume you will not have more than 999 sites per district). The following year the number of sites will continue from AIA.01.14.025. Remember a basic fact: both in the survey, in the excavation and in the inventories, the numbers are identifying names; they are assigned in serial fashion but do not have to be progressive; it is possible to have a series

such as 5, 6, 8, 11, 12, 13, in which 7, 9, 10 have not been assigned or have been eliminated.

*Fig. 4: Excavation at Top Dara stupa*

## 4. Preparing the excavation: budget and equipment

An archaeological excavation is an activity that involves numerous persons and lasts quite a long time – from a season lasting two months to several seasons. The persons involved may be divided into the following groups: scientific team, workmen, technical and logistic support staff.

An excavation must therefore be carefully planned. An important part of the planning is

related to costs. Each budget, when drawn up properly and reflecting a detailed analysis of the real needs or costs, is both an operational work plan (OWP), that is, it reflects the activities planned to be carried out and their distribution over time and at the same time every reliable OWP is also a reliable time plan or TP.

In conclusion, whenever the scientific objectives of the excavation are clear-cut and the expected results specified, the scientific team can draw up the two basic documents needed for a correct governance and planning of the work, namely the budget and the OWP-TP.

Costs can be divided up into the following items:

| No. | Budget unit | sub-units | | | OWP activity |
|---|---|---|---|---|---|
| 1 | scientific team (per day) | allowance | boarding | lodging | A |
| 2 | representative (per day) | allowance | boarding | lodging | A |
| 3 | lodging | | | | A |
| 4 | mobility | car rental | fuel | repairs | A |
| 5 | workmen (per day) | allowance | final premium | | A |
| 6 | equipment | | | | A |
| 7 | restoration work/materials | | | | B, C |
| 8 | test laboratory | | | | D |
| 9 | logistic staff (per month) | driver | administrator | watchmen | A, B |
| 10 | land leasing | | | | C |
| 11 | publication costs | | | | D |

*Table 3 – Example of an Operational Workplan*

According to our OWP, the first activity to be addressed is the leasing of the land. Only rarely does an archaeologist find himself working on land belonging to the government unless he is working on a site already acquired and usually largely excavated. Only rarely is the land untilled. Except in these fortunate circumstances, the land

consists of private property and represents an economic asset or an important sign of social prestige for the owner's family. Having identified the site and its approximate size (including the service area, and the area for soil dumping, access, parking and the hut for the tools and watchmen) an economic agreement has to be negotiated with the owner. Let us assume we have reached such an agreement, that there are no exclusions and that the cost is covered by the available budget (a hypothesis that must be verified months beforehand). The agreement must be drawn up on legal paper and deposited at the nearest law court (an operation that costs a few hundred rupees). It is good practice for the agreement to include a tacit renewal option and to cover an area at least twice the size of that which it is intended to excavate. The excavation always reserves some surprises (this is the good side of the archaeologist's work) and it is not possible to know in advance the extent and the length of time the excavation will have to be extended. Moreover, a lot of space around it will be required, as mentioned above.

| OWP activity | Budget unit | Description | Months | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| A | 1 | survey | | | | | | | | | |
| | 1 | excavation | | | | | | | | | |
| | 2 | | | | | | | | | | |
| | 3 | | | | | | | | | | |
| | 4 | | | | | | | | | | |
| | 5 | | | | | | | | | | |
| | 6 | | | | | | | | | | |
| | 9 | | | | | | | | | | |
| B | 7 | restoration | | | | | | | | | |
| C | 10 | site management | | | | | | | | | |
| D | 8 | study | | | | | | | | | |
| | 11 | publication | | | | | | | | | |

*Table 4 – Example of a Time Plan*

The workmen are usually hired from among the labourers and farmhands working on the same land that has been rented or in any case are drawn from the local village; the watchmen, who may also be workmen, are often relatives of the owner. These two stratagems facilitate negotiations with the owner for obvious reasons of a return on his asset but will also be useful to you as they facilitate the process of fidelization

through work which must always be obtained as far as the local community is concerned also with regard to the protection of the site. It is a good idea to negotiate pay with the owner and, in any case, it should never be much in excess of the local daily pay offered to farm workers. This will head off any conflicts and/or claims that could jeopardize the work. The agreed conditions must satisfy everyone. It is also necessary to ensure that the daily working hours on site do not exceed six hours to avoid loss of concentration and data, while the farm labourer normally works 8 to 10 hours per day.

The equipment required for the excavation must include the following

1) picks (one for each two workmen)
2) long-handled shovels (one for each two workmen)
3) wheel-barrows (one for each two workmen)
4) small picks (one for each two workmen)
5) large trowels (one for each two workmen)
6) small trowels (one for each two workmen)
7) baskets (start of with 100 baskets per 10 workmen)
8) large and small brushes
9) ladders (at least two)

10) Plastic bags of various sizes, aluminium foil, tape, felt-tipped pens.

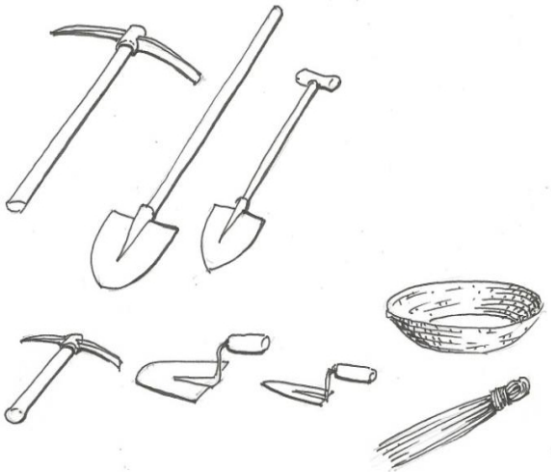


*Fig. 5: Excavation tools picks, shovels*
*Large and small trowels, basket, and brush*

11) labels to be wired to the baskets (and wire precut into approximately 15 cm lengths)

12) Sieves

The wicker basket is an essential tool that has three uses: to take away the soil and smaller stones (also using a line of workmen – one every 1.50 metres, also standingon ladders: the baskets are actually light and do not add much weight), to collect archaeological material and to store the washed material in the storerooms.

In addition to this material, we have wooden planks to allow the wheelbarrows and workmen to avoid passing over the excavated areas or recently cleaned layers: every effort must be made to avoid contamination and always to work tidily!

All this equipment is available on the market in every large rural center. In some cases, small-size picks and trowels may be hard to find. It is possible to find a blacksmith who can make them or modify them in accordance with the model proposed on the page opposite. In any case every two-three weeks, in rotation, the material needs to be sharpened by the blacksmith (the cost of this must be budgeted for in the equipment cost section). A good number of handles should always be kept in reserve.

The plastic bags (the ziplock type is ideal) and a couple of rolls of aluminum foil can be used to collect the more delicate samples and finds; the cards are used to label the baskets of material; the felt-tip pens and copying pencils (which do not fade even when exposed to sun and rain) are used respectively to mark the envelopes and the labelling cards.

The equipment of the scientific team must include:

1) optical level and stadia
2) site ranging rods (at least 10)
3) 50 mt measuring tape
4) 2 20 mt measuring tapes
5) 3-5 10 mt measuring tapes or an equivalent number of folding rulers
6) plumb line
7) blackboard and chalk
8) metric scale and North pointer
9) nails and pickets (respectively 100, large, and 20-50: obtained by cutting reinforced concrete rods into 80 cm segments)
10) heavy duty building site string
11) compass
12) 2 bubble levels
13) A square frame with a 20 cm grid, for graphic designer's documentation

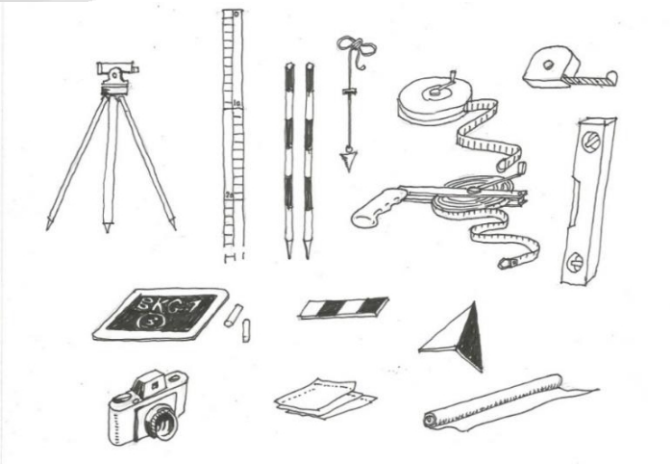


*Fig. 6- Equipment's: optical level, stadia, rods, plumb line, measuring tapes, bubble level, etc.*

Of course, each team member will have a large trowel, a small one, a small pick, his excavation log, pencil, pen, ruler, eraser and pencil sharpener (as at school), as well as his own camera.

It is important for the excavation photos, which are shot on one or more cameras, to be downloaded daily into the computer and stored in dated folders. A backup copy must be made without deleting them from the computer memory. For the purpose of publication, it could prove useful to record the name of the person who took the

various photos. If required, keep separate folders inside the daily folder. The photos may be marked with the author's initials (as in column one of the inventories reproduced above) and a serial number running till the end of the excavation.

Before ending this short chapter, a few words about the motor vehicle. The most suitable excavation vehicle is a double-cabin 4WD pick-up: this vehicle can accommodate up to six persons plus the driver and the platform can be used to transport a load of baskets from the excavation. Returning to our lodgings: we need a room, possibly on the ground floor, with an outside space and a storeroom. These spaces will be used for the various operations of cleaning, cataloguing and restoration which cannot be performed in a hotel or an apartment. These requirements need to be taken into account when (in advance) we are seeking suitable lodgings for our team.

## 5. Beginning the excavation: laying out the trench

As we have seen, a portion of land is selected which is larger than we have initially decided to

excavate. The next decision is to select the area to excavate, the desposit area, the discharge area and the access area. The deposit area is normally located before the excavation area and the discharge area after it. This establishes a sense of order for those doing the work, which has quite an important influence on the way the work is carried out on the site.

The first operation is to fence off the leased area: the excavation is a place of work that is both delicate and dangerous and it is certainly desirable to avoid accidents. This could involve having to pay for a lame cow but also seeing a freshly excavated 2nd millennium occupation level ruined by holes dug by stray dogs. After fencing off the area an access path to the discharge area is set out. It must be wide enough to allow the two-way passage of wheelbarrows, which will be full in one direction and empty in the other.

The third operation to be performed (we have already hired a number of workmen, let us say one quarter of the total) is to build a hut for storing the tools and as a shelter for the watchmen. At the

beginning two watchmen will be enough although three will ultimately be the minimum number to ensure a proper rota system. You have to decide whether to hire the watchmen from among the workmen or else from among the older farm labourers of the owner. In any case it is good practice to agree upon their names with the owner and that those selected should live in the vicinity of the excavation. This will make everything simpler.

Local practices should be followed for making the enclosure and the minor constructions. You should try to discover those among your workmen, all expert labourers, who are more skillful masons. This will be taken into account when you form the working teams later on.

Having defined these spaces, the trench must now be laid out: it is traced and staked out and the datum level set. Then the entire surface is surveyed and mapped. In short, the plan of level (1) is made = surface.

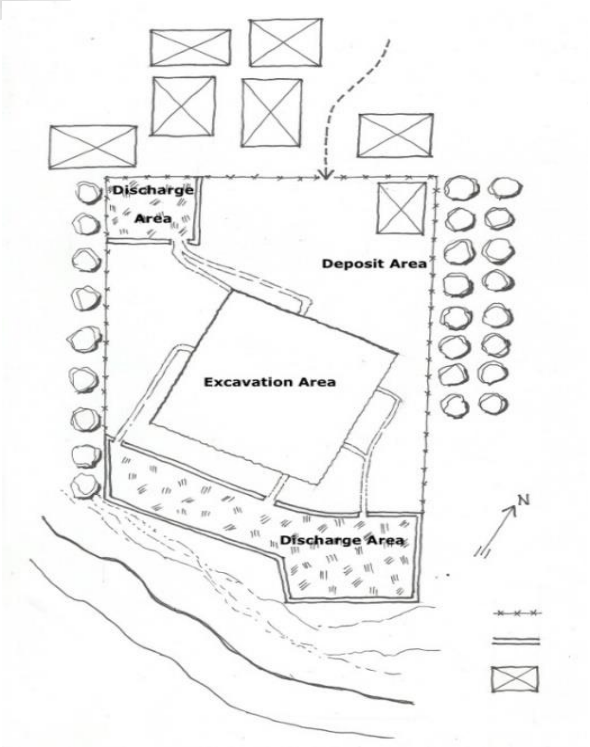



*Fig. 7: Layout of an Ideal excavation area*

In setting the trench limits it is necessary to keep a proper distance from the deposit and discharge areas equal to at least one tenth of the maximum trench size. Mark out an excavation area that is as large as possible. If possible, avoid long narrow trenches, which are however ideal for exploring an internal-external situation, for

instance across the walls of a fortified site. The wider the trench the clearer its stratigraphy will be. Many archaeologists have a sense of security is narrow spaces but this is an illusion. Imagine a manuscript or the page of a book. Imagine that your study of that page is limited by a strip running across the entire page. What would you be able to understand it?

However, this is a matter of choice.

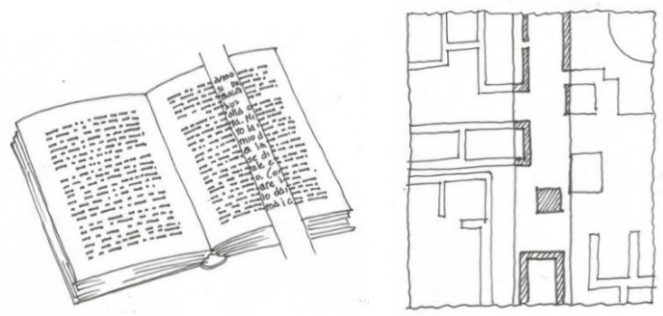


*Fig. 8 – Narrow trench vs. wide trench*

Our methodological approach follows the modern stratigraphic excavation model and considers the grid system to have been superseded. This will be illustrated below. In any case it is fundamentally important for our trench or excavation area to be perfectly delimited, aligned with the North, if

possible with equal side lengths that can easily be subdivided. Between having a trench measuring 17x15 m and one measuring 16 x14 m or 18x16 m there is apparently not much difference. At the practical level, however, there is a big difference. A trench can be orientated any way you want. However, if possible orientate it towards the North and you will facilitate the observation, description and graphic representation of any structure or artefact.

To delimit the area, start from the highest point and position the optical level on its tripod with the centre of the instrument perpendicular over the point you have chosen as your datum point which we shall call point A.

This point is marked permanently with a stake cemented into the ground. Previously the archaeologist would have used a simple instrument, the surveyor's compass, which nowadays has been replaced by the optical level. From point A, turning the knob on the instrument, take a sighting on point B in the same alignment. How is this alignment found? How is the knob used? You have a compass and are standing on point A, take a sighting, in a W direction, for

instance. Turn the head of the instrument in that direction. Place the compass on the head of the instrument in alignment with the sighting and move the head until it is aimed towards the W: a precision of degree seconds is not required: this is an operation that corrects itself as you proceed. Now use your thumb to turn the horizontal circle rotation ring under the head of the instrument until it displays 0°. Fix it in this position: when you then turn the head of the instrument towards the S (check using the compass); the notch of the instrument head should indicate 90°. With the instrument on point A you can also take the height: very simply (and empirically) this is the height of the instrument above the point. From where to where? From half way along the telescope to the ground surface: this will be the **height of the level** that will be used for the other levels throughout the day.

Let us go back to the W alignment. If you have decided to dig a 10x10 m trench (rather small for my tastes but this is only an example), your colleagues will position the stakes or the rods on

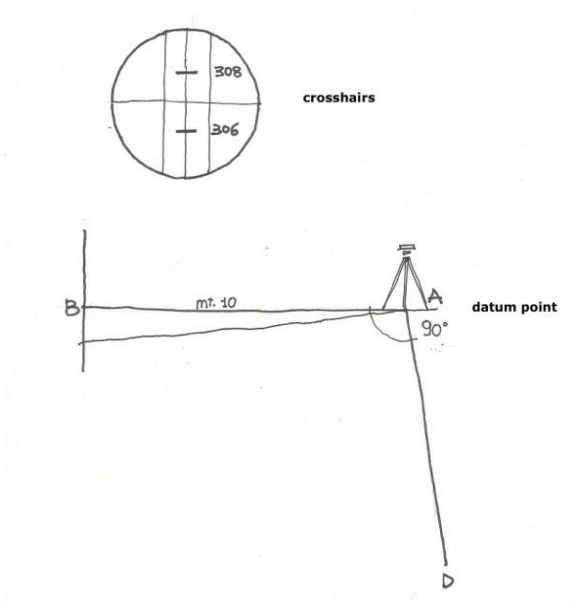



*Fig. 9: The optical level and its crosshairs*

the alignment read off with the instrument and others will pull the measuring tape from 0.00=point A to 10.00=point B. It is important for the tape to be horizontal, which can be checked using a building site bubble level. If you also want to check also the difference reading off in the lens the difference between the reading marked by the

upper mark and that of the lower mark of the crosshairs: after that multiply by 100 and add a constant of 10 cm (example: upper line reading: 2.35; lower line reading 2.05 = difference 0.30x100= 30m+10 cm=30,1 m). After finding the point B, position the rod and survey it: that is, using the instrument read off the difference in level between B and A, which will be negative because, as we know, point A is higher

(The details of this operation will be illustrated later). After fixing point B, then turn the instrument 90° in an S direction and using the same system fix and survey point D. Then, in order to fix point C you have two options. Option one: move the whole instrument with its tripod from A to B, take a sighting on A in order to set the knob on 0° and then shift by 90° in order to define C. However, in order to survey it it is necessary to take into consideration the relative value of the point on which you are standing (this will become clearer later).

Option two, which is more empirical but geometrically correct and to be used if you have three measuring tapes and your trench is square

(if it is rectangular the formula is more complex). You find the diagonal AC as AB is 10 m=10x1.41=14.1. Two members of the team will measure 10 m from B in the direction of C, two others from D towards C, two will measure 14.1 m from A towards C. The point at which the tapes of the three measures cross will without doubt be point C. At this point, having fixed the stake, you can directly survey from point zero, that is, from A.

Confirmation of the orthogonality of the four points A, B, C and D can be obtained rapidly by means

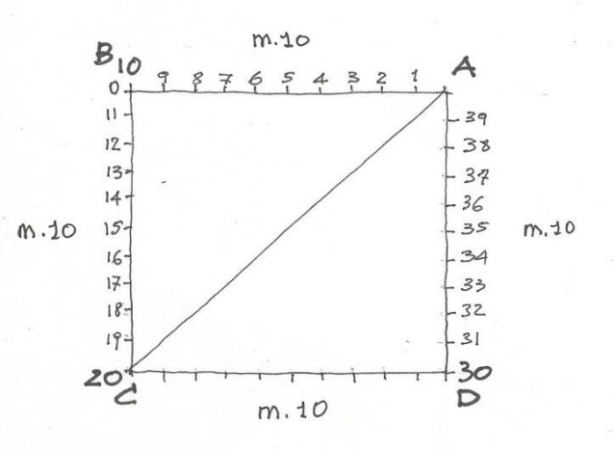



*Fig. 10 – Measured grid of an excavation areas*

of two options. The first is trickier: the instrument must be moved from

A to B and the knob set to 0°, sight A, then turn the instrument and sight C: the knob should display 90°; repeat the operation from D, taking a sighting on C and then A. A final note on the knob. Many instruments (for example those of the Nikon) have a rotation ring divided not into 360° but into 400° (centesimal degrees or gons): in this case the right angle (B-A-D, C-B-A, etc.) will have a value of 100° and not 90°. The second option is geometric: measure the diagonals. If necessary, shift the stakes (but not A) until the total approximation is acceptable (out of 10 m. I would say 5 cm: sometimes an underground stone is enough to shift a stake you are driving in by 2-3 cm). Once you are certain cement also the other three stakes (B, C and D). After this drive in the intermediate stakes (long nails will do the job) at a distance of 1 m on each side. In this way on the planimetric sketch you make on 1:50 scale millimetric graph paper (1 metre=٢ cm) a square having a side length of 20 cm subdivided into 10 marks per side every 2 cm, marked out as follows:

A1 (=datum point), A2, A3, A4, etc., B1 (=B), B2, B3, etc. now the area is ready for the first operation: the surveying of the points along the side and the surface of the layer (1). Start from the sides or the profile.

Taking the elevations is a simple operation which only needs a bit of practice. Learn how to do it properly as you will have to repeat it several times a day; it is the basic operation in the documentation of the excavation.

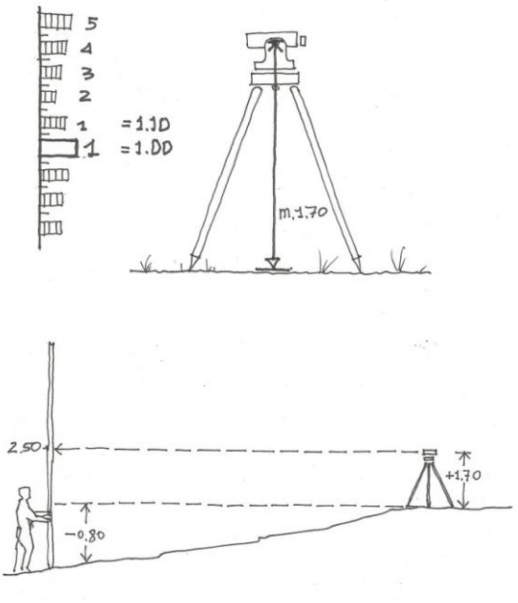



*Fig. 11 – Surveying process: how to read the stadia*

Set the instrument up on point A (the datum point). Instrument on tripod, at right angles to the to the plane of the point underneath (bubble level). To verify the level, turn the head of the instrument in various directions and check the bubble. If necessary, make any necessary adjustment using the three levelling screws at the base of the head. The height of the instrument can be taken from the base of the point to the middle of the telescope tube (the best way in my experience): if it is not marked, mark it yourself with the indelible felt-tip pen and use it always. As we have seen this will be the daily reading which you will enter in the excavation log. On this day the instrument stands +1.70 m with respect to point A (datum point, which has a relative height of +0.00 m).

