



“ शिक्षा मानव को बन्धनों से मुक्त करती है और आज के युग में तो यह लोकतंत्र की भावना का आधार भी है। जन्म तथा अन्य कारणों से उत्पन