Find a workman to train in this activity (this is an excellent opportunity: always view the excavation as a training experience); he will be the one who will learn to level the instrument every morning as

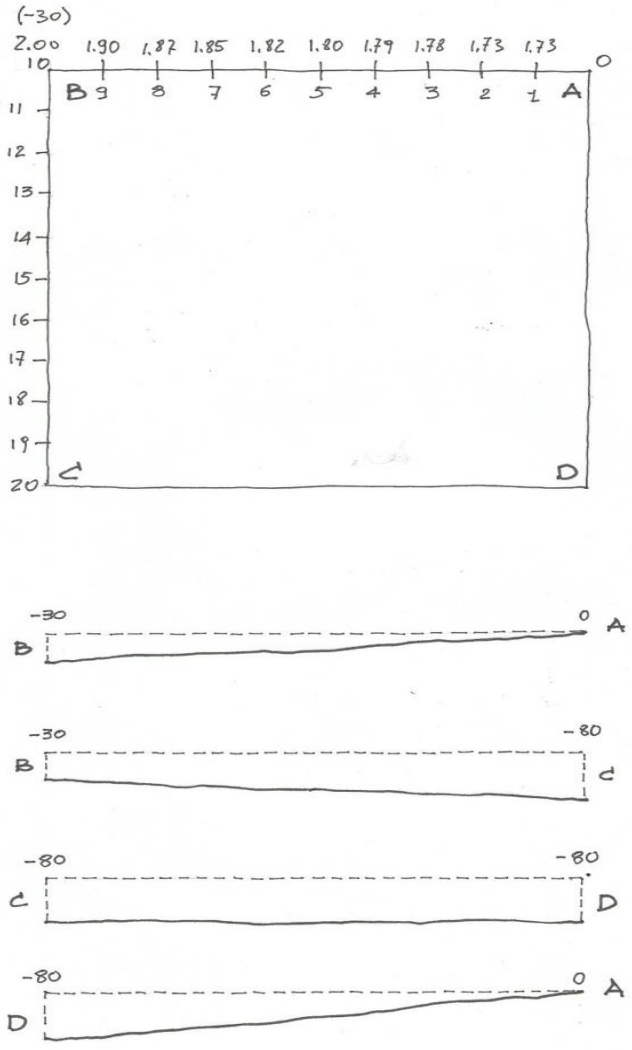



*Fig. 12: Side profiles of an excavation area*

the first operation to perform when the excavation

is opened. He will take the rod to the point to be surveyed. Start from the intermediate points on the side A-B (including B), then B-C, C-D, and lastly D-A.

Now you are at point A2. The rod will be held from behind and placed in a vertical position: the rods are sometimes equipped with a bubble that can however mark the vertical with respect to the forward-back direction; communicate verbally if through the instrument you see that the rod is sloping to the right or the left. Now take a reading through the lens at the centre of the crosshairs. Let us assume that the instrument reads 1.75 m.

*Fig. 13: Overview of Excavation at Mes Aynak*

This means that A2 is situated -0.05 m (that is 5 cm) below point A (datum point); this is because the relative level A2=reading of A2-height of the instrument: -0.05

=+1.75-(+1.70). Repeat this surveying operation for all the points and mark the reading on your 1:20 map; you can perform all the calculations at home in the afternoon. Through this operation you can graphically reconstruct the profile of the excavation area, side by side. Of course, we repeat for the last time, all the profiles will be decreasing with respect to point A which must be the highest point. Now you define a series of points inside the trench, also in abstract (four rows every two meters from AB to CD). This is the case if there are no increases in level or mounds. Otherwise, they will have to be multi surveyed as they may represent the covered top of underlying structures. In this case you have also to sketch the shape and position on your 1:20 planimetric map. The technique for doing this will be illustrated in the Documentation chapter.

## 6. Excavation technique and site organization

Archaeological excavation is a complex operation. Like all complex operations it can be simplified with the help of proper organization. All organization becomes simpler if the persons involved participate in the various phases and the internal logic. In this sense it is extremely important for all the staff involved to participate at different levels regarding the significance of what is being done. In short, it may be said that every well-organized excavation can act as a training camp, and at the end of the excavation all the subjects involved will be better informed than they were at the beginning of the work. If this training is extended to cover also the workmen, and the workmen come from the same community as the land on which the excavation area is situated and from which also the site watchmen come, the positive knock-on effects in terms of awareness are multiplied. A site that is “understood” at the local level will be better defended against the threats typically affecting every archaeological site: illegal digs, vandalism, neglect,

encroachments, and sometimes lack of interest by the responsible agencies.

Besides, if it is considered that archaeological excavation attracts employment to the community, archaeology can make a direct contribution to the local economy by means of a series of excavation seasons in the same area. A properly maintained site attracts visitors; tourism is a form of indirect support to the local economy. In other words, an archaeological excavation can have a huge impact in educational, social and economic terms, over and above what the archaeologist himself is capable of imagining. However, one must be ready and aim at obtaining this result, in addition to the scientific results, and so it is necessary to prepare everything before and during the excavation work, above all by training the local staff.

The organization of the work must be clear and well-defined, with simple shared rules. Excavation is a delicate and potentially dangerous activity carried on by a number of persons in a restricted space, often with only

limited available time. Above all order is necessary. Order starts with the working hours.

My personal experience suggests that 6 hours of work on site is an optimal length of time to avoid losing concentration and to perform a good amount of work. Work starts at dawn, between 5 and 7 o'clock, depending on the time of year and the latitude, and the first action is to call the roll of the workmen and hand out the tools.

In agreement with the landowner and according to the assessments you have made, we have already selected the foremen, say one every 20 workmen, to whom the following tasks will be assigned: roll call, handing out tools, checking the tools handed in at the end of the day's work, maintenance of the wheelbarrows and tools (removing soil and washing them at the end of every day; the tools are soaked in kerosene each weekend and sharpened regularly). As far as the roll call is concerned, the fact of delegating it to others does not prevent you from get to know each workman and addressing him by name and thus increasing team spirit.

One or more workmen can be chosen for measurement operations (setting up the optical level, using the surveyor's rod and helping make the measurements using the tape measure and plumb line) and for the photographs (setting up the blackboard, removal of tools and baskets from the area, etc.). A group of workmen with mason's skills or experience in mixing (lime) mortar and cement will be deployed to construct retaining walls, drains, do minor restoration work, etc. For example, a team of 40 workmen will have perhaps 2 foremen, 2 technical assistants and 5 masons. They will all do the digging work but it must be possible to delegate them to coordinate or perform other more specific activities.

Let us go back to the beginning. After calling the roll the tools are handed out and the workmen move to the working area. Three hours after the beginning there will be a 15-minute break after which the work is resumed until the end of the day. Half an hour before the end of the working day all the excavation activities are interrupted and the cleaning operations begin. All the excavated soil must be removed, the ground

surfaces and razed walls, as well as the wheelbarrow tracks inside the excavation must be cleaned using trowels, together with the edges of the trench. After handing in the tools, the workmen will carry the baskets containing the materials to the vehicle and leave the site. The next time they meet will be the next day unless there are urgent reasons for opening up the site in the afternoon. The clean-up prior to closing is a very important operation: if it rains or is windy the unremoved soil will be scattered everywhere and will spoil the part already excavated.

It is necessary to take into account the fact that early in the morning you have the best conditions for taking photos of the excavation (no shadows, diffuse light), in addition to the fundamental fact that the next morning you will resume the excavation and that the situation must be clear to your eyes and to those of the workmen.

The philosophy of the excavation, that is, the fundamental theoretical basis underlying the stratigraphic excavation (i.e. the scientifically based archaeological excavation), can be summed up in the following proposition.

The excavation proceeds with the removal of the results of a process that is the reverse of the order of deposit. Let us take an example. Let us imagine a dining room with a table laid with plates, forks and glasses, a couple of overturned flower pots on which someone has laid a jacket and on top a pen. Supposing we were to “excavate” this situation layer by layer, that is, by deposition phases, in the reverse order, we would first have to remove the pen (1) which lies physically on top of the jacket (2). The jacket (2) lies on top of a plate, which stands on a flat plate, which stands on a tablecloth covering the table, which stands on a carpet that covers the floor. But after you have removed (2) and exposed the whole situation it will be clear that before (2) was placed on the plate (a fact that indicates a probable phase of “abandonment”: you don’t leave a jacket on a plate), the two flower vases (3)-(4) had fallen. The latter must be removed before removing the plates (5)-(6)-(7)-(8), the flat plates (9)-(10)-(11)-(12), the forks (13)-(14)-(15)-(16) and the glasses (17)-(18)-(19)-(20), the tablecloth (21), the under-tablecloth (22), the table (23), the carpet (24), and you ultimately reach the floor surface (25). The

sequence thus obtained can be illustrated using the so-called “Harris matrix”, named after its inventor, the archaeologist Edward C. Harris, and subdivided into contemporary actions or periods (denoted as “structural periods” in the excavation).

According to our matrix, in Period I the floor plane was constructed (which did not necessarily involve a carpet), in Period II a carpet was laid down, in Period III a table was added (which was evidently not laid), in Period IV the table was laid and decorated with two flower vases, in Period V the vases fell over (a natural or deliberate event?) and nothing suggests that the meal was served and eaten (let us imagine a sub-Period Vb of temporary abandonment). Lastly, in Period VI someone left a jacket with a pen and the area was abandoned definitively.

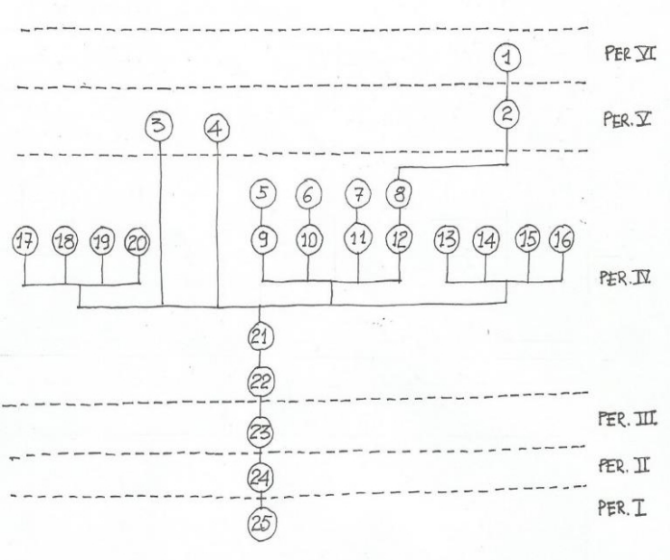



*Fig. 14: Digging up our dining table. Physical matrix and Periods*

These structural periods do not correspond to an equivalent number of cultural phases. Let us interpret this situation. Let us provisionally group together Periods II-IV in the same cultural phase, also because the carpet, table, plates and forks refer to the same macro-action or macro-phase: the room has been organized in view of a meal. Likewise, it will be important to know when the jacket and the pen were made as this will provide chronological information on the phases of

abandonment prior to the period in which the table was laid.

Let us suppose that the jacket was made in 1985: this allows us to say that the table was set before 1985, and so 1985 is the *terminus ante quem*, i.e. the latest possible date. However, under one leg of the table we find a coin from 1962: this find does not date Periods II-IV to 1962, although it tells us that the table was set after 1962, and so 1962 is the *terminus post quem,* i.e. the earliest possible date. So, nothing could have been done prior to this date. Therefore, Periods II-IV lie between 1962 and 1985.

When exactly? In the absence of organic remains that would allow a C14 dating we cannot know this from a study of the materials, although with one reservation. If – for the sake of hypothesis – the dinner service had been inherited and had been produced in 1905-1915, we would have to thank the 1962 coin and the 1985 jacket which would be key elements capable of bringing the chronology forward. We are lucky because a further study allows us to determine that the under-tablecloth is a synthetic product of the

1970s (whereas the linen table cloth is older, from the 1940s) and the flower vases are clearly a porcelain product manufactured in the 1980s. In this way we begin to understand the co-presence of objects from different periods of the same macro-phase: what is important is that the latest object is what counts not the oldest one. Reconstruction: the table was set between 1980 and 1985 using also quality material dating to previous years and preserved; the table was abandoned sometime after 1985.

What about the 1962 coin? It loses its quality of *terminus post quem* as this is now taken on by the early 20th century china. How can this coin be explained? This is a good question. 100 coins from British India would allow us to date the levels with certainty unless we are excavating the home of a coin collector. Coins actually have a long life (even if they are no longer in circulation they still have their metal value) and are often lost as they are small objects subject to constant movement. As far as the first point is concerned, here is a personal example: one day at Chicago airport I was given a 1929 penny in some change. My

curiosity was aroused and I began to collect pennies in order to find those *ante*-1960 and I was able to verify that in the space of about three months 10% of the pennies I received belonged to a period between 1909 and 1958 and they were still in circulation in 2012! What value would they have for a future archaeologist?

Another possibility: are we sure we have not made a mistake? Errors are constantly being made: did that coin come from a sure layer? If we are sure no errors were made let us try and understand the nature of the problem. During the excavation we will constantly be finding holes made by rodents, cavities left by tree roots, filled with percolated or downward filtering material, from more recent layers to older layers. Vice versa trees can be uprooted and thus bring to the surface older objects and fix them in that position when the sun dries the soil.

Once the “philosophy” of the stratigraphic excavation has been understood, only a well-ordered working method can (albeit partially) prevent us making mistakes. Just as the site must be well-ordered so must the excavation process.

Let us return to our team of workmen. In the early stages the workmen will be used to remove the surface layer (farmland or untilled land) which is generally sterile. A mattock or shovel can be used; any objects found will be a mixture of recent and ancient, the latter sporadic or erratic, and in any case not chronologically reliable even though they may be indicative of what we can expect to find at a deeper level or in the vicinity (the objects have been transported or uncovered by rain, removed by tractors, exposed during earth moving, etc.) The work with the picks must take this into account; the workmen must be lined up; in front of them the foreman will observe the land and collect the material in a basket; he will follow the work of the wheelbarrows. Behind the pick workers the shovel workers will remove the soil; at the sides the wheelbarrows will come and go, taking away the soil debris. The stones will be taken away in wheelbarrows or baskets and dumped on one side; they will be used in restoration work and for masonry work. The workmen will move forward as they work. Behind the shovelers a team of workmen will clean the ground with large trowels. If two working groups

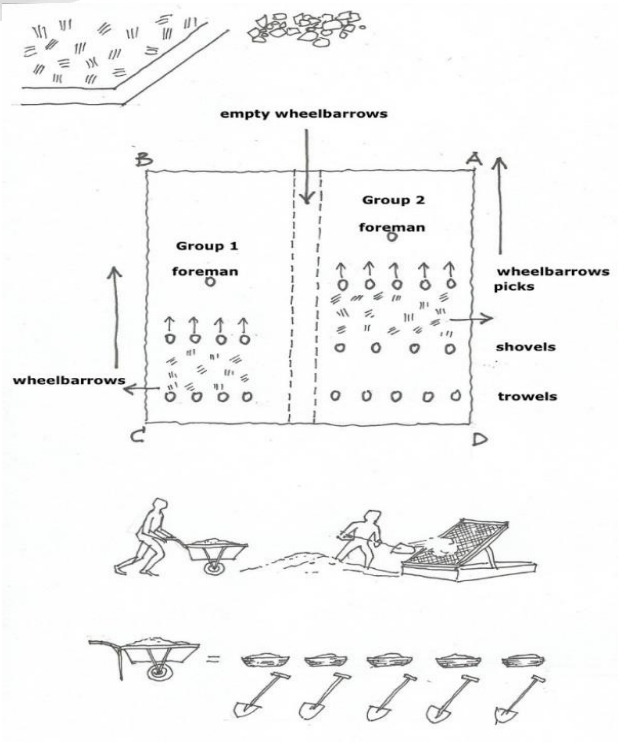



*Fig. 15 – Organization of the excavation trench1.*

are used a passageway will be left in the middle. Before the soil is definitively discharged a sieving area can be set up. How full can a wheelbarrow be? A maximum of 5 shovel full or 5 baskets of soil. Rotate the workmen during this phase: one hour working with a pick and one hour with a trowel, one hour with a shovel, one hour with a wheelbarrow. This will reduce fatigue, contribute

to the diffusion of manual techniques and distribute physical effort and will give you a chance to appreciate who best handles the various tools. Once the surface layer (1) has been removed and all the objects found are placed in baskets, marking the excavation, the layer and the date, a collapse layer, for example, covering the entire area (2) is laid bare. This is described on the excavation form and/or

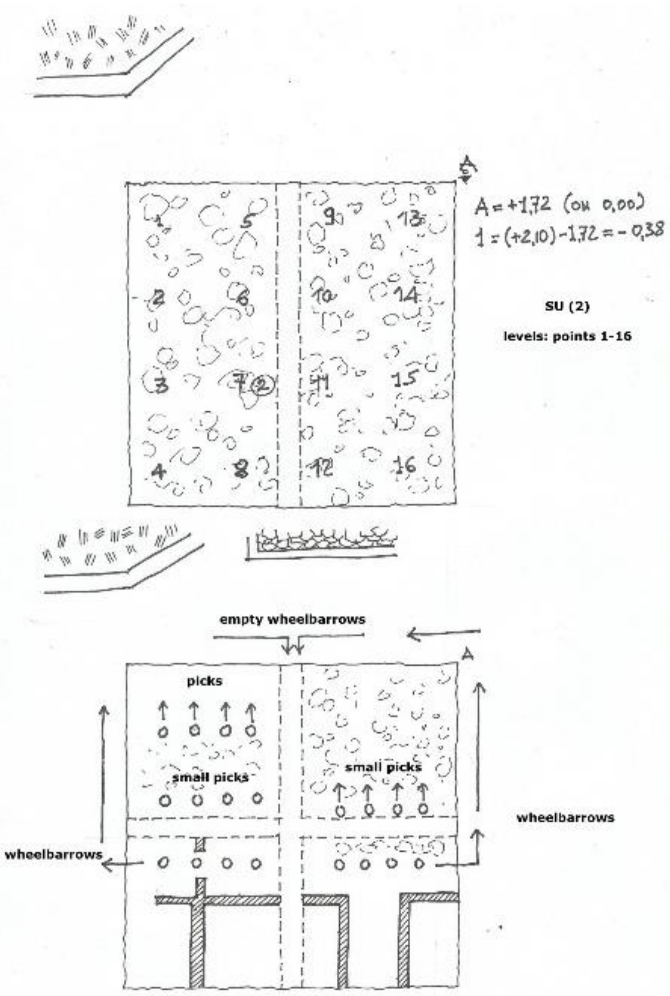



*Fig. 16: Organization of the excavation trench 2*

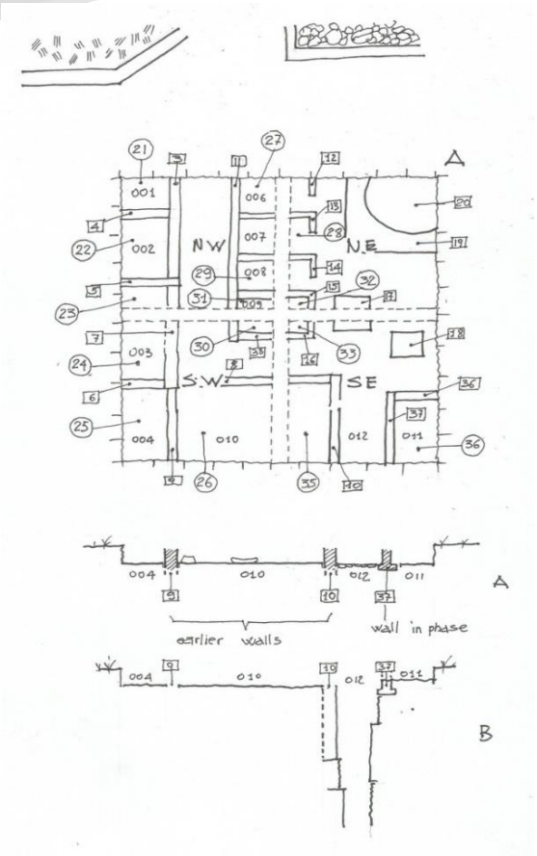



*Fig. 17: The situation after removing SU (2)*
*Below: deep designing vs. horizontal excavation*

in the excavation log (I prefer the second option, also because this way you have the previous situation constantly at hand, and then surveyed. We have seen how to do this in the preceding chapter. The area, now perfectly clean, is photographed with a small blackboard identifying the excavation, layer and date, with a metric scale and the arrows

indicating N. After performing these three operations (description, surveying, photo), fresh baskets are prepared with a new indication of the layer and excavation begins. Removal of the collapsed stone debris will reveal the first structures. At this point it is advisable to leave a space for transversal access: in this way our trench will be divided into 4 sectors measuring about 4.5x4.5 m and denoted as NW, NE, SE and SW. At this point the work changes radically.

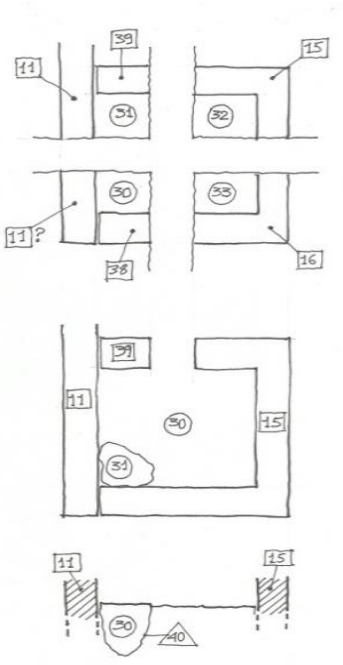



*Fig. 18: The horizontal stratigraphy before and after removing the baulks*

In the first place, number the rooms: use the same system as that used in the initial survey: 001 will be room 1, excavated in the first campaign; from the second campaign you will start from 100. The number of layers will be enclosed in a circle: (1); the numbers of the wall units inside square brackets: [5], negative units (holes, but not the filling, wall collapses, etc.) between triangles <7>. When you write the excavation report these forms will be replaced by different brackets (as above). After removing (2) it will not be possible to excavate all the rooms simultaneously. It will nevertheless be important to proceed by visible phases, that is, not to dig down to 3 m in one room to reach the wall foundations while in another you dig to a shallower depth because it is less interesting thus by chance creating an incomprehensible situation for yourself and the workmen. Proceed in an orderly fashion, gradually exposing the same structural phase in the whole area, in all the rooms. As an expert workman said one day, “page after page, the excavation is read like a book”.

I have made a graphic model to explain this concept more clearly. In the first case (A) you will see that the later phase is composed of open and closed rooms, courtyards, kitchens and passage ways that make partial use of earlier walls ([9] and [10]) and partially new structures (contemporary, like [37]). In the second case (B) all you know is that room 012 in the earliest phases was different,

narrower, increasingly narrow and you have no information; you have only taken a core sample and gathered a sequence of materials.

Room 012 will be 012 only as long as the limits of 012 are respected. In this phase 012 is a street but underneath we will have a closed or open room but not street 012 which is such and will have this number only in this phase.

After removing (2) a network of structures appears. Number the walls and their razing (negative unit): at each section of wall, a wall can be formed by several masonry sections or units. Wall [11] differs from [38] because they are contiguous but separate. [38], [16], [15] and [39] could be just one wall (=a single number), or not; we will know only when the bench/baulk used as a passage has been removed. The same is true for layers (31), (32), (33) and (30), which, until proved otherwise, are numbered separately.

Indeed, after removing the baulks it might be discovered that [39] and [15] are different and that [15], [16] and [38] are one and the same wall [15] (the other two numbers have been eliminated and

not reused), and that layers (30)-(33) are actually (30) cut by filling (31) and the pit <40>. All the rooms have been given a a number and so from now on this information will be added to the information card: area, room, layer, date.

The tools and organization now change: you will form smaller teams; one group of workmen will work with picks and small and large trowels, each accompanied by an assistant with a basket and trowel. The excavation is performed working backwards so that the excavated part is left clean.

Of course, as the excavation proceeds, the network of structures will be plotted and before excavating each single layer, it will be described, surveyed and photographed and thus given a number for the information card.

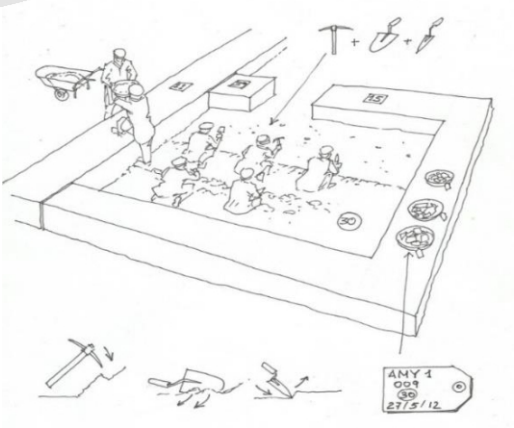



*Fig. 19: Organization of the excavation trench 3*

to treat the holes left by illegal diggers (How which (31)-<40> will prove to be), the structures, the planes and all the aspects of the graphic documentation will be explained in the following chapters.

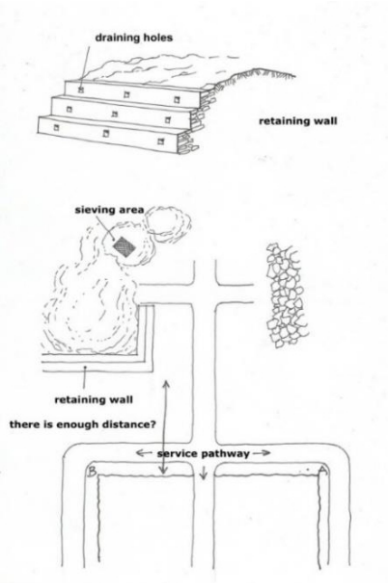



*Fig. 20 – How to deal with aggregate soil and stones*

## 7. The problem of excavated soil and aggregate material

Before going on to analyze the excavation and documentation operations further, I feel it would be useful to include three short chapters on several preliminary operations involved in the excavation.

Repetition is useful: the excavation is a complex and dedicated operation which at the same time must be carried out in an orderly fashion. You have only six hours in each working day. If whenever you have to take a photo or do some surveying you have to interrupt the work, the excavation and the work rate will be affected. Too many interruptions will sap the progress of the work. Let us imagine a

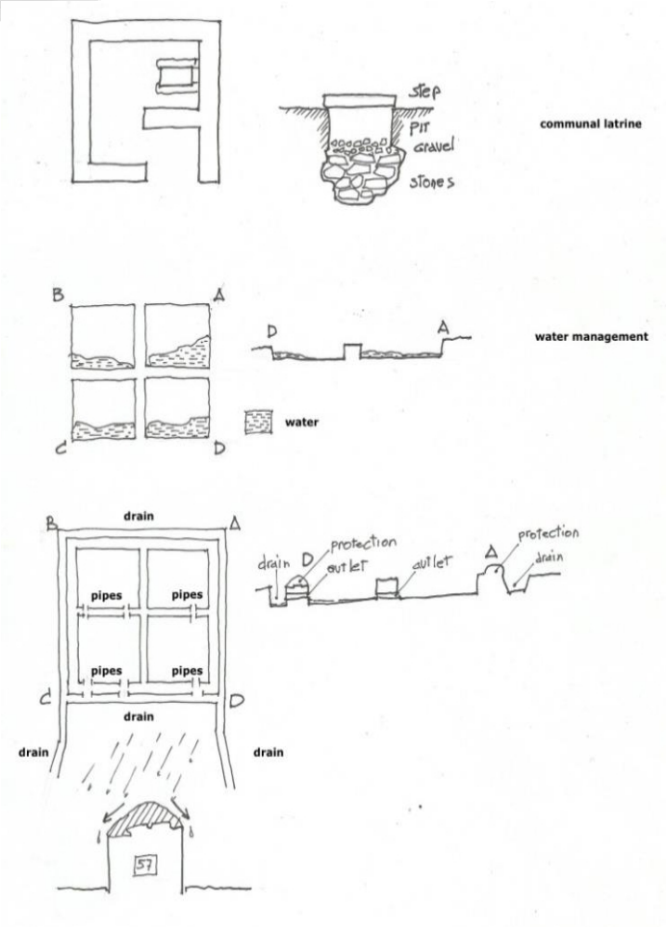



*Fig. 21: How to deal with the problems caused by heavy rains*

Football or hockey match being interrupted for 10 minutes every 20 minutes or so.

When play resumes the players will have lost concentration, are distracted, slower, less reactive.

What can you do during the frequent pauses in the excavation? If you were the coach of a sports team, you could do warm-up activities; in an excavation you bring in “secondary works”, for instance cleaning up other rooms (with small trowels and brushes), or the clean-up of trench edges (with large trowels), the tidying up of excavated soil, the construction of small drains and restoration and conservation activities.

The orderly disposal of the soil is an important aspect of the excavation organization. For every cubic metre of soil excavated you will have a cubic metre of spoil to be disposed of. As we have already seen, the spoil must be stored in the discharge areas. These have to be managed. You can just leave your mound of soil to accumulate in a disorderly fashion. In the case of rain or strong winds you will again find this soil back in the excavated area and then you will have a tough problem to solve. The discharge area must be clearly delimited and contained by walls which must be stepped so as to reduce the weight of the soil (especially after heavy rain) which can cause them to collapse. You thus have to set up a large and

easily accessible entrance area and a sieving area. The containing walls will be made of excavated stones which, above all in the excavation of settlement areas, represent a significant part of the excavated material.

The stones not used for this purpose will be used for conservative restoration work which will be gradually carried out for the purpose of leaving a site that is comprehensible to the general public when the excavation has been completed. This is not just a secondary objective as the excavation will certainly have been funded with public money.

## 8. Water management and protecting the artefacts

Among the various secondary activities do not forget to set up one or two latrines at the back of the discharge area in a place that is in any case suited to this purpose. A field latrine is essentially a small unroofed area closed by an dis-axial (bayonet-like) entrance to guarantee privacy and a loose rubble drain. The cleanliness of the place is guaranteed by sunshine and the use of soil. Rain will do the rest.

Yes, the rain. A beneficial rainfall can be destructive for the excavation, especially during the monsoon season. You will be surprised to see how your excavation reacts unfavorably to the rain compared with the nearby fields. The reason lies in the fact that the excavation eliminates the natural ‘skin’ covering the land, the layer of grassy humus, and the natural micro contour of the land, besides that fact that, as you excavate, you are actually digging a ditch which is therefore a natural receptacle for rainwater and surface runoff. In the first place you have to construct a drainage system all around the excavation site. If necessary, lay the drainage pipes between the untouched baulks so as to allow the water to run off from the various sectors outside the excavation. If you have a problem similar to that illustrated in the drawing opposite, you can solve it using the proposed system. If you have deep trenches in very rainy regions get a diesel pump. If your budget does not permit this, borrow one or lease it from your landowner. You can also restore old drains where possible.

At the end of the excavation, remember to fill in the deeper parts to restore a minimum degree of

hydrogeological sustainability in your absence. Whether you have concluded the excavation or intend to resume it the following season, between the lowest level reached and your filling, place a layer of sand or fine rubble or (although I do not recommend this) a sheet of plastic so as to clearly mark the filling plane when you (or someone else) resume the excavation. Plastic sheets are good for temporarily covering excavation areas or unremoved soil mounds during sudden rain storms. Use them only for delicate surfaces or structures undergoing excavation. If you encounter plastered surfaces, use mats; even if they are not perfectly impermeable, they will allow the artefact to breathe. The top of the walls, or their razed surfaces, once the structures have been documented, can be covered with a protective layer of mound-shaped compact soil, as shown in the sketch. This is one of the famous “secondary works”, as well as being a good method for utilizing excavated soil.

## 9. Preliminary notions of building restoration

The term “restoration” can be interpreted in different ways, and evokes different approaches and different philosophies. The term comes from

the Latin and means “to reinstate”. A building is “restored” when its original use is “reinstated”. Archaeologists and architects disagree also concerning archaeological restoration. For the archaeologist, restoration is essentially “conservative”, that is, its aim is to reinstate the volume within the conserved dimensions as revealed by the excavation for the purpose of conserving the static stability of the structure. Let us take the example of a vase. If the rim, the mouth, of the vase is more than ¾ intact it is possible to reconstruct the missing part. If the rim is missing any reconstruction will be arbitrary. However, also in the first case errors may be made. Supposing that in the missing ¼ of the vase there was a spout. We do not know this and reconstruct it without a spout. The result will be a vase that is typologically different from the original one, an invention, a fake. The same concept applies to structures and architecture in general.

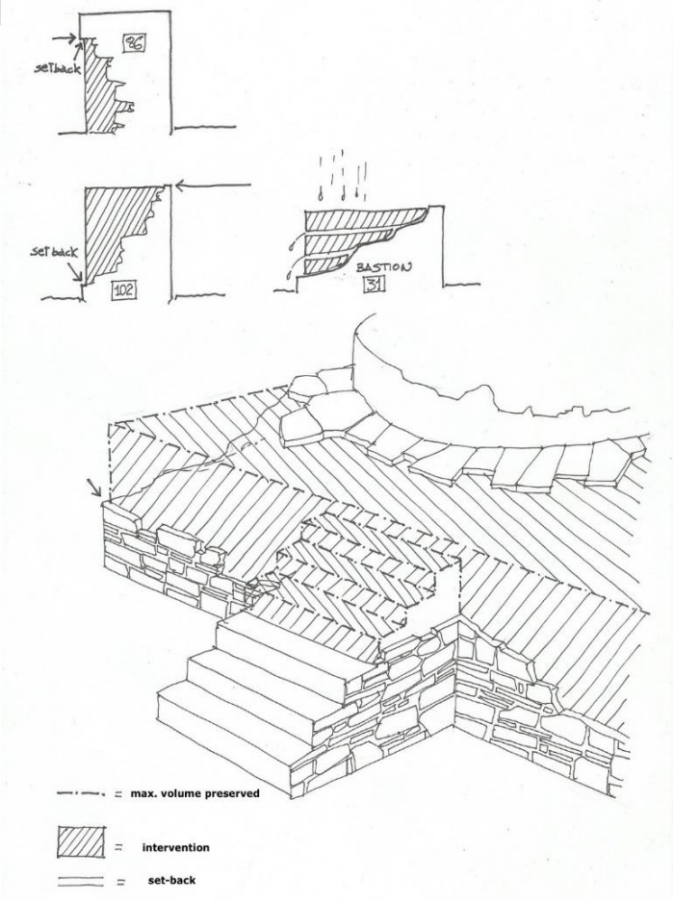



*Fig. 22: Set-back masonry restoration work: some example*

Another point is related to methodology. In the past (see Sir John Marshall's 1923 *Handbook*) it was believed that restoration "must not be visible" and so techniques and materials imitating the original as close as possible were selected. Modern

Restoration Charters and international rules state on the contrary that the restoration “must be visible” and open to interpretation.

Therefore, different or purpose-designed materials and/or construction techniques must be used (such as “set back”). As far as consolidating materials are concerned, modern intervention must make use of chemical stabilizers only for friable plaster and stones (infiltration of resin like Microacril CV 40 and water; 1:3; 25% in the fractures, using syringes) and avoids the use of cement (which above all is harder than the original and may damage it): it is preferred to use easy to mix mortars based on local materials (for instance, brick dust, slaked lime, clay and straw in the ratio of 1:2:2:1), which have the advantage of being readily available, cheap, easy to prepare and lighter than the original material. If necessary, add a mild chemical binder such as Primal (acrylic resin emulsion) diluted 20% in water. Remember that it must be possible to eliminate the restoration without damaging the original structure. Indeed it often happens that, when removing a cement mortar restoration, the latter takes with it a part of the original structure.

The conservative action on the excavation is directed above all to the structures liable to collapse and is applied to the extent of the maximum part missing from the original structure. Mostly dry stone will be used (in the case of stone structures) or depurated clay poured into moulds (in the case of *pisé* or unbaked clay structures). While in the second case the presence of a specialist is required (see 14. Addendum), the first case, taking all due precautions, can be directed by the archaeologist.

The concept is the same as for the vase in which 3/4 of the rim has been conserved. If the restoration makes use of local stones or stones obtained from the excavation, the restoration masonry will be performed using a set-back of about 5 cm with respect to the horizontal and/or vertical line of the ancient masonry. If a large volume has been restored, leave a loose stone interface and make provision for holes to drain off rain water. Water causes everything to swell, both excavated soil and the stone courses, and can cause collapses.

Remember that the aim of our action is to conserve the structure and protect it and only secondarily to

allow a clearer interpretation of the monument. If you manage to achieve both results and give priority to the first point you will have done a good job. Remember however that it must be possible for anyone to distinguish which work is yours and, if necessary, remove it without damaging the original. In conclusion, the following brief notes explain how to treat the excavation materials (first-aid intervention):

1) **Pottery**: must be washed in running water and brushed with a light brush without removing the coating or slip, or the traces of sooting and incrustations of organic material (these may reveal the contents of the vase).

2) **Coins**: washed rapidly in distilled water and brushed with a soft brush to remove any soil. Dry. Under a magnifying glass use a wooden tool (i.e. something softer than the coin) to remove visible incrustations. You can then wash the coin again using a light abrasive and repeat the operation. It is a fundamental point that the oxidation must not add volume but represent a modification of the surface. By removing the oxidation you are also removing part of the coin, its pattern, legend, etc.

Above all, after aggressive action, while you might have a clearer image (although knowing that you have removed the top part of the image), you will also have a lighter coin and one that is numismatically less valid.

3) **Iron objects**: a rapid bath in a solution of distilled water and tannic and/or sulphuric acid (5%) may help to remove a tangle of rusted material and give you some idea of what the object is. Here the same may be said as for the coin, although the cleaning in this case may be slightly more thorough. Always remember to use gloves and safety glasses.

In order to inhibit corrosion after drying, a film of amber wax may be applied.

4) **Stone objects**: after washing, water and vinegar (2:1) packs may be used to remove the more superficial incrustations. Be careful in the presence of plaster and paint traces: if there are any it is better not to wash. Then proceed in short action steps: 3-5 minutes washing and observation, followed by physical removal (as for the coins) followed by further washing.

*Fig. 23: Excavation of area 045*

## 10. The archaeological section: myth and reality

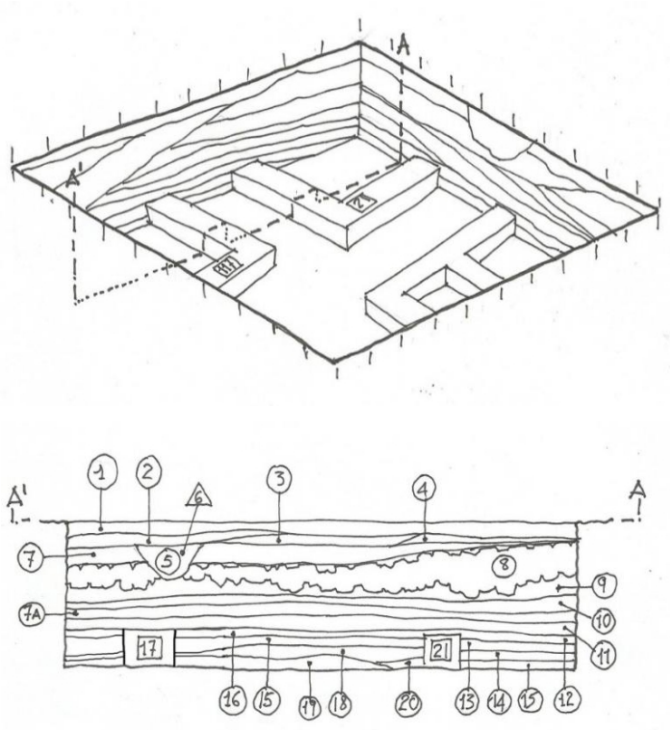



*Fig. 24: The "reconstructed" section is one of the many possible "real" sections*

In this chapter we come back to the actual excavation itself and resume the topic of methodology.

The term "section" is used to refer to two separate things. The physical section is represented by the

inner wall of the excavation which runs all around below the unexcavated baulk. On the other hand, the reconstructed section consists of the graphic representation of the stratigraphic sequence along a series of points selected by us.

In archaeology the two things used to coincide, with the latter being the graphic representation of the former.

*Fig. 25: Excavation of Top Dara stupa*

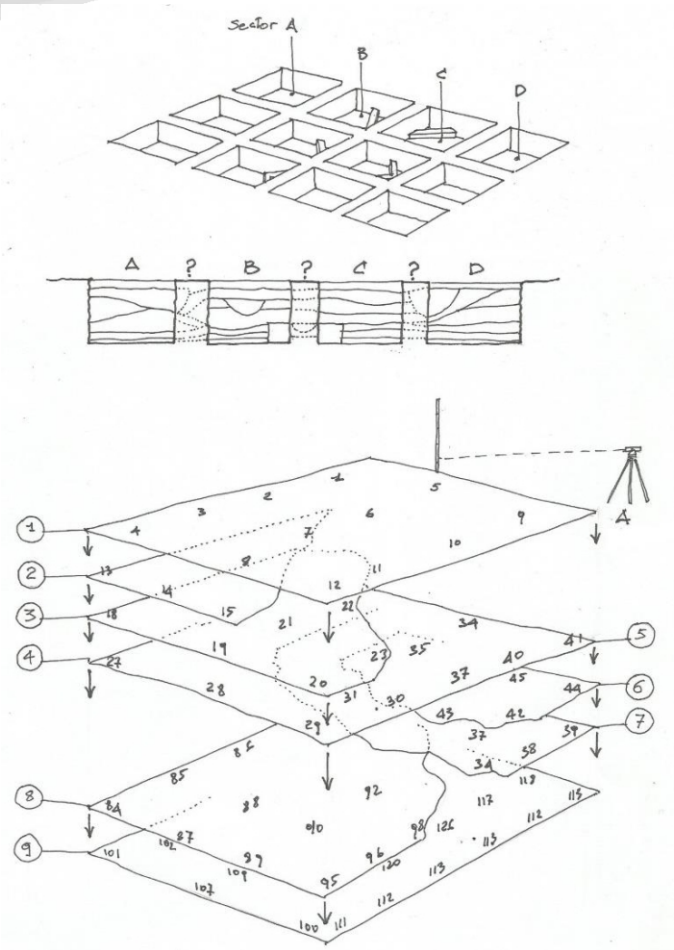



*Fig. 26: The section and its problems 2. The sequence of the layer plans*

Two fundamental problems lurk in this old conception of section. The first is a practical problem: you must never, never leave vertical

excavation sections. For safety reasons the profile of the section must be slightly sloping. Vertical sections are constantly being eroded by rain. They become fragile and can collapse, endangering the security of anyone working below and those working on top of them. Therefore, if the section is not vertical (and it must not be) its transfer on to a plane (the sketch) becomes a graphically inaccurate operation. For the same reason, sub-vertical surveying is incorrect or at least more complicated than it might seem (the measures must always be transferred to the vertical, as shown in the sketch below).

The second problem is essentially archaeological in nature: the wall section displays only a part of the excavation; among other things, the sketch made of it represents what we have not excavated! To overcome this problem, the method previously used was to multiply the wall/vertical section by excavating per quadrants. This itself reduced the view of what is being excavated as we have already seen and thus the capacity of the section(s) to represent the real

conditions. The old method roughly followed this sequence: excavation of the quadrants, representation of the sections, excavation of the baulks/unexcavated sections, unification of the sections. As the baulks/unexcavated sections were narrow/thin, they were dug up and the connections between the sections remained uncertain or were reconstructed *a posteriori*.

Again, referring to the section: if you cut a lemon you will see that the normal section will differ from the transversal one and neither represents the real situation. This why you need to have several sections, albeit overlapping, in order to represent the real situation.

Modern archaeology tends to excavate extensively wherever possible and produces sections reconstructed from the planes of the layers surveyed using the optical level vis-à-vis a datum point. These sections can be reconstructed in any part of the excavation, wherever they can enhance the illustration of the stratigraphy. All the planes have been surveyed. All the superimposed strata plans give a kind of exploded view of the stratigraphy. A section may be cut at any point

and thanks to the altimetric and planimetric data it can be simply sketched where needed.

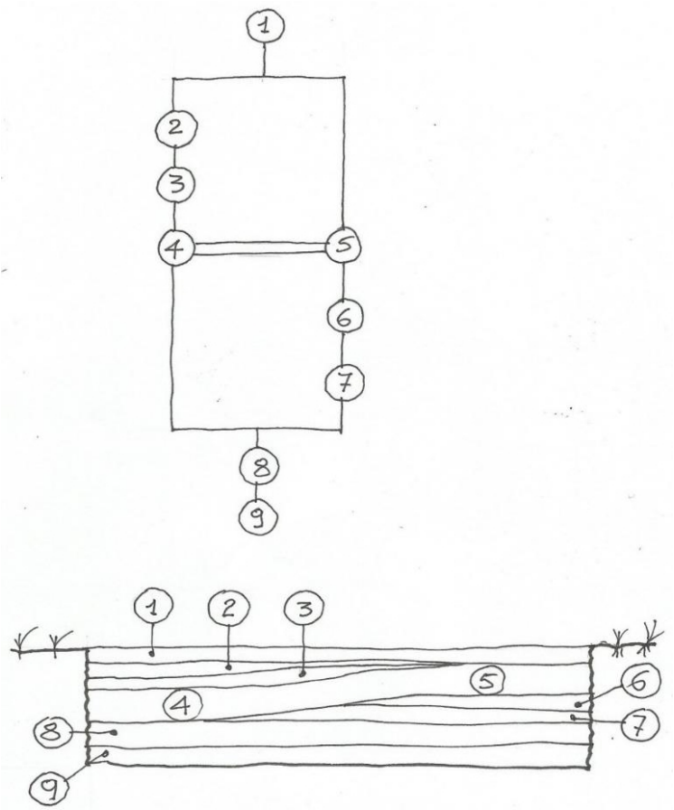



*Fig. 27: Section and matrix: a documentation that must go in tandem*

## 10.1 Vertical section

The vertical section merely represents a random compulsory portion of the real situation. The reconstructed section represents the three-dimensional nature of the room in which we have been working.

The use of surveyed strata plans allows us to avoid the old and unfortunate habit of taking the elevation (with respect to the wall, with all that has already been said) of the finds. I say unfortunate because as you are digging you mostly do not know what it is that you are unearthing, something of which you become aware only after the materials have been cleaned and analysed. On the other hand, if the object that is identified as such only after cleaning has a label indicating the stratum to which it belongs it will also have its elevation and thus its position in space. This does not allow you, for example, to avoid taking the position of certain medium-sized artefacts during the excavation. For this you will use the grid of squares if you have closely spaced reference points

(classic case: if you are in the corner of a masonry structure), or we will use triangulation (see following chapter). Not the elevation, however, as you will already have surveyed the elevations of the stratum and will take the elevations of the following layer, which is possibly the one on which the object in question is standing.

Graphically, the exploded view of the strata (1)-(9) shown in the preceding sketch can be graphically represented in this way and concisely through the adjacent matrix.

Once a layer has been exposed with all its limits, it must be surveyed and entered on the plan. It is then photographed.

Do your best to avoid dark shadow contrasts. If you have time put off photographing until the next morning or create shade using a cotton cloth screen. Position the blackboard with the data and the graduated North arrow. Do not include equipment, wheelbarrows, workmen's legs, etc. in the photographic field. Always take three shots: one with the blackboard and arrow, one with the arrow and one without anything.

The graphic documentation can be performed by a technical specialist or by means of the total station (which reads also the elevations) with the help of georeferenced zenithal photos (or Ortho photos), etc. Only rarely will funds be available for this type of aid so it would be wiser to be able to perform the graphic documentation without help. Or rather, to be able to document the relative position of objects inside our excavation (the final map will be made by a draughtsman but you should be in a position to collect the data).

You will need your wooden table with the 1:20 scale map of the

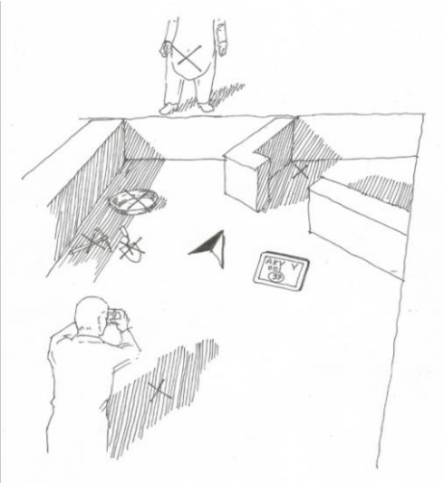


*Fig. 28: What to do when taking the photographic documentation*

trench on it and of the bench marks drawn on mill metric graph paper. The map will be covered by a sheet of polystyrene or tracing paper. You will need a tape measure, a plumb line and an assistant.

The system you are about to apply is called triangulation. Each point that you take must be measured from two previously known points. These two measurements represent the two sides of a triangle (as far as possible equilateral), the third being known as it is the (known) distance between the two known points. For instance, you have to define the position in space of the corner of a wall. You measure the distance between the angle and two known points along the staked-out trench edge/baulks. Having defined that point of the wall corner, it now becomes a known point and you can use it to take further measures, and so on. In this way you create a network of linear measures like the one known in topography as a “trigonometric polygon”. Clearly mark the points you have found with a progressive number. This has nothing to do with the number of the strata or rooms, nor with the alphanumeric definitions A3,

B7, etc., of the bench marks. Use Arabic numerals, lists of numbers that you will eliminate each day. Indeed, it is understood that you will mark on the plan the points on the same day as they are taken.

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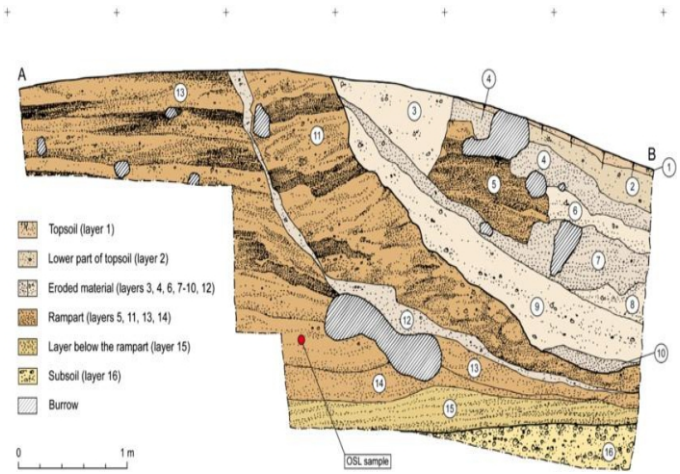
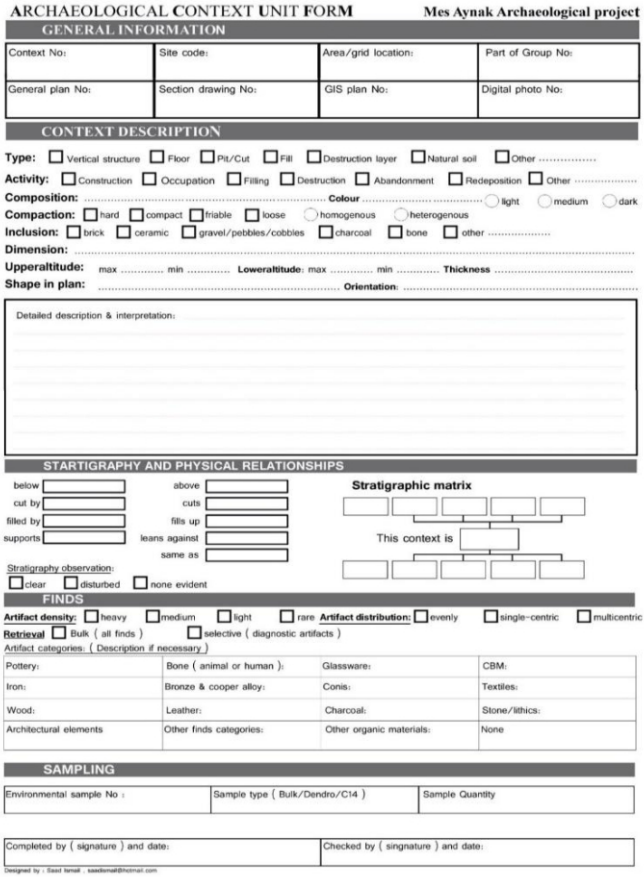



*Fig. 29: A good graphic rendering of an archaeological section; after C. Grutzner et al. (2012)*

Improving archaeological site analysis: a rampart in the middle Orkhon Valley investigated with combined geoscience techniques. Journal of Geophysics and Engineering, 9, 4.The measures are taken with the measuring tape held taut and

horizontal (you can use a hand-held level to check that it is horizontal). In the case of measurement of points lying at different elevations, start from the highest point and use the plumb line as shown in the figure. When you get back home, either you or the draughtsman will reduce the measures taken to the scale of the map (usually1:20 or 1:50) and mark out the distances using a compass. This is what you do: you have your sketch in progress, with the scheme of the trench and all the bench marks; we have a measurement of 1.90m from point B11 to point 2 (wall corner), and of 1.92m from point B14 to the same point 2. Using a scalimeter (a ruler with three faces each having different scales) you open the compass to 9.5cm (1:20 of 1.90 m) with the point on B11 and the other part of the compass is used to draw the arc of a circle in the direction of the presumed point 2. Then we open the compass to 9.6cm (1:20 of 1.92m): you position the point on B14 and trace out the arc of the circle. The point of intersection between the two arcs will be point 2. In practice, this system is a simplified version of trigonometry and empirically performs what the total



ARCHAEOLOGICAL CONTEXT UNIT FORM — Mes Aynak Archaeological project

GENERAL INFORMATION

| Context No: | Site code: | Area/grid location: | Part of Group No: |
|---|---|---|---|
| General plan No: | Section drawing No: | GIS plan No: | Digital photo No: |

CONTEXT DESCRIPTION

Type: ☐ Vertical structure ☐ Floor ☐ Pit/Cut ☐ Fill ☐ Destruction layer ☐ Natural soil ☐ Other .....

Activity: ☐ Construction ☐ Occupation ☐ Filling ☐ Destruction ☐ Abandonment ☐ Redeposition ☐ Other .....

Composition: ..... Colour ..... ◯ light ◯ medium ◯ dark

Compaction: ☐ hard ☐ compact ☐ friable ☐ loose ◯ homogenous ◯ heterogenous

Inclusion: ☐ brick ☐ ceramic ☐ gravel/pebbles/cobbles ☐ charcoal ☐ bone ☐ other .....

Dimension: .....

Upperaltitude: max ..... min ..... Loweraltitude: max ..... min ..... Thickness .....

Shape in plan: ..... Orientation: .....

Detailed description & interpretation:

STARTIGRAPHY AND PHYSICAL RELATIONSHIPS

below ☐ above ☐ — Stratigraphic matrix

cut by ☐ cuts ☐

filled by ☐ fills up ☐

supports ☐ leans against ☐ — This context is ☐

same as ☐

Stratigraphy observation:

☐ clear ☐ disturbed ☐ none evident

FINDS

Artifact density: ☐ heavy ☐ medium ☐ light ☐ rare Artifact distribution: ☐ evenly ☐ single-centric ☐ multicentric

Retrieval ☐ Bulk ( all finds ) ☐ selective ( diagnostic artifacts )

Artifact categories: ( Description if necessary )

| Pottery: | Bone ( animal or human ): | Glassware: | CBM: |
|---|---|---|---|
| Iron: | Bronze & cooper alloy: | Conis: | Textiles: |
| Wood: | Leather: | Charcoal: | Stone/lithics: |
| Architectural elements | Other finds categories: | Other organic materials: | None |

SAMPLING

| Environmental sample No : | Sample type ( Bulk/Dendro/C14 ) | Sample Quantity |
|---|---|---|

| Completed by ( signature ) and date: | Checked by ( singnature ) and date: |
|---|---|

Designed by : Saad Ismail - saadismail@hotmail.com

*Fig. 30: An example of a stratigraphic unit form*

station does automatically in your computer. Doing it manually is a tedious and tiring operation but an essential one. The more you manage to do without help from automated aids the more you will

understand about the reality you are excavating. The great poet and observer of reality J.W. Goethe

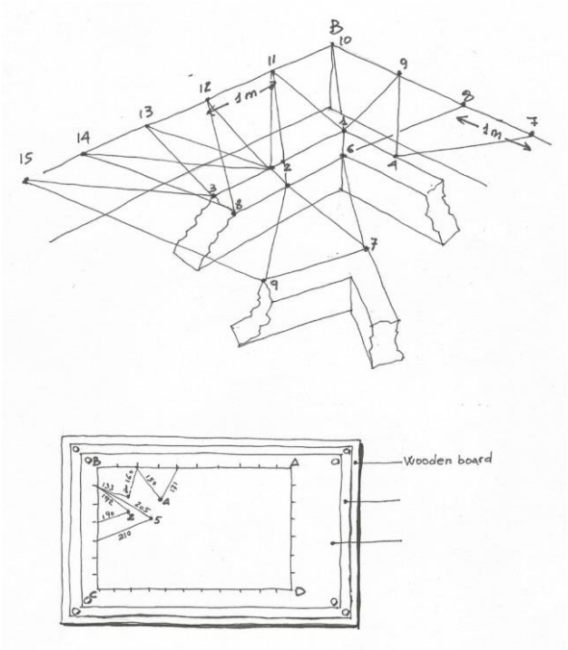



*Fig. 31: From the measurements to the drawing 1*

asserted that “drawing is understanding”. In addition to the sketches with the measurements, especially if someone else or a machine is performing them, get used to making sketches of your structures and strata, whatever the artistic outcome. Drawing will take you to the heart of the matter, you will see it in three-dimensions, will be able to destructure and reconstruct it mentally.

The fact of making a sketch by hand will help you fix the details in your memory.

If you have to sketch details, paving, etc. use the square grid frame, a measurement grid consisting of a square frame on which wires are strung every 5 or 10 cm. You can make it yourself or have it made by a carpenter. Position the square grid horizontally (it can also be used vertically) and reproduce what you see, square by square, or

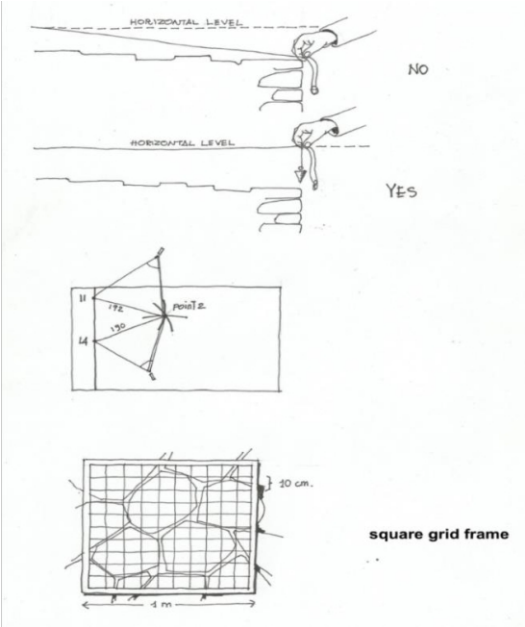



*Fig. 32: From the measurements to the drawing 2*

else photograph them, trying to be as parallel as possible with square grid.

## 11. A few special cases

### a. Spoliation pits

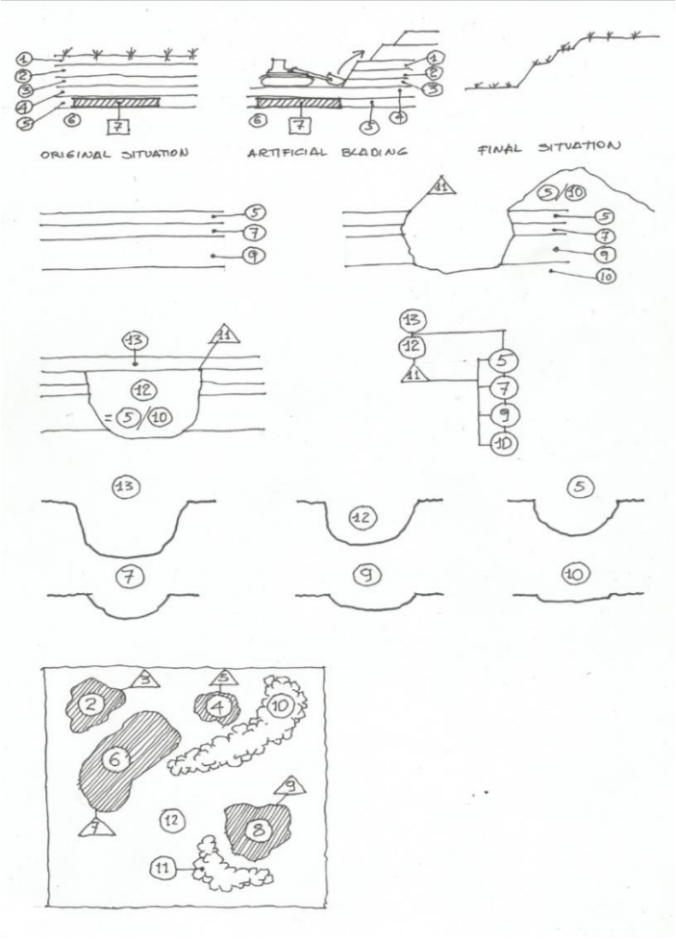



*Fig. 33: Top (first row): artificial modification of the stratigraphy. Center (second-fourth rows): stratigraphical history of a pit and its excavation process. Bottom (last row) instructed by late negative/positive inventions.*

This chapter addresses several specific excavation problems. In this section we deal with robbing pits or spoliation pits (two terms signifying two different destructive approaches: the first is aimed at recovering objects; the second, building materials. To begin with let us briefly see how a pit is dug. During the time sequence a pit has been dug in the ground from a (surface) layer and cuts previous strata; then it is filled in. In the excavation you proceed in the opposite direction and so as soon as you define the outline of a pit on the surface of the layer you excavate it before you excavate the stratum. In detail, in attempting to excavate the pit you are actually excavating its filling as the pit is a negative unit; it cannot be excavated as it is an “excavation” in itself.

Generally speaking, each excavation is plagued with the problem of spoliation pits, especially during the first few weeks, when we are still working on recent stratigraphies. The pits must all be excavated with care. Why? Above all because they indicate a point where the stratigraphy has been disturbed and we need to know exactly what the horizontal and vertical levels are so as to

avoid the materials getting mixed. A second reason is that all time-related evidence is precious. Even agricultural earth moving carried out several months earlier must be recorded. This helps us reconstruct the history of the site, but perhaps also to understand the reason for the absence of stratigraphy linked to an abrupt change of elevation, or else an upheaval lying under an abrupt change of elevation (caused by earthmoving carried out using a bulldozer; see sketch).The following sketch illustrates the various stages in the creation of a pit, and then the process of excavation and documentation and an illustrative scheme of a strata plan with pits and mounds (made by the pit diggers). Here we see how the pits (2)-<3>, (4)-<6>, (6)-<7>, (8)-<9>, and heaps of debris (10) and (11) are excavated before excavating (12).

**b. Graves**

I do not have much experience in the excavation of graves but I have worked with people who do. Methodologically speaking it is important to ignore the fact that the grave is your objective. Do not consider the grave as an object, as part of a

closed context. Indeed, in ancient societies it could be the result of a series of, often very dynamic, processes which, if viewed as being in a closed context, will be lost. If you consider a grave as an object, you will simply dig it up. A grave is a complex structure of which the physical hole may be the least important part. In a simple burial, however, the pit will stand out as the main element but in a kurgan or a pyramid the physical hole will be less important than what surrounds it. In a grave the surrounding part is the part used by

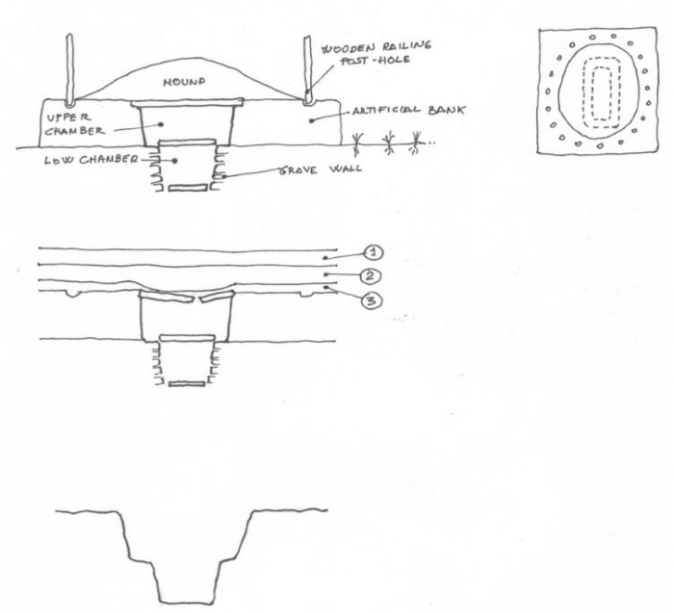



*Fig. 34: The graves and its stratigraphical problems*

the living (re-opened for worship, etc.) In any case, keep in mind that the physical grave must have been originally accessible through a frequentation level, that must have been visible, and might have had an elevation with

monumental features, even if marked only by perishable materials such as a stake and coloured flags; in this case, the only trace the excavator will find is the hole in which the stake was fixed. If you are excavating a grave, you must have a solid knowledge of anatomy and sometimes it is good practice to have the neighbouring strata excavated by a physical anthropologist; wherever possible you will remove the bottom plane with the whole skeleton and excavate it calmly in a covered area. If this is not possible, try to excavate having an anatomical scheme at hand to record the bony parts as they

are excavated, and sieve and flotate the soil (see below).

*Fig. 35: View of area 046 of Mes Aynak site*

Fig. 34 illustrates the excavation of a typical grave starting from an idea of what the imaginary grave was like in the beginning: a double chamber grave; the upper part constructed in elevation, covered by a mound of beaten earth and with a wooden fence around it. Under the superficial layers (1) and (2) we find the clearest layer (3) which corresponds to the collapse of the mound which covers also the artificial bank (4) on which we may find the traces of the wooden railing. On the other hand, (3) is typically found to be darker

in the part corresponding to the grave dug underneath: the change in colour is routinely interpreted by archaeologists with experience in excavating graves as a marker of the top of the grave and is excavated from this point on. In actual fact, as we shall see in the chapter dealing with the issue of strata colour, (3) is darker only as a result of the accumulated humidity which is indeed due to the underlying grave. If he neglects this, the archaeologist opening the grave from this point will not realize that (3) is a collapsed mound covering (4) with stake holes (6)-<5>, (7)-<6>, etc. Having excavated the grave in this way, you will have reduced it to the level of a grave and you will never know the form it had in ancient times (the form we have imagined in the sketch above).

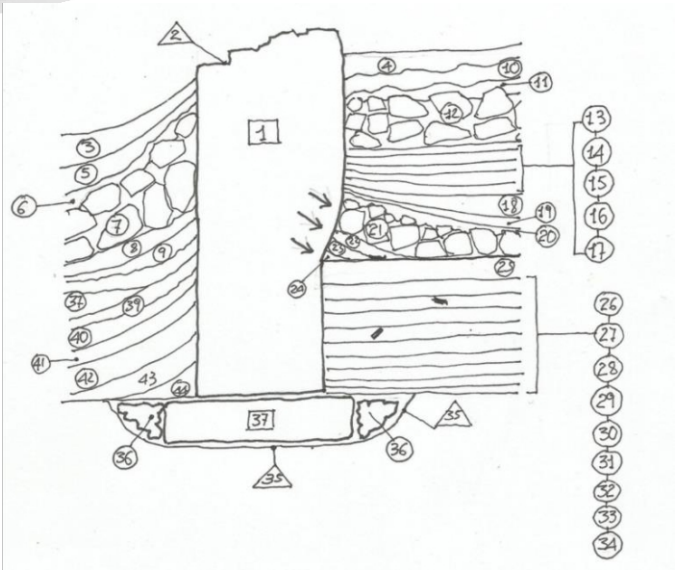


*Fig. 36: Internal/external stratigraphy, floors and masonry failure*

### c. Structures, foundations, surfaces, masonry failures

Much of what is described in this section can be observed and documented following an ethno-archaeological approach. In most of rural Afghanistan building techniques have not changed, mainly because the materials used have not changed. When the latter changed (for instance, after the introduction of concrete or bricks) the techniques changed. In the presence of traditional techniques, the processes of

increase and decrease of structures will be the same as we find in the excavation. Stones and/or clay for vertical structures (or stone foundations inside foundation cavities/pits, with mud brick elevations), beaten clay for floors, increase of floors (overlapping beaten floors) that gradually cover the thresholds and reduce the doorways, door walling and modifications that retain part of the original structure, etc. The structures often have small foundation cavities/pits, subsequently filled with debris produced by masonry work (stone chips, sand, rubble). The foundation cavities/pits must be fully understood and, if necessary, inspected by means of small trial trenches which can reveal to us in advance whether or not they are present. If the wall actually continues beneath the floor, it means that it is obviously older and has been re-used. Near the foundation cavities/pit (along the wall) the colour and composition of the soil will change, since (as explained above) it is the filling of an empty space in which also humidity collects. The internal planes are often made of depurated and compressed clay, these layers with the consistency of leather, of a lighter colour than the

deposit strata. The lighter colour is the result of two concurrent factors: the use of sifted clay and, in the case of courtyards or verandahs, exposure to sunlight. Paved planes in urban environments are almost always external and related to the presence of water (courtyards with wells, for example). The internal courtyards, which contain kitchens and ovens, often have large lenses of (grey) ash with the widespread presence of charcoal fragments trodden into the section of the plane. Sometimes, in the case of cave-ins they are simply flattened and building takes place around them or on top: do not imagine that a collapse represents a totally negative phase: sometimes it is utilized in such a way that the overlying architecture is dependent on it for its formal structure. In these cases we find appreciable increases in elevation, the consequent walling up of doors and the opening of new passages. Doors are often closed with wall sections that are only partially

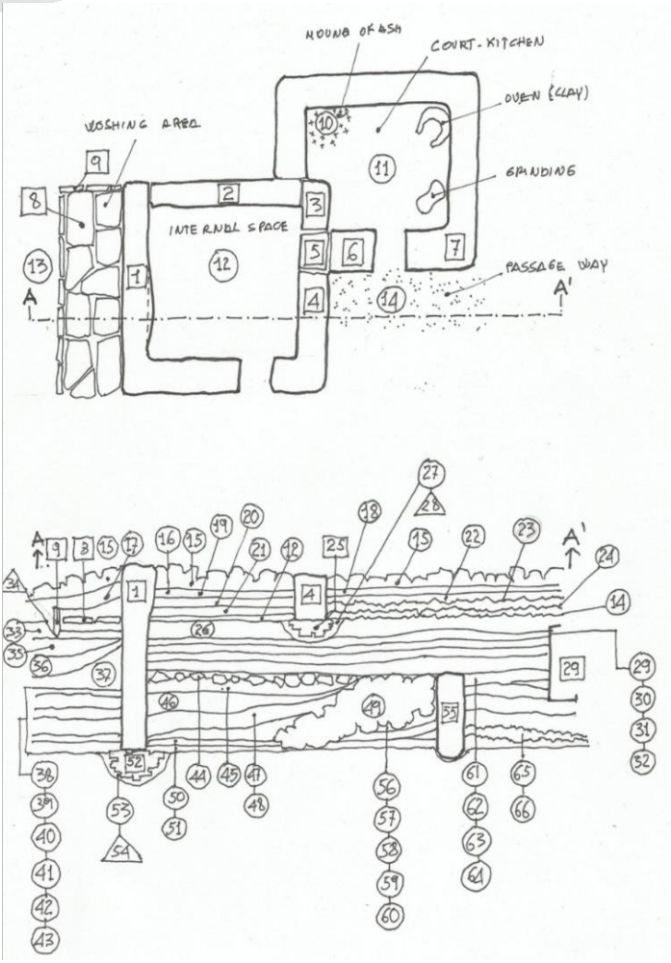



*Fig. 37: Post-abandonment phases (horizontal stratigraphy: plan) and their earlier phases (vertical stratigraphy: section)*

Executed and sometimes completely separated. The street or external paths are characterized by traces of horizontal water flow (streaming) which

exposes and transports the sand and rubble contents and leaches the clay; potsherds are broken up, diffuse, of small size, sometimes leached (with the broken edges rounded off) if lying horizontal to the plane, or else fixed vertically in the plane (due to the trampling activity): in this case they will be smaller and have sharp edges.

Great attention must be paid to bulging and leaning walls. These clearly indicate a collapse phase starting from a given plane upwards and which started when that part of the structure was freestanding: a ruined structure can bulge (collapse) or lean if it has been left standing in a state of abandonment. In the case of dry-wall architecture you will notice in abandoned villages that before leaving them the owners or other subjects will first remove the recyclable materials, especially wood: roof beams, door and window fixtures and doorsteps. These elastic structures are part of the building's skeleton and their removal accelerates the process of degradation, loosens joints and causes collapse. Remember that the construction of a closed dry masonry

building requires, immediately after the foundations, the positioning of door fixtures around the wooden frame of which the mason will build the elevation; the same is true for window frames.

In the sketch you will note the different behavior of the strata in the external areas compared with the internal ones. As far as finds are concerned, let us also imagine that a coin is found in strata (25), (26) and (27). When the coins are found in a layer, as in (27) and (28), they belong to that layer and not to the lower one. Heavy objects move downwards not upwards. Unless of course you are on the surface of the layer: in that case we can imagine that it belongs to the layer supported by (25). Of course, this is true in general: much could actually be said about the concept of interface. Layer (25) could actually comprise a negative interface or surface that is theoretically different from its positive body. It is like saying that the surface of a water body differs from the water below. However, it lies beyond our present scope to address these more technical issues.

In the sketch above we find the following sequence:

**Period I**: foundation cavities/pit of [37] (foundation); construction of [1]. Inside: increase of planes (34)-(26); long-life plane (25).

**Period IIa**: temporary abandonment and subsequent bulging (marked by arrows).

**Period IIb**: collapse (21) of structure with sediment strata beneath the collapse (percolated from above): (22)-(24); phase of final abandonment with thick non compacted strata (20)-(18).

**Period III**: series of anthropic re-use planes: (17)-(13).

Period IV: new collapse (12) and final abandonment.

It is a matter of relating the interior to the exterior: it seems likely that the external area in Period I was occupied by a trampling with successive increase (39)-(43), (44) in the form of mounds near the external base of the wall [1]. In an intermediate phase we again have trampling/passage layers (8)-(10); the collapse

(7) is contemporary with (21) and therefore in phase with the Period IIb documented in the interior. In Period III the external area displays no signs of re-occupation, unlike the interior.

**d. Religious monuments**

So far we have examined how a dwelling structure reacts over time, with its superimposed floors, walling-ups and resumption of walls, etc. We have also seen how an internal space reacts in a different way to an external one, how difficult it is to relate the different rooms, etc. In a settlement site, the phases of transformation, re-use, demolition, reconstruction, etc. follow each other continuously side by side with long abandonment phases characterized by collapses and alluvial deposits that occur above all in the absence of drain maintenance, etc.

None of this is generally found in a religious monument, the structural life processes of which are obviously governed by different laws. The basic law consists of the fact that the monument *per se* represents a factor of immobility. This is what I mean: a Buddhist stupa may undergo

many building phases, interventions and expansions, but will never have the flexibility of a dwelling structure. The floor plane, for example, with stone paving, will be maintained for centuries in that form and swept and cleaned, and as far

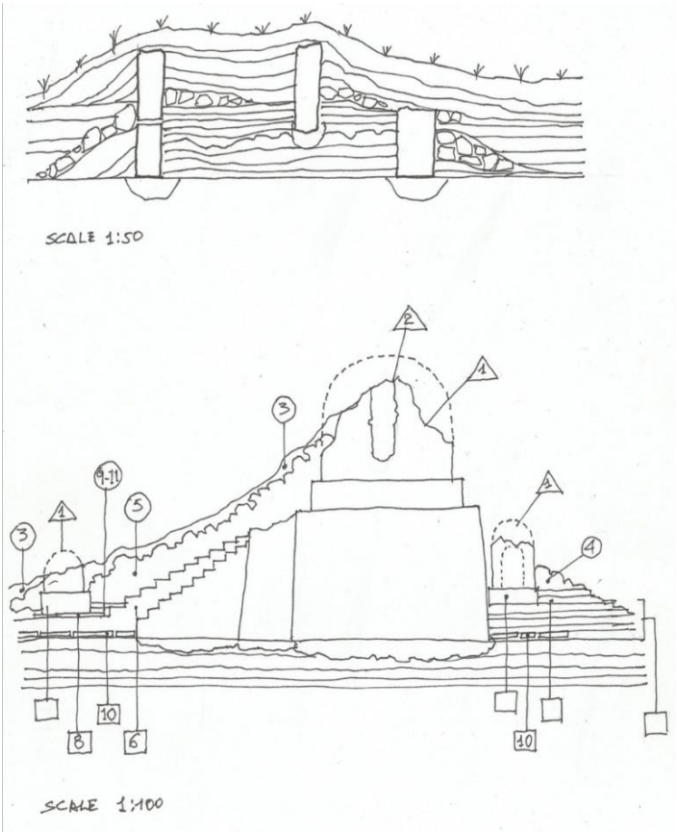



*Fig. 38: Stratigraphical "behavior" in settlements and sacred areas*

As possible cleansed of traces of occupation while the floor of a room is renewed continuously, with its residues sealed under the new beaten earth floor.

By means of two sections the sketch illustrates the different stratigraphic situation regarding two contemporary sites within the same chronological span: one is a settlement area and the other an isolated sacred area.

What changes in the sacred area is the monument, the addition of new chapels and the alteration of the existing ones. Also, the floor will be raised, perhaps two-three centuries after its construction, but by means of the deposition of plaster layers. All these actions

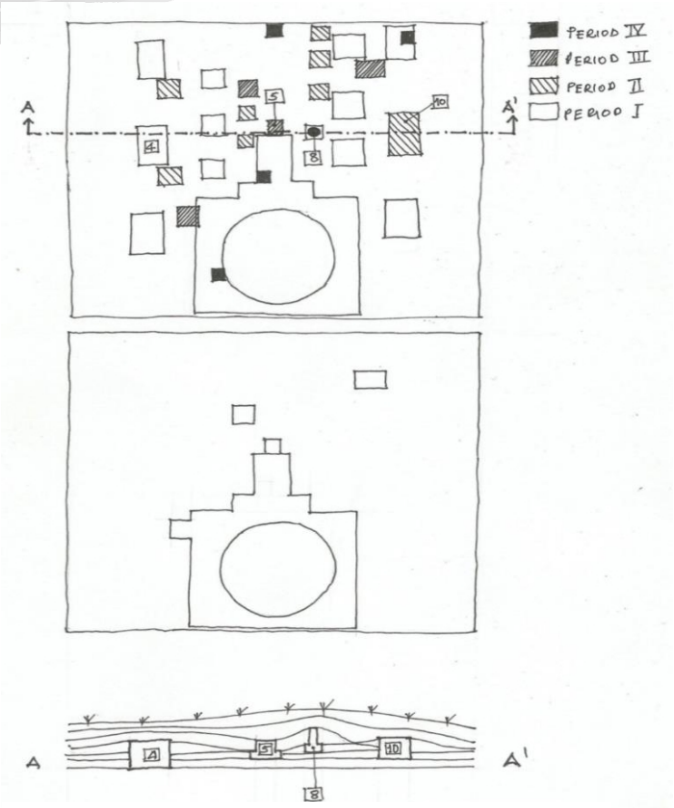



*Fig. 39: Structural Stratigraphy in sacred area*

are aimed at obtaining religious merit, are the result of donations, acts that increase the immutable datum for non-practical reasons. Then there will be collapses, temporary abandonment, re-use. The important fact is that a monument is essentially a sacred place which remains sacred so long as it is considered such by a community, even when time has reduced it to a ruin. A dwelling is not.

The periodization of a religious monument is therefore based more on its structural

interpretation than on its stratigraphy. When it has not been disturbed, the latter may be found to be highly compressed downwards (as long as the monument retains its original features), and highly expanded upwards when it continues to be frequented for the purpose of worship even when it has partly collapsed. Much attention must be focused on the pre-construction and post-abandonment phases, which will provide us with elements of great use in understanding the development of that a-stratigraphic wonder that in many cases is represented by a religious monument.

The first sketch illustrates examples of structural stratigraphy: Period I: [4] is contemporary with the main stupa; [5] and [10] are built on the raised Period II pavement; the votive column [8] is built on the Period III pavement, when [4] and [10] were partly abandoned.

**e. Abandonment phases**

A typically neglected phase in archaeological excavation is that of abandonment. The archaeologist is often looking for something,

sometimes confirmation of a previous hypothesis; he is in any case tempted to go straight to the “good” levels, often neglecting the superficial phases which are deemed to be relatively uninteresting. This is an error of both method and substance. In an excavation, all phases are important and only an overall understanding of them can yield a reliable three-dimensional reconstruction of the site. In essence, it would be like denying that the circumstances of the death of an individual are of any biographical value. The final phases can instead tell us much about the preceding ones. It is always advisable to work extensively: the larger the area the easier it will be to understand the site and the more focused the in-depth investigation will be. Let us imagine we are working in a trench measuring at least 50x50 m inside an ancient inhabited area. It matters little whether its supposed chronology is

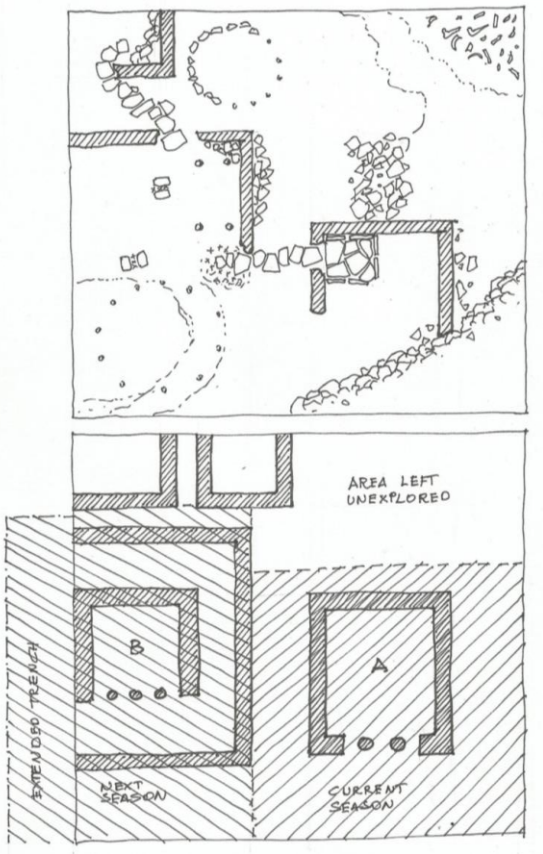



*Fig. 40: Interpreting a post-abandonment phase for the field work planning*

mediaeval or protohistorical. Exposing the abandonment phase over the entire area in practice means being able to carry out a surface reconnaissance and observe what the surface was like at the time of the abandonment, as

though we are on an actual journey in time. Many interesting discoveries will be made. For instance, in the case of a historical period dwelling area it may be noted that abandonment was followed by phases of temporary re-use by nomadic or subordinate groups, and that this phase took the form of a re-adaptation of the already ruined structures. We will find butchering areas, fireplaces, fields, discharge areas which, we will discover, are only partially related to the original functions of the inhabited area. The passages are re-used but animals are butchered in the courtyard of a palatial structure. After the re-use phases have been defined, trying to understanding the abandonment means understanding the technical reasons behind the death of a human spatial agglomeration: observe the collapses and try to understand whether they are due to an earthquake (for instance in the case of collapses all occurring in the same direction or of whole blocks); seek the traces of widespread burning by observing the traces of oxidation/scorching on walls; analyze the presence of large alluvial layers, testing the depth and trying to understand whether they are the

result of flooding (these are often associated with landslips, that is, slow cave-ins or collapses in which the debris accumulates and is not dispersed).

The two sketches represent an ideal situation: an extensive excavation area and an analysis of all the post-abandonment evidence: this requires a thorough interpretation of the outcropping structures and good planning of the work.

After the surface reconnaissance it is decided to concentrate on building A and to leave building B to a later season after leasing an additional area, while the entire N sector is left unexcavated.

*Fig. 41: Excavation of a stupa at Mes Aynak*

## 12. Archaeologist's responsibility: after the excavation

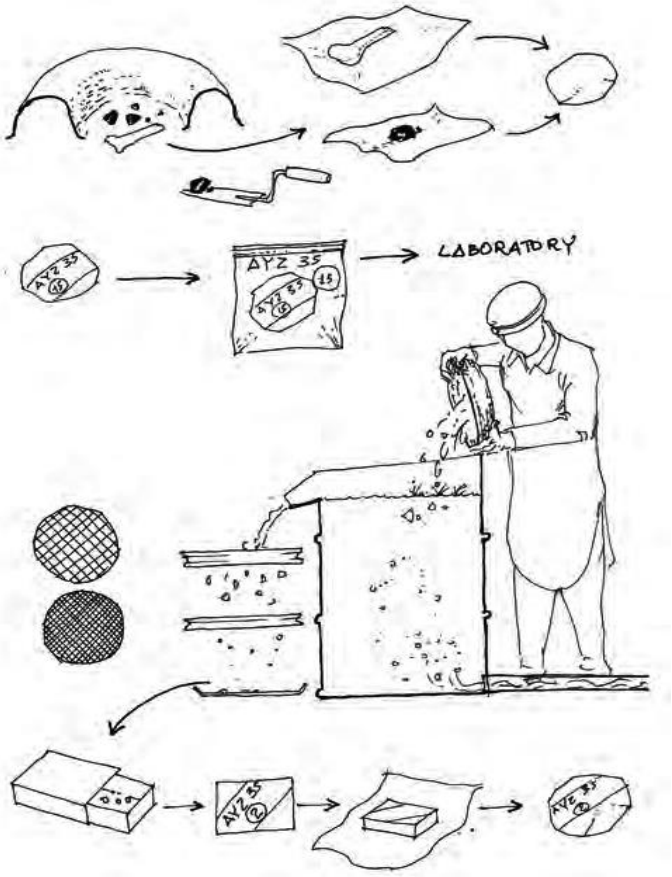
Paradoxically, until a site is excavated it is "virtually" protected. After it has been excavated it must initially be protected by the excavators. You cannot wait until it is automatically taken over by the competent government entity unless something truly important or architecturally significant has been discovered. In purely legal terms, while every site older than 100 years is automatically protected, but practically, especially vis-à-vis third parties, the site must be "notified". "Legal notification" involves a series of steps that take time. Initially, the government entity requests action by the local authorities to define the land registry parcels and ownership, if necessary, also their valuation for the purpose of purchase. Once the cadastral and scientific data have been acquired (site typology, chronology), the State entity prepares the notification which will be published in the official gazette. In the meantime, the signatory to the leasing contract, that is, your team, is responsible for site maintenance, but also for what happens on site, such as accidents, etc. Accident prevention is a must for an

archaeologist performing an excavation involving workmen: a fundamental objective of your excavation is that no one should be hurt. Attention must remain focused also after the excavation: the area must be fenced off and overseen by a team of watchmen. Even after the site has been notified and until such time as the site has been handed over to the government entity you are still responsible for maintaining and it and its surveillance. An excavation must therefore be planned in all its aspects – initial legal (permit), administrative, scientific and again legal (notification and surveillance). It is not permissible to excavate and then leave everything without surveillance in the end. Among other things it has been statistically proven that illegal digging increases exponentially in areas in which excavations have been discontinued and with no surveillance while they decrease with increased legal excavation activity and in the case of excavations under due surveillance. Excavating a site is an exciting activity in which life in the open air is combined with an intellectual challenge. However, a work carried out responsibly will be your most important result.

*Fig. 42: Wall paintings found during the excavation at Mes Aynak*

## 13. Appendixes

### a. Collection of organic samples: flotation and C14

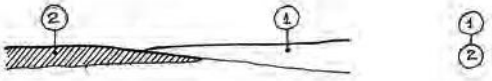



Charcoal, bones, and other organic samples should be handled without touching them directly, and wrapped in tin foil. Each sample will be labeled and put in a (labeled) zip-lock bag.

Floating process: light/organic remains stay afloat and can be sieved; when dry they are collected and labeled as above.

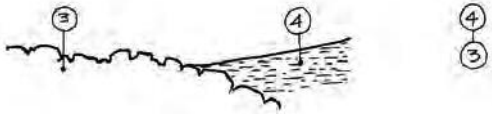
**b. Colour and consumption: the nature of the layer**

The layers are distinguished by colour, composition and nature
(1): compact clay, yellowish, uniform: surface=floor
(2): loose clay, blackish: deposit
(1) covers (2)/(2) is covered by (1)
(1) is later than (2)/(2) is earlier than (1)

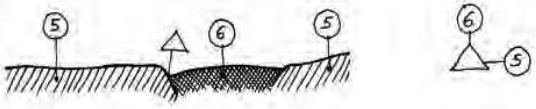



(3) sloping accumulation of stones: collapse
(4) horizontal silty clay, yellowish: alluvium
(4) covers (3)
(4) is later than (3)

(5)



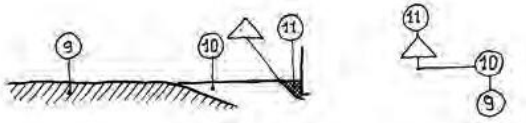

compact clay, reddish: floor
(6) loose clay, brownish: filling of pit <6a>
(6) fills pit <6a>; <6a> cuts (5)
(6) is later than <6a>; <6a> is later than <6a> and (6)




(7) clay mixed with gravel and sand, compact with trace of water passage; with sherds fixed vertically: external surface=pathway
(8) brownish clay, loose with ash: intentional deposit
(8) covers (7)

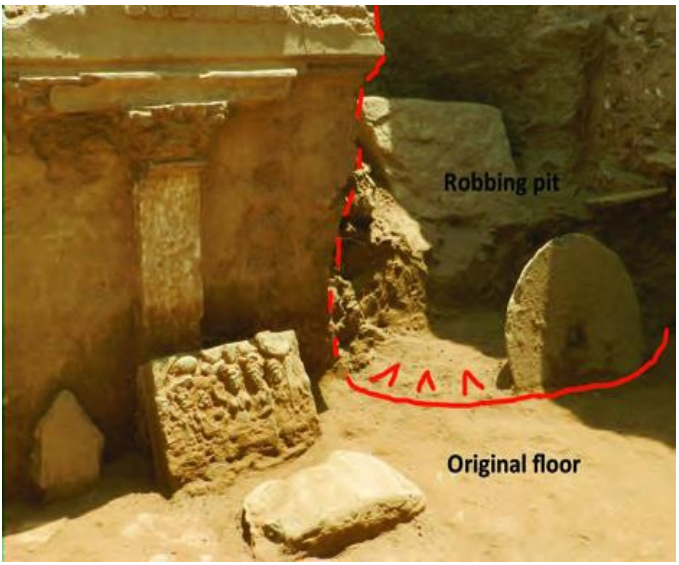

(8) is later than (7)
(9) sloping yellowish clay, silty: external surface

(10) loose clay, yellowish, with sand and gravels: deposit
(11) loose clay with stones: filling of <11a>
(11) fills pit <11a>, which cuts (10), which covers (9)




(11)-<11a> are later than (10), which is later than (9)

Stratigraphic description of Fig. 43 (top: annotated axonometric draft; center: matrix of the wall units; bottom: full matrix): layer (18): surface, covers (17): deposit, post-abandonment, which covers (12): collapse, which is associated to <1>-<2>-<3> (razed wall surfaces) and covers (13): floor associated to [4]=[5]. (13) covers (14) and (15): floors associated to [8] (covered by [4]). Foundation [9] of wall [8] is associated




to wall [7] and to foundation pit <11> cut in (19), filled by (10) and covered by (16).

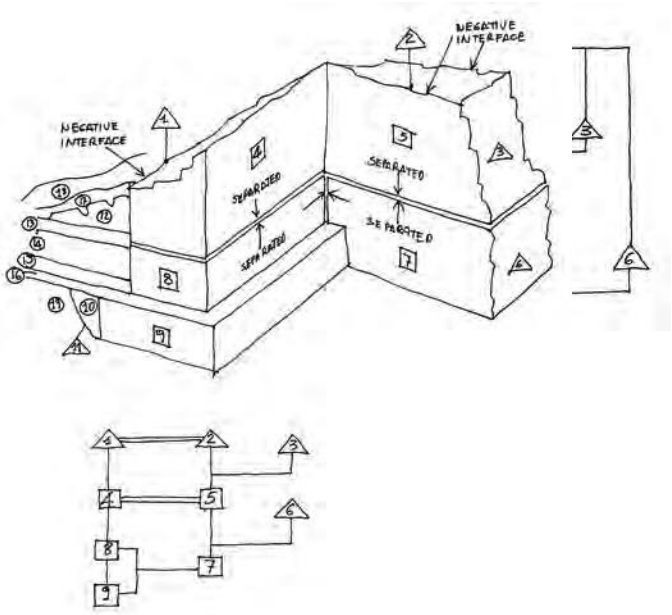



*Fig. 43: A combination of wall structures and foundations illustrated by their structural and stratigraphical matrices.*

## c. Notes on some advanced issues

### Negative Interfaces

Let us spend few words on the concept of "negative interface". In stratigraphy, each physical find (for example a floor, a wall, a fallen column, a layer of car- bon due to a firing) corresponds to a specific event. The sequence of these events in time allows us to reconstruct the

history of a site. But there are events that do not leave similar material evidence. A hole, for example, is defined by its surface and its geometric form; its content or filling is not necessarily con- temporary. In fact, while the pit of a grave, in most cases, is refilled soon after burial, a ditch in front of a city wall may be filled centuries after its first digging. Similarly, the destruction of a wall is witnessed by its broken (razed) upper surface; but its dismantling may have taken place for centuries, from its first collapse to the final, slow phases of crumbling and erosion. For this reason, the negative interfaces (the surfaces of the pit or the broken top of the wall) in stratigraphy are labeled with a specific number, different from those of the filling layers, or of the stones collapsed against the broken wall. An important type of negative interface is represented by ploughing marks. The plough leaves in the soil series of distinctive parallel, v-shaped furrows. Some negative surfaces are not made by man, but natural. For example, when we excavate on a slope, the surfaces are constantly washed and incised by runoff water. Natural erosive interfaces may be

difficult to identify when you excavate horizontally, but easier to see in section.

### Removal of earthen blocks and laboratory micro-excavation

Sometimes on the dig you will find the remnants of complex and delicate objects in perishable materials, or fragile parts of burials that deserve a greater attention and a particularly careful documentation. Often similar finds cannot be left on the field, where they can be damaged by exposure to air and rains. Depending on the type of surrounding sediments and their compactness, these finds can be isolated within blocks of earth, fixed with bandages, gypsum, wax or wooden frames tied up with iron wire, and under excavated while gradually supporting their bottom. Then, such blocks can be lifted and removed, to be brought to a lab to be micro-excavated with the due security and care. Do not under-estimate the complexity of these operations. A micro-excavation in an archaeological lab will require the same stratigraphically approach and recording procedures of normal, larger scale digs.

### Excavating on a steep slope

If you excavate on a steep slope, after removing the topsoil you will see some parallel strips of soil distinguished by different colours or lines of stones. In this case, it is important to start the excavation from the uppermost layer, exposing its inclusions and possible architectural features on its inclined surfaces. In these cases, to excavate by the means of geometric horizontal cuts will mix material of different periods beyond hope of recovery.

### Architectural remains

After removing the agricultural or recent topmost layers, you may uncover the first architectural remains. In this manual reference is often made to the Mes Aynak Archaeological site for its being representative of the Afghan traditional architecture, which employs not only mudbricks or stones fixed with clay mortars, but also pisé (piled mud blocks), rammed earth, fired bricks, with abundant use of wood (poles, planks, recycled boards) and other gross materials as its medium. It is important to observe the present reality, and keep your mind open when you

interpret the archaeological record. Mudbricks and mud walls may be exceedingly difficult to excavate, even more when the walls are collapsed and weathered. Usually, mudbricks are better recognized when their rectangular contours, set in regular rows, are carefully scraped manually with a trowel and contrast with the colour of the mortars and plasters. Experience will make the rest. Post-holes are found as round pockets, usually filled with softer and sometimes darker sediments. Poles may be burnt or have rotten on the spot; more usually, were removed manually and the remaining holes were filled by the surrounding sediments. Excavated carefully, post-holes will reveal their depth, pointed end and the inclination of the shaft. A word of caution: post-holes may be easily confused with rodents' burrows. Dark linear traces on the ground may witness the original location of logs and planks. For further details about earthen heritage and the relevant procedures of excavation and conservation see 14. Addendum.

## Description of layers and site formation process

Archaeological layers are not only “chronological containers”. Their formation is a complex process, in which natural agents like water, gravity and biological activities interplay at length with the work of man. Therefore, stratigraphical processes are culturally determined and as any other artifact can reveal a lot on the ancient culture under study. For example, the slopes of the Swat valley are covered by the remnants of ancient colluvial sheets, formed by the slow sliding of fine sediments coming from the gradual abandonment of terraces of the early historic periods (as shown by the many Kushan sherds they embed). These layers witness a great agricultural exploitation that came to an end before the Hindu-Shai period. In describing a layer, you will first consider the geo- logical matrix, or the finest fraction of the sediment: it may be composed, in order of grain size, of gravel, sand, silt or clay. Then you will look carefully at its inclusions: rocks of different types, form and size, potsherds, charcoal bits, powders and particles of fired clay, pieces and chips of animal and human bones. Matrices and

inclusions, with some experience and possibly the help of a geomorphologist and a sedimentologist, will give a lot of information on what happened at the site. At present, geomorphologist take small blocks of sediments, get from them large thin sections, and look at these soil sections with powerful microscopes, further detailing the original field observations.

### Recording with zenithal picture and AUTOCAD rendering

In many excavations, archaeologists and surveyors nowadays take a set of topographical points by means of a total station. Then they take vertical digital pictures from cameras held above the trench, join the pictures with commercial PC applications, and draw their maps on scale on the photo planes so obtained in AUTOCAD or Adobe graphic environments. Although this procedure is doubtless unexpansive, fast and relatively precise, nothing can substitute the detailed observation that comes together the long observation required by traditional hand-mapping. The problems are 1) you have anyhow to decide which layers and features must appear

together in a phase map, something a machine will never do; 2) you tend to accumulate photo planes that are not interpreted, thus losing the memory and evidence of important details; 3) in the photo- planes, the colours of the layers are not so evident, and many small finds and inclusions are not always visible; 4) when you draw, you discuss colour and limits with the other excavators, while when you digitize photo planes you are alone; therefore, less informed and less critical. The same problems are encountered when vertical sections are recorded with the same technology. The best solution may be a compromise – construct your recording base with these new techniques, but keep the partial maps on the field and constantly update them by adding manually limits and details. Note: Amongst the digital tools available, it may be also worth mentioning the existence of software specifically intended for the creation of stratigraphic matrices (see http://www.harrismatrix.com).

### Sheltering

In theory, we may choose to protect an ancient ruin with a roof shelter. Architects love shelters,

but in practice they can be harmful (the shelters, not the architects!). Shelters need to be anchored to the ground, into the archaeological deposits. Furthermore, after some years you will spend your scarce funds for restoring the shelter. Better restore and maintain the excavated monument. Note: If an excavated site cannot be properly protected (legally and/or physically), enhanced and maintained, the most practical solution will be a fast backfilling of the trench. For more details about sheltering, see 14. Addendum.

### Graves

Graves may be frequently re-opened and re-used for multiple funerals. In this case, besides discovering remnants of more than one individual, you might observe, in plan or in section, evidence of superimposed pits around the mouth of the shaft. By a careful study of the processes of bodily decomposition and of the filling of the central shaft, it will be possible to understand if the grave's chamber in origin was empty, or filled with earth: a crucial aspect of the funerary ritual. We know cases of graves re-used centuries after their first construction: if ignored,

similar practices would place nearby vessels and other artifacts of different periods, confusing your typologies.

*Fig. 44: Excavation at area 98 (Grave yard) of Mes Aynak*

**d. The four laws of archaeological stratigraphy**

A quotation from E.C. Harris (1979) the laws of Archaeological Stratigraphy, World Archaeology, 11, 1, pp. 111-117.

**The Law of Superposition**: in a series of layers and interfacial features, as originally created, the upper units of stratification are younger and the lower are older, for each must have been

deposited on, or created by the removal of, a pre-existing mass of archaeological stratification.

**The Law of Original Horizontality**: any archaeological layer deposited in an unconsolidated form will tend towards a horizontal disposition. Strata which are found with tilted surfaces were so originally deposited, or lie in conformity with the contours of a pre-existing basin of deposition.

**The Law of Original Continuity**: any archaeological deposit, as originally laid down, will be bounded by a basin of deposition, or will thin down to a feather-edge. Therefore, if any edge of the deposit is exposed in a vertical plane view, a part of its original extent must have been removed by excavation or erosion: its continuity must be sought, or its absence explained.

**The Law of Stratigraphical Succession**: any given unit of archaeological stratification takes its places in the stratigraphic sequence of a site from its position between the undermost of all units which lie above it and the uppermost of all those units which lie bellow it and with which it has a

physical contact, all other super positional relationships being regarded as redundant.

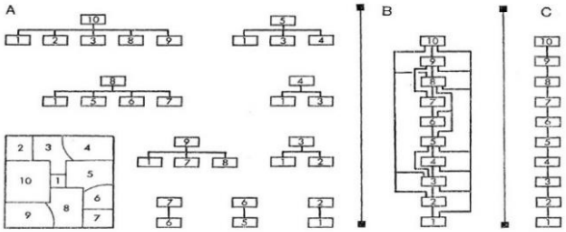



*Figure 1* The superpositional relationships of the plan are shown in A and B. Diagram C is the stratigraphic sequence of this hypothetical site

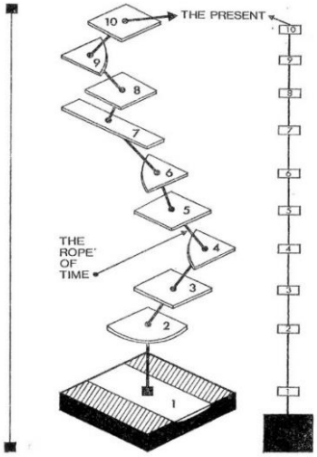



*Fig. 45: An exploded view of the plan to illustrate the deposition of its deposits through time; on the right is the stratigraphic sequence*

## 14. Addendum - EARTHEN ARCHAEOLOGICAL HERITAGE

### a. Earthen structures: background history and archaeological excavation guidelines

The earliest buildings erected by Palaeolithic men were probably huts made of elephant bones and tusks, tents made of animal skins supported by wooden poles, and windbreaks made of light wood and fixed to the ground by rows of stones. Other shelters were directly dug into the ground (subterranean dwellings). By about 11000 years ago, people in the Near East started to build huts and houses (first round, then rectangular) with walls made of earth.

There are several techniques for erecting an earthen wall. In semi-arid zones it is possible that the structures are erected without foundations, directly on the surface, or with a low foundation, sometimes made of stone. In most cases, the first structures to be erected are the wooden frames of doors (and windows). The earthen wall, whatever the technique used, is simply built around the latter.

The simplest technique consists in forming thick and wide layers of pressed earth, firmly set in superimposed rows, sometimes coated with stones and topped by wooden fencing. This technique (often called with the French name *pisé*, or locally *pakhsa*) is amply documented in South Asian regions, both in ancient and modern times, especially for massive structures

*Fig. 46: Rammed earth technique in modern building*
*https://www.pinterest.it/pin/811351689103676377/*

Such as city walls and ramparts. A more complex technique involves the construction of molds made of parallel vertical planks, into which layers

of moistened loamy mud are poured and strongly pressed with poles from above. In the excavation process, walls and platforms thus made, usually referred to as "rammed earth", can be quite difficult to distinguish from those in *pisé/pakhsa*, particularly when the walls have collapsed and the ruins have been long exposed to rain and wind erosion. This technique is typical, for instance, of proto-historic China, where it is called *huang tu*, but it has been recognized even in Pakistan, e.g. in the late Bronze Age megalithic graves of the Swat valley.

Another technique, similar to the one known as "half-timbering" or “wattle and daub”, basically

*Fig. 47: Wattle and daub construction system in the 19th century Razboishte monastery, Bulgaria.*

follows the same procedure, with the difference that thinner blocks and lumps of mud are added on both sides of a wooden frame made of poles and lighter materials such as branches and twigs.

When a wall of this type is set on fire and collapses, the interior of the fallen pieces is likely to preserve the imprints of the vegetal frames. When mud is applied to such frames, archaeologists often conventionally speak of a "plaster". However, more correctly, the term "plaster" should be used only when an outer coat of fine mud is applied to a proper wall.

Mud (sun-baked) brick is the most common building material, from the ancient Near East to the Indo-Pakistani Subcontinent. The earliest known mud bricks were discovered in houses of the earliest Neolithic settlements of Syria, Turkey, Iran and Iraq, and date back to about 9000 BCE. In South Asia, early mud bricks were found at Mehrgarh (Balochistan) Period I, circa 7000 BCE. In every case, these Neolithic bricks often show a peculiar plano-convex shape (flat below,

convex on top). In the following millennia, mud bricks took on their most common form — rectangular in plan and even in thickness. During the Integration Era of the Indus Tradition (approximately 2600-1900 BCE), mud bricks were made with standard proportions (1 in thickness, 2 in width, 4 in length). Thanks to the adoption of such a thoroughly practical solution the planning of houses, streets and monuments became more rational.

Even today, mud bricks are universally used (in some countries they may be called with the Spanish word *adobe*, from Arabic *aṭ -ṭ ūb*). Very often they are bedded in mud mortars and covered with an outer layer of plaster. Mud bricks are made up of clay and silt, with the addition of sand and chopped chaff. The best, most durable mud bricks have percentages of clay between 25 and 45%. In fact, clay gives strength to the bricks but, in excessive amounts, would make them shrink and crack upon drying. Second choice mud bricks are richer in silt and sand.

In general, the study of ancient buildings reveals that the composition of mud bricks often varies over time. The specific composition of mud bricks, *pisé* or *pakhsa*, can be studied by sedimentology (the scientific study of sediments, or deposited earth).

In many cases, different earthen construction techniques are used in the same building. For example, it may happen that *pisé*/*pakhsa* is utilized for outer walls, since it allows the erection of wide massive structures (see e.g. the first phase of the outer wall of Site 003 at Mes Aynak), while mud bricks are used for inner (and thinner) structures, and for more elaborated architectural parts, like vaulted corridors, arches, etc. (see again the same site at Mes Aynak.

*Figs. 48-49: Different construction techniques at Mes Aynak: pakhsa and mud bricks*

Once buried under archaeological sediment, earthen buildings are generally difficult to locate and excavate, since walls and other structural

features are not easily distinguishable from the debris composed of the same material. When an earthen building is abandoned and loses its roof and wooden structural features (e.g., the wooden frames of doors and windows), the walls rapidly decay and start to crumble due to rain, winter's freezing temperatures and summer's heat, while the moisture absorbed from the ground undercuts the walls from below. When a mud-brick wall collapses, indeed, its components fall down and break chaotically; in the course of time, rain and wind will melt the debris, and the resulting material will fill the empty spaces with fine pockets and lenses of the same base material as the broken components. As a consequence, you have to be quite careful while excavating these kinds of deposits, which cannot be removed by using picks, but only with trowels.

The upper surface of such collapse layers must be recorded, brick by brick, or piece by piece, like any other layer. After removing the collapsed bricks or components, the top of the surviving walls will be encountered and the architectural lay-out will be revealed by the regularity of

aligned courses of its components, as well as — at least in some cases — by the thin, regular grids formed by the inner mortars (usually distinguished by a lighter colour) and by the continuous outer coat of plaster.

Another complex issue related to the excavation of earthen structures raises when one approaches the floors, i.e. the lowest level of the structure. In some cases (as recently documented in Mes Aynak, for example), the bottom of the earthen walls was originally reinforced on the outer side by a low stone escarpment, which was meant to protect the base from erosion. If the escarpment is not properly noticed (in most cases it is reduced to a hotchpotch of pebbles), one runs the risk of over-excavating *below* the base. Useless to say, over-excavation can seriously weaken an earthen structure, which may collapse soon after exposure. To avoid such risks, it is recommendable to a) excavating carefully; b) individuating the floors (many superimposed floors may be associated to the same phase); and c) trying to get a good understanding of the layout

of buildings and structures' elements during the dig.

Earthen architecture, if left exposed to the atmospheric agents, will start decaying and crumbling to dust in a short while. The possible solutions are: a) re-burying the ruin (highly recommended as a cheap and safe option, but in this case the building will be hidden from public view); b) re-burying the ruin, after covering the top of the walls with mats, and reconstructing on surface a new layer of mud bricks or *pisé*, thus signalling the architecture on behalf of visitors and tourists (a good solution, but make sure that you will be able to replace the new surface layer every year); and c) covering the exposed walls with mats and applying a layer of mud on top of them (this is also a good solution, but in this case, too, the mud layers need to be re-applied every year).

Remember that, in the course of time, shelters built on top of archaeological ruins ultimately will fasten erosion and become ruins themselves, and you will be forced to spend your scarce

money to restore the shelter instead of taking care of the monument. For this reason, modern shelters such as concrete, glass and steel roofing should be used only in exceptional cases. Also, do not trust foreign "experts" who might propose you to test the application on the walls of industrial chemicals or other heavily-impacting processes. You had better follow the above-mentioned solutions b) or c), and use only local, cheap materials that can be easily replaced, involving in the maintenance the local communities.

**Concluding remarks**

Earthen architecture is generally considered intrinsically weak and materially modest, and perhaps there has been little effort made to develop conservation methods for archaeological remains of this nature. And yet, imposing relics survive of large-scale buildings made of clay (e.g. the monuments of Kuh-i Khwaja in Iran, the Taq-I Qisra of Ctesiphon in Iraq, the Palace of Lashkari Bazar in Afghanistan, the architectures of Chan Chan, in Peru, just to mention a few). These monumental, highly sophisticated

constructions, which were planned and built for wealthy individuals and societies, demonstrate that earthen architecture was not merely a simple and affordable expedient, but a rational choice based on cultural and technological reasons, and that the use of clay did not pose any constraint on the grandiosity, formal rigour and structural performance of ancient buildings.

Earthen architecture — with a number of technical variants — is still an important construction method in many countries. A world-wide interest has recently developed, due to the recognition of the unique properties of clay building materials, which generate a low impact on the surrounding environment and a good response to environmental hazards such as earthquakes.

*Fig. 50: Contemporary adobe house in New Mexico*
*https://www.pinterest.ca/pin/370984088034019629/*

The socio-economic importance of clay is thus rapidly increasing, and the prospects of obtaining from clay new industrial and eco-friendly materials are being explored by modern

technologies. Besides the positive effect on the environment, we can also expect from these new scientific approaches and technologies that more suitable conservation strategies for ancient clay buildings will develop in the near future.

*Massimo Vidale*

**b. Earthen artefacts**

During excavation special precautions must be taken to secure fragile and vulnerable finds. This is a particularly crucial issue in Afghanistan, where archaeological sites abound in earthen artefacts such as sculptures (generally painted and/or gilded), wall paintings on earthen plasters, architectural decorations in relief and so on.

**Sculptures**

An earthen sculpture is generally composed of an inner armature – usually made of wood or bundles of twigs tied together with rope – around which sculptors roughly modelled the figure by means of a thick core of earth. This core, in turn, was covered by one or more earth layers which refined the shape, giving the body and the drapery folds their final form.

A thin coating of refined clay was then applied to smooth the surface and make it suitable for receiving paint and/or gilding.

The sculpture, if modelled against a wall, either as a bas-relief or a high relief, was probably also anchored to it with one or more mechanical constraints such as wooden sticks, which were inserted into the masonry. As with many naturally formed organic materials, wood is subject to decay. Therefore, it frequently happens that wooden supports have completely disappeared, leaving a cavity inside the sculpture and/or in the wall. These surviving negative traces must be duly documented

*Fig. 51: A head from Tapa Sardar showing on the rear face the superimposition of layers and the imprint left by the inner structure*

*Fig. 52: Mes Aynak, sculptures showing the inside cavity left by the inner armature*

as they may provide important information about the original shape and setting of the artefact.

Both the sculpture and its background — be it the back wall, a niche or even the step or pedestal that supports it — are often decorated in relief

*Fig. 53: Mes Aynak, feet of disappeared figures, with cavities showing the partly burnt remnants of the wooden armature*

*Fig. 54: Tapa Sardar, Throne 9, showing the decoration made of applied elements*

with applied elements such as flowers, small figures, ribbons, drapery and so on.

In addition, the background is usually painted. The earthen sculpture is therefore a composite artefact that presents many challenges due to the inherent fragility and vulnerability of its different components, often associated to a considerable weight.

The conditions of the sculpture should be checked as soon as possible in order to ascertain whether it is still in its original position, if it is

stable and whether the removal of the enclosing soil deposits may put it at risk of partial or complete collapse. If possible, also the adhesion between the different layers should be assessed without delay, from the cohesion between the wooden (when preserved) and earthen materials up to the cohesion between the sculpture and the finishing paint layer, the latter being often the subject of flaking or powdering phenomena.

The presence of an earthen sculpture embedded in the archaeological soil deposit is indicated by the appearance of the paint layer or, in the absence of the latter, by a difference in soil texture or colour. After the identification of the interface between the artefact and the archaeological soil deposit to be removed, most careful and selective digging methods must be adopted so as to remove or reduce extraneous materials without damaging the outer surface of the artefact.

In order to prevent damages during excavation, the use of hard tools such as picks, trowels and shovels must be avoided in the immediate vicinity

of earthen artefacts. Indeed, once an earthen artefact has been located, an immediate change to softer and handy tools is required. Removal of soil around the sculpture should be done with scalpels, spatulas or even wooden sticks, without trying to completely clean the surface or empty the undercuts.

By means of targeted limited tests, it would be recommendable to preliminarily assess both the shape and size of the sculpture. Regardless of whether the sculpture has to be removed or restored on site, a layer of soil should possibly be left on it, in order to protect its surface from the destabilising effect of excavation and exposure. In addition, this protective measure reduces the need to apply consolidation products during the first phase of the discovery.

During or immediately after the excavation, it is necessary to protect the artefact from the surrounding environment, since the exposure after the long burial is generally a cause for great stress. The earthen artefact must be protected from rain — and in general from water infiltration

— because, being very sensible to changes in humidity, it could swell or even melt away. Also direct insolation or high temperatures are dangerous, as the material generally shrinks if too dry, thus causing the sculpture crack or crumble.

Therefore, it is essential to create around vulnerable artefacts an environment as stable as possible, safe from wide and sudden thermo-hygrometric variations. In addition to a waterproof roof, the shelter should also be provided with walls or other vertical protections in order to insulate the sculpture from winds and create a more stable microclimate around it.

Conservation/restoration of these kinds of objects is a specialized job. Operations such as structural and surface consolidation, surface final cleaning, and aesthetic presentation must be carried out by field professionals. However, in the absence of an experienced field conservator, the archaeologist is required to deal with the first conservative problems during the course of excavation.

Ensuring the stability of the sculpture, even if provisionally, is the first precaution to be adopted.

In order to prevent unbalancing of the sculpture, support props or containment bands must be devised, taking care of distributing the pressure over the widest surface area so as to avoid the risk of stressing fragile parts. In addition to avoiding the complete removal of the enveloping soil at least from the folds of the sculpture, the use of paddings and bandages is recommended to hold together loose or crumbly parts.

The packaging materials, such as foams and fabrics, can be placed directly in contact with the layer of soil that still covers the surface, if any. Conversely, if the surface of the artefact has been exposed, it must be isolated by the packaging material by interposing a protective membrane. Make sure that the membrane satisfies the following requirements: water vapour permeability, ability to gently follow the surface contour of the object, and a smooth, non-abrasive surface that does not create adhesions with the original materials of the sculpture.

If the surface is exposed and in bad condition, localised consolidations should be carried out as

a first aid procedure. In such cases, it is recommended to always involve conservation experts and test the restoration products before using them directly on the artefact. Consolidating a raw earth object is a rather delicate and difficult task, for chemical products easily stain on porous materials. A further risk is generated by the very limited penetration of the consolidating products. This creates on the surface a film that ultimately may cause exfoliation of the external consolidated layer. It is therefore recommended to use adhesive or consolidation products only when strictly necessary, at very low concentrations and just enough to get the required result. In addition to applying minimal intervention, only reversible products and procedures should be employed.

During excavation and first aid intervention it is extremely important to accurately document, both in photographic and graphic form, the original condition of the artefact and all conservation actions that have been carried out. All these pieces of information will be later necessary to

plan the full-scale conservation-restoration intervention.

The destination of the artefact is a further important matter to settle as soon as possible. Keeping archaeological artefacts in the place where they have been found is absolutely the best option. The removal of a sculpture, which was originally conceived as complementary to the architecture, may cause a significant loss of cultural value for both the artwork and the context it originally belonged to.

In the absence of a scheduled conservation-restoration project and/or a site managing planning, the backfilling should be considered as a possible option to guarantee a safer conservation in the medium/long term, even if such a procedure entails completely hiding the artefact. The adoption of this protection measure does not imply the re-burying of the whole room where the sculpture is found. It will be sufficient to create a vertical structure around the sculpture (or around three sides if the latter is attached to a wall). This can either be a wooden structure or a

masonry structure. The empty space between the artefact and the bulkhead has to be filled up with earth or sand or a mix of both, after interposing a protective and horizon-marker membrane between the sculpture — possibly still covered by a layer of soil deposit — and the filling material.

As already stressed above, the removal of the sculpture from its original position and its transport to another place must be undertaken only if absolutely necessary. Actually, there is no standard method for this operation, since every artefact has its particularities. For example, it may have a very irregular shape, it could be too big or in too poor condition, or there might be insufficient operating space around it, and so on. Any removal and transportation operation must be designed individually and special care must be taken to minimize vibration or more severe mechanical shocks. Whatever operation is devised, it is essential to accurately plan it and assemble the needed tools and materials before work begins, since the lack of any simple item during the lifting process may cause irreparable damages to the artefact.

A generally valid recommendation is to distribute as evenly as possible the mechanical stress being imposed upon the artefact. If possible, the artefact should be 'block-lifted' from its original location. This technique consists of removing the sculpture in a block together with the surrounding soil to minimize destruction and facilitate the recovery of tiny pieces. As an alternative, after a first intervention of stabilization and protection of the sculpture, a comparable, possibly lighter block can be created around the sculpture to be lifted. For example, if the sculpture to be removed is not excessively large, a box can be constructed around it. A rigid (e.g. wood) vertical frame must be placed on the four sides and beneath the sculpture that has been preliminarily isolated on a platform of soil. The lower part of the box must be carefully and gradually slid underneath the platform of soil as the undercutting of the latter progresses. Once put in place, the sides of the crate must be secured with the fastening system (screws, cramps, straps of metal or any other similarly strong material) that is most appropriate for the particular situation. The empty space in

the crate must be filled up with foams or any other suitable padding that may gently but firmly follow the contours of the sculpture, in order to prevent it from rattling about.

The great complexity of these operations and the associated risk of damaging both the artefact and its original setting during the removal process require not only a careful planning and correct equipment, but also a team of experts who can provide all the skills required to tackle such a technically complex and demanding task.

Furthermore, one must keep in mind that a rapid removal of the artefact from its resting place may imply sacrificing intact archaeological deposits in its vicinity and/or may prevent a full understanding of both the relational meaning of the artefact and the meaning of the whole context. Therefore, and particularly in contexts such as Afghan archaeological sites, which are likely to yield fragile artefacts in great amount, it is necessary for archaeologists and conservators to develop critical knowledge and awareness of

how to devise compromise solutions that fulfil both research aims and conservation strategies.

**Wall paintings**

Also when the archaeological dig exposes wall paintings, it is necessary to rapidly adopt specific measures that guarantee the safety of the artefact during and immediately after the excavation. The required operations are as delicate as those prescribed for sculptures, although sometimes they can be less complex.

Following a traditional technique, the painting is usually laid on a support plaster (in most cases consisting of a mixture of earth and vegetable fibres) applied to the wall. Sometimes, an intermediate earth-based layer was laid in between to even out the wall surface. Generally, the plaster surface was further regularized and made smoother by a thin layer of clay. It is also possible that a preparatory layer of light or white colour, often plaster, was applied as a base for the execution of the painting. The painting was then executed by superimposing colour layers

that were often prepared with a binder of organic nature.

The painted surfaces are generally flat, slightly wavy, and follow the contour of the supporting structure. In the same way as recommended for sculptures, once the position of the painting is identified, extreme care must be taken to remove the last layer of deposit with scalpels and other precision tools. A few millimetres of earth deposit should be left on the surface, using very limited testing to identify the extension of the painted surface. It must be kept in mind that the colour layer is likely to have become dusty, due to a weak or deteriorated binder, or flaking, due for example to the loss of consistency of the preparatory layer. In either case, the operation of thinning or removing the earth deposit from the paint layer can easily cause the loss of part of the colour.

During and after excavation, it is essential to protect the wall painting from atmospheric agents. As an immediate measure, it is recommended to put up an emergency shelter in

order to stabilize humidity and temperature of the air around it.

Either on-site conservation or detachment and transfer operations are specialised activities that cannot be undertaken without the presence of a conservator. However, to minimise problems that may arise during the course of excavation, it is of crucial importance that excavators know about preventive conservation measures.

If the earthen plaster layers appear detached from the support wall and risk collapsing, first aid operations should be carried out by installing pressure props on padded boards to hold them in place. In the same way as recommended for earthen artefacts, localised surface consolidation that imply the use of chemical products must be carried out only if necessary and, if necessary, it must conform to the principles of minimal intervention and reversibility.

Removal of painted plasters from their original location should be absolutely avoided and every effort should be done to safely preserve painted surfaces in situ. If this is not possible, the removal and transfer of a painting must be carefully planned and carried out by professional conservators. Furthermore, since detachment and transfer are very delicate operations, the planning must also include an appropriate aftercare strategy.

*Fig. 55: Mes Aynak, a cotton gauze applied to a mural painting before detachment*

As a general rule, painted plaster cannot be detached from the support wall without being protected and held together by a facing (cotton gauze glued to the surface).

Also, it should not be cut into pieces except along existing cracks and gaps, especially if a few millimetres of earth deposit have been left on the surface (as recommended above) and the painted layer is not yet visible. Pre-consolidation is required if the paint layer shows poor adhesion to the underlying preparation layers, for in such cases without a pre-consolidation treatment the colour is likely to peel off the plaster and remain attached to the gauze.

Needless to say, the adhesives used for facing should be easily reversible without using water. It is also recommended that the facing is removed as soon as possible by specialists in a well-equipped conservation laboratory. As repeatedly stressed throughout this chapter, removing artworks from their original context should be considered a last resort, because it irremediably splits historically meaningful units and may cause

a severe loss of valuable data. Therefore, if removal is the only viable solution, appropriate and detailed documentation (in both graphic and photographic form) must be provided of the original position and condition of the artwork, as well as of every step of the conservation interventions. This will safeguard the informative potential of archaeological objects and will make it available for future studies.

The frequent necessity for emergency excavations does not make these principles useless. On the contrary, it makes them all the more important.

*Livia Alberti*

## c. The role of documentation in revivifying the past

If excavation brings back to light the material evidence of the past and restoration saves physical objects, documentation secures the possibility of transmitting their memory across time and, in many cases, reconstructing things no longer extant.

Architectural and sculptural decorations basically obtained from clay pose specific challenges to archaeologists. As a necessary consequence, archaeologists working in sites where the use of clay prevails must consciously take up these special challenges and adopt simple but efficacious documentation procedures in real-time, while digging, in order to allow the full informative potential of the excavated objects and structures to be exploited in post-excavation analysis and dating processes.

Objects and structures made of clay may partially or completely crumble in dust over time, but usually sufficient traces remain for archaeologists to get an overall picture of the original layouts.

The greater or lesser probability of such a goal being realized depends not just upon the greater or lesser degree of physical preservation of the archaeological contexts and objects we are excavating, but upon a rational and systematic pursuit of information.

It is essential, therefore, to activate proper documentation procedures at the very beginning of the excavation, following the guidelines illustrated in Chapter 12. Do not rely on your memory: it fades soon and becomes confused with other events. There are no substitutes for notes generated through immediate presence at the moment in question, from first-hand experience and observations.

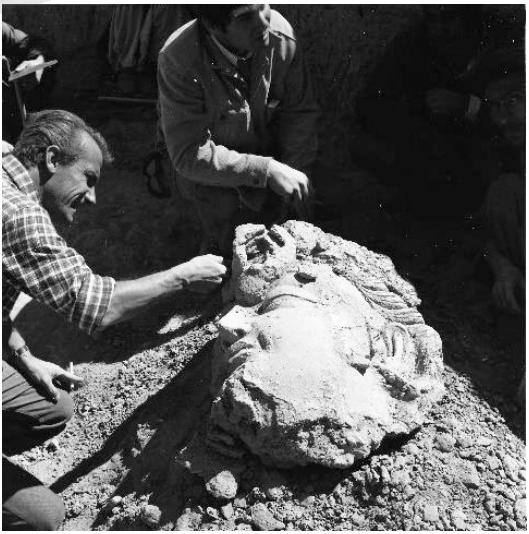


*Fig. 56: Tapa Sardar (1969), consolidation work on a colossal head lying on the ground*

A proper documentation of the contextual setting of each and every artefact is a key step. Use photographs, field books and sketches to rapidly fix a key identifying description, measurements and find spot. In this way, you will create true integrated data sets which will be available for later analysis, not only to yourself, but also to others in the future. Attention must be paid not only to the more macroscopic and intelligible remains but also (and moreover) to the minute and apparently insignificant fragments or detached elements. One must remember that a

nontrivial role in the ancient sculpture and architecture in clay was played by separately moulded details that, once applied to figures and walls, gave the latter their final and individual shapes. Statues of medium to big size, especially, were customarily completed by adding elements such as locks of hair, ornaments and attributes of various kind, whose shapes may follow specific patterns which are proper to certain characters and may therefore prove key in identifying the iconographic subjects. Also, sculptures were generally modelled in high relief around a wooden skeleton fixed to the walls by means of tenons to secure their stability. However, heads, arms and/or hands, mostly executed in full- or nearly full round, are frequently jutting out of the compact mass of the body and therefore, once the site is neglected or abandoned, they are likely to break and fall down.

The processes and stages of decay, erosion and ruination are influenced by varying circumstances. Let's consider the case of a clay statue. The archaeological recovery of intact figures is exceedingly rare. Also rare is the

recovery of broken statues that can be nonetheless fully reconstructed from fragments perfectly joining each other. Usually, only parts of a figure survive in situ; other parts will be missing because they had already crumbled in the past, either in dust or in very small fragments that cannot any longer be recomposed. Other fragments, though detached and fallen, still retain a compact and legible form; this is often the case with heads, hands, attributes and small decorative plaques, which were usually made of more refined and harder layers of clay. However, one cannot expect to find all the surviving fragments of a statue lying in close and orderly arrangement on the original floor. Typically, the process of decay occurs in several stages, most often following the partial collapse of the building the statue was enclosed in, and the surviving fragments are mostly found embedded in collapse layers. Thus, it frequently happens that fragments of one and the same sculpture come to light at different heights within the accumulation deposit and at different moments in time during the excavation process.

The description, measurements and finding spot of the fragments are precious hints to their original position, clustering and possible mutual connection, and will enable us, in the post-excavation analysis, to piece together a much more comprehensive and reliable picture of the original layouts.

Once the association of isolated fragments from a single monument is established, we will be able to reconstruct and understand the nature, appearance and meaning of the original artefacts. Moreover, even if the fragments cannot be physically re-joined, they can often be recomposed in virtual reality. As already said at the beginning of this paragraph, documentation must include any slightest trace of artefacts. Archaeologists must investigate not only what is preserved, but also what has almost disappeared, in order to gain as full a picture as possible of the original contexts.

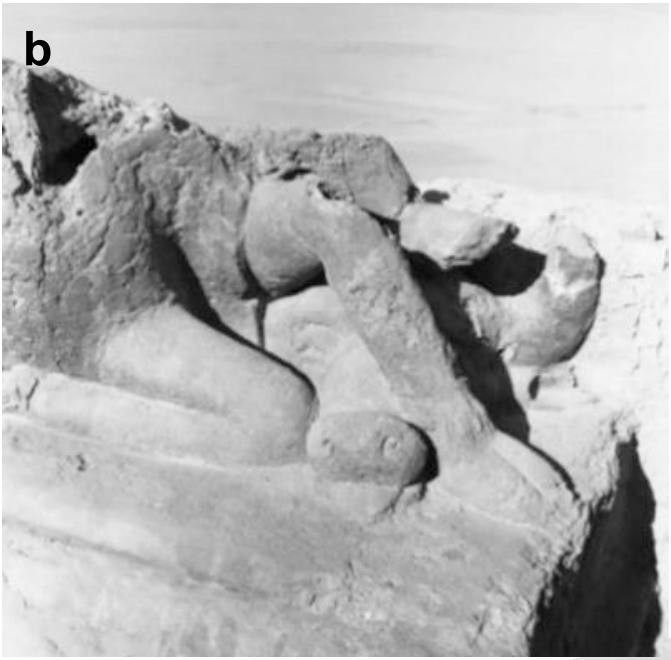
As we will see, minimal extant evidence may suffice to identify a lost artefact. Moreover, a careful archaeological documentation makes it

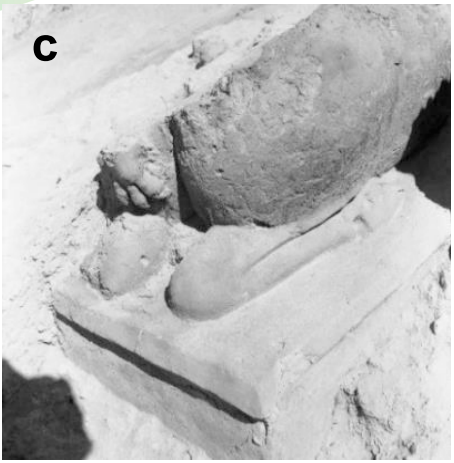
possible, even after decades, to work out reconstructive hypotheses about the original form of partially lost artefacts and to better understand their physical and cultural contexts.

To illustrate the above directions practically (Pls. I-V), let us refer to two examples drawn from the Buddhist site of Tapa Sardar, near modern-day Ghazni, which was excavated by the Italian Archaeological Mission of the ISMEO in the 1960s and 70s. The site (2nd/3rd to the 8th/9th century CE) was composed of several cultic areas – and probably a monastery as well – arranged on artificial terraces at the top and down the slopes of a hill.

The two colossal sculptures illustrated here belong to the Late Period of the site and can be dated to the late 7th/early 8th centuries CE. They were originally placed against the side walls of one the lavishly decorated chapels (namely, Chapel 23) which surrounded the Main Stupa: a bejewelled Buddha (on the left wall) and a multi-armed figure of the goddess Durga killing Mahisha – a demon disguised as a buffalo (on

the right wall). Of these colossal sculptures (nearly 4 m high) only a few pieces have survived.



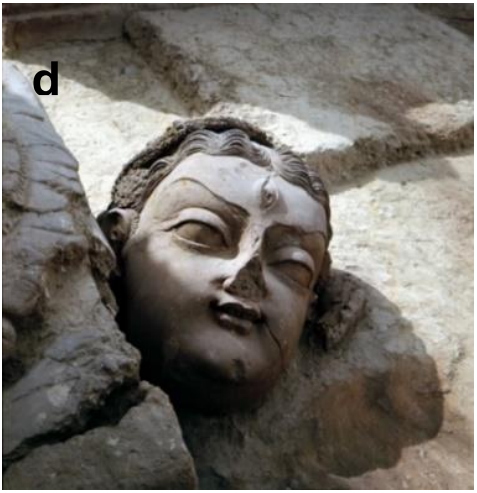




*Plate I: Extant parts of the colossal Durga from Tapa Sardar (not in scale):*
*a) The socle preserving the decapitated body of the buffalo*
*b) Front part of the buffalo's body showing the severed head of the animal*
*c) Rear part of the buffalo's body showing a paw of a lion (the goddess' animal vehicle)*
*d) Durga's head*

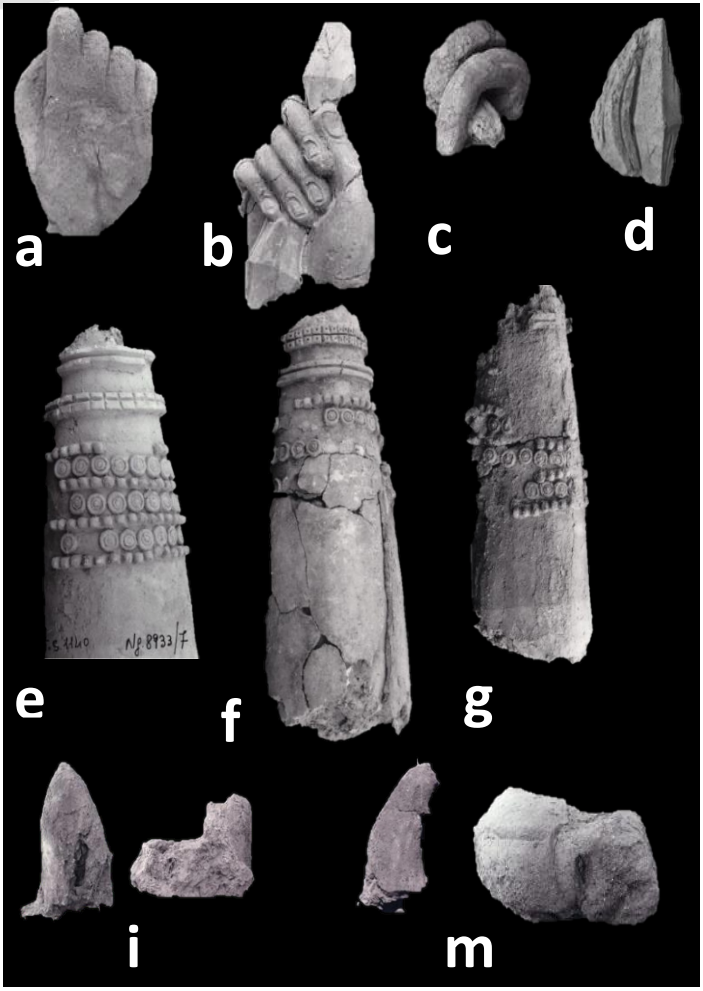
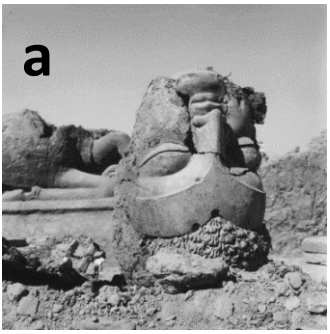



*Plate II: Extant parts of the colossal Durga (not in scale):*
*a, b, c) Durga's surviving hands; d) A fragment of the trishula (c of the goddess' weapons)*
*e, g) Durga's surviving forearms; h, i, l) Ear and horns of demon Mahisha*
*m) A fragment of a lion's head*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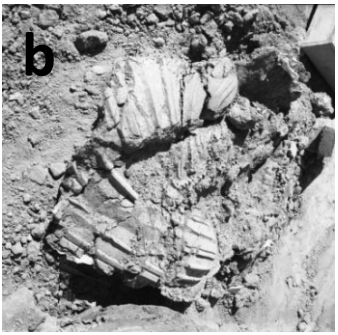
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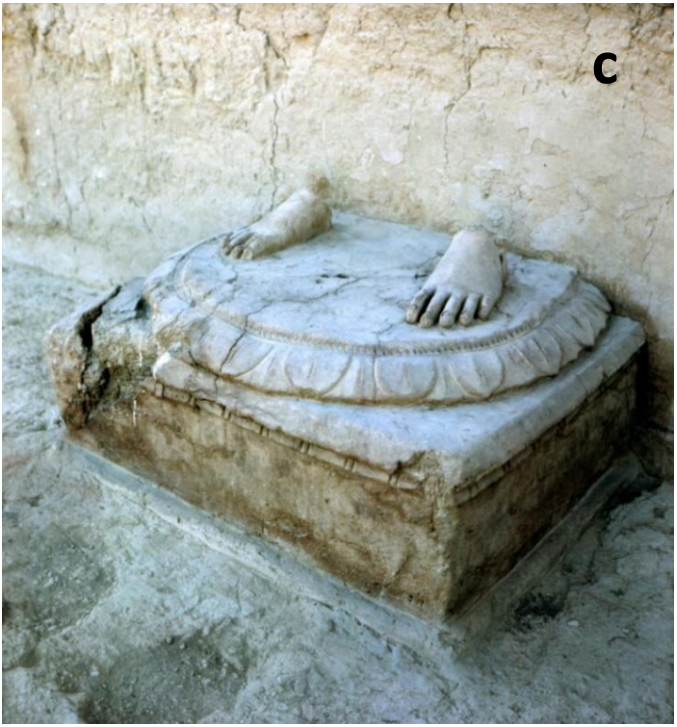
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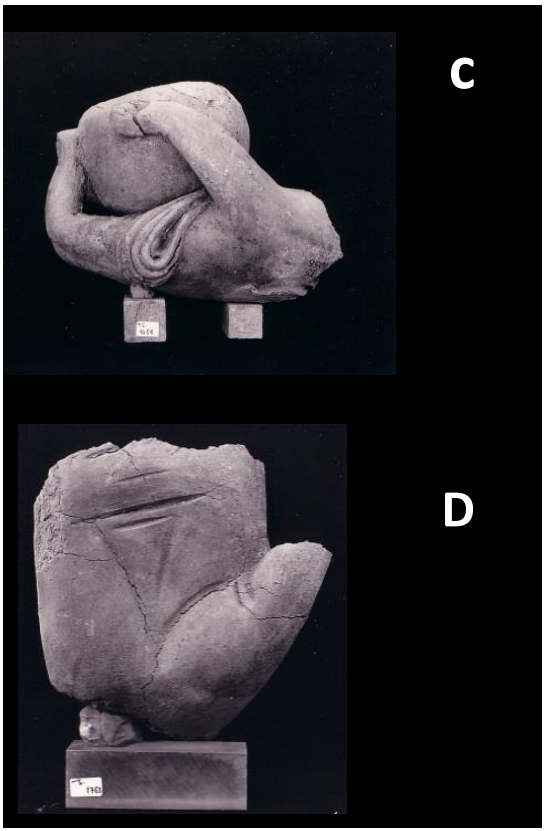


*Plate III: Extant parts of the colossal bejewelled Buddha from Tapa Sardar (not in scale):*
*a) The Buddha's head; b) A fragment of the Buddha's torso with surviving elements of a decorated chasuble; c) The base of the sculpture with remains of the Buddha's feet on lotus; d) A fragment of the Buddha's right hand, in abhayamudra; e) A fragment of the Buddha's left hand holding an alms bowl*

Nevertheless, the accurate excavation records made it possible to hypothetically reconstruct them. While the image of the bejewelled Buddha was reconstructed during the course of the fieldworks, the image of Durga was reconstructed only a few years ago, by a new generation of archaeologists who had not taken part in the excavation.

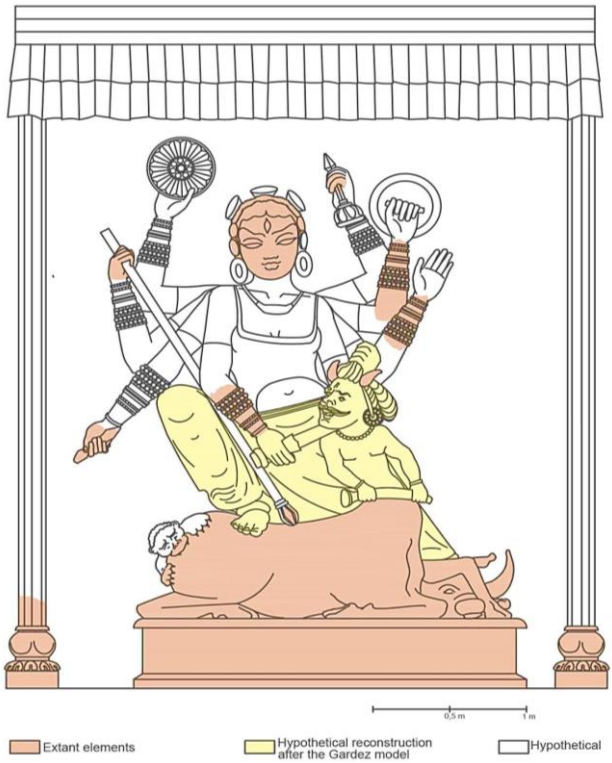


*Plate IV: Hypothetical reconstruction of the colossal Durga Mahishamardini from Tapa Sardar*
*Drawing by Giulia Forgione, based on preliminary sketches by Danilo Rosati and Francesco Martore*


*Plate V: Hypothetical reconstruction of the colossal bejewelled Buddha from Tapa Sardar*
*Drawing by Nicola Labianca (late 1960s), retouched by Giulia Forgione*

Notwithstanding the significant gap in time and the lack of direct experience in the Tapa Sardar fieldworks, we could avail ourselves of the information properly stored and secured by our predecessors.

As for the bejewelled Buddha (or Buddha *paré*, as it is often called in the scientific literature), the surviving elements included the base and feet, the head, the left hand holding the alms-bowl, and fragments of the upper part of the bust showing unmistakable traces of the most distinctive attribute of the bejewelled Buddha, i.e. a richly ornamented three-pointed chasuble.

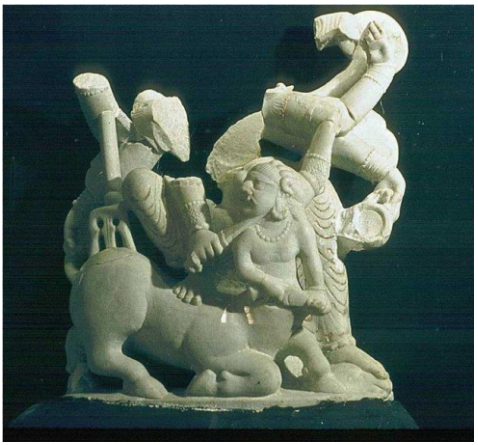

*Fig. 57: Marble Durga from Gardez (max. preserved ht. 60 cm)*

From the surviving elements of the Durga image (a long rectangular base with the lying body and severed head of the buffalo; the head; three hands; three forearms; a fragment of one of the weapons of the goddess; a fragment of a lion muzzle, and a gripping lion paw preserved on the back of the buffalo), it was clear that the goddess, assisted by her animal vehicle (the lion), was portrayed in the moment when, having decapitated the buffalo, she kills Mahisha, who emerges in his human from the neck of the dead animal. Though of non-Buddhist origin, the goddess Durga was evidently integrated (even possibly with a different name) into the Buddhist pantheon, in which she continued her duty of defending the cosmic order against chaos.

This iconographic subject is attested elsewhere in Afghanistan. In particular, the famous marble sculpture of Durga from Gardez has been chosen as a model for our hypothetical reconstruction because of its iconographic, chronological and geographical proximity to the Durga of Tapa Sardar. Details such as the goddess' bodice, head-dress (the presence of the latter suggested

by sockets on the preserved head) and ornaments have been prompted by comparisons with other sculptures from the site. Thus, one may say that, although hypothetical, the reconstruction of the missing parts is firmly based in the material reality and aesthetic principles of the artistic production of the period.

These studies can have significant positive impacts, as they may help identify or confirm the presence of similar models in other contexts. The Durga of Tapa Sardar was the only sure evidence of this goddess being adopted into Buddhist sacred spaces until 2012, when the site of Mes Aynak yielded an extraordinary equivalent in a small four pillared chapel (32N) that had been almost completely destroyed by the fire. The only remains in situ were the lower part of the four wooden pillars, and a rectangular, oblong socle

*Fig. 58: Mes Aynak, Area 32N: a small four pillared chapel preserving an oblong socle, most probably originally meant for a Durga Mahishamardini statue*

(length 2.4 m, width 0.9 m) placed against the wall opposite the entrance.

However, a clay human finger of colossal size and the fragment of a big animal ear (12 cm long), which were found among the debris, witnessed to a lost sculpted composition combining a deity and a beast, a scheme that, to the best of our knowledge, only fits the image of the warrior-goddess Durga. Also, the unusual size and shape of the socle could be perfectly explained if the

figure to be accommodated was the body of a crouching buffalo.

Remember that the goal of the excavation and recovery efforts is not simply to expose and collect artefacts, but to reconstruct the history and behaviours of the past societies, and that identifying and studying iconographic subjects may open unexpected windows into the cultural history of Afghanistan.

The degree of success in achieving this objective largely depends on the quantity and quality of information recorded during excavation. Do not delegate the task of producing information summaries to technologies applied to archaeology, such as aerial photography, GIS analysis and laser scanning. They pertain to a different level of documentation, which integrate and enhance information, but in no way can they replace the daily collection and registration of data.

*Anna Filigenzi*

## Terminologies

| Terms | Terms | Terms |
|---|---|---|
| Rim | Pottery | Spout |
| Slag | Tools | Flat |
| Handle | Lid | Burnt |
| Stamp | Slip paint | Cooking |
| Globular | Animal | Gray |
| Full paint | Hand Paint | Burnished |
| Incision | Ridges | Ropes |
| Free Style | Geometric | Botanical |
| Religious | Glazed | inventory |
| Clay | Glass | Metal |
| Plant Material | Plaster | Sand |
| Stone | Synthetic | Unidentified |
| Antler | Bone | Coral |
| Feather | Fur | Hair |
| Horn | Ivory | Mother of Pearl |
| Pearl | Shell | Silk |

| | | |
|---|---|---|
| Sinew | Stomach | Tooth |
| Vellum | Wool | Backed clay |
| Unbacked clay | Aluminum | Cooper |
| Cooper Aloy | Gold | Iron |
| Lead | Mercury | Silver |
| Steel | Tin | Amber |
| Cotton | Gourd | Grass |
| Linen | Reed | Paper |
| Rubber | Straw | Wood |
| Lime plaster | Mud plaster | Stucco |
| Basalt | Carnelian | Chalk |
| Emerald | Flint | Garnet |
| Granite | Gypsum | Jet |
| Kaolin | Marble | Obsidian |
| Quartz | Rock Crystal | Ruby |
| Sandstone | Schist | Turquoise |
| Acrylic | Nylon | Plastic |
| Polyester | Rubber | Coinage |
| Comparative | stratigraphy | Compass |
| Conch | Contour | Coping-stone |
| Coppersmith | Coprolite | Cordage design |
| Crack | Cordage pattern | Craftsman |

| | | |
|---|---|---|
| Crater | Cremation | Crib |
| Cross section | Custom | Context |
| Cut | Culture | Collapse |
| Cooking Jar | Cave | Coin |
| Column | Corrido | Ceramic |
| Cairn | Courtyard | Chipped stone |
| Dagger | Dark age | Decoration |
| Deity | Deposits | Despoilment |
| Ditch | Dome | Dig |
| Discover | Dislocated | Ecology |
| Everted rim | Ethnography | Etymology |
| Experimental archaeology | | Exploratory excavation |
| Epigraphy | Excavation | Epigraph |
| Entrance | Electron | Field archaeology |
| Field work | Flume | Forge |
| Fort | Fresco | Floor |
| Foreside | Form | Fire Place |
| Fired Brick | Fence | Furnace |
| Flotation | Fill | Gable roof |
| Geometric | Glyptic | Grid system excavation |
| Habitable | Hand mill | Heathenism |
| Hobnail | Hoe | Homo Faber |

Heavy wagon, covered Heritage

Hammer Stone Homo sapiens Iconography

Illegal excavation Illicit Impression

Industrial archaeology Instrument

Interlace Investigation nvestigatorl

Interpretation Iconography Jewel

Jar Kernel hammer Kevel

Knife Kick wheel Ladder

Lapis lazuli Legend Leister

Lithic Layer Landscape archaeology

Limestone Landscape Mace

Mace-head Machete Magazine

Magnifying glass Marble Margarita

Marl Measure Medieval archaeology

Memoir Mill Minaret

Modelling Morphology Mosaic

Mosque Mummify Mythology

Mummy Manuscript Mortar

Mud Brick Masonry Nail

Natural stratigraphy Numismatic Niche

Osteology Oven

Object Oil Lamp Organic

| | | |
|---|---|---|
| Paint | Pediment | Pakhsa |
| Pedology | Peg | Pen knife |
| Perimeter | Pigeon-hole | Poker |
| Period | Phase | Pit |
| Profile | Periodization | Plump-bob |
| Plaster | Pike | Pyramids |
| Physical anthropology | | Plan drawing |
| Profile drawing | Quern | Quiver |
| Rasp | Relief | Rock cut relief |
| Rock shelte | Razor | Recess |
| Renaissance | Retaining wall | Rock-cut tomb |
| Reconstruction | Rope | Sacrifice |
| Salvage archaeology | | Sand |
| Sarcophagus | Sherd | Scrubbing brush |
| Scythe | Shallow | Shroud |
| Skeuomorphic | Skimmer | Sorting |
| Speleology | Splatter | Spud |
| Square molding | Symbol | stratigraphy |
| Site | Square | Structure |
| Survey | Surface | Section |
| Settlement | Sketch | Spout |
| Shell | Storage Jar | Solefaction |

| | | |
|---|---|---|
| Shovel | Scraper | String |
| Saw (Double hand) | Statue | Stupa |
| Stairway | Stool | Sieve |
| Side | Top soil | Trench |
| Temple | Tile | Tower |
| Wall | Wooden object | Archaeology |
| Archaeologist | Anthropology | Abundant |
| Aboriginal | Abrasion | Abacus |
| Arrow | Arrow head | Arch |
| Age | Assemblage | Astrology |
| Aslant | Antiquities | Area |
| Ash | Abattoir | Acculturation |
| Acanthus | Acropolis | Aerial photography |
| Aerial view | Amphora | Accumulation |
| Agate | Alluvial | Altar |
| Analysis | AD | Antefix |
| Archaeobotany | Annular | Antechamber |
| Antelope | Apocryphal | |
| Archaeological investigation | | Archive |
| Argil | Artifact | Artless |
| Assimilate | Aureole | Axe |
| Backside | Baulk | |

| | | |
|---|---|---|
| Bailey | Barrel-roof | Battle-axe |
| Bonfires | Bucket | Burial Jar |
| Base | Basalt | Base course |
| Base line | Bangle | Basin |
| Brick-Bat | Bowl | Burial |
| Bead | Burnish | Bust |
| Backed | Barrow | Bench |
| Calcined bone | Caldron | Cash |
| Calipers | Chronology | Castel |
| Causeway | Cave | Clay |
| Celt | Cultural anthropology | |
| Cemetery | Century | Calibration |
| Capital | Chamber | Chapel |
| Chalcolithic age | Chalice | Grid |

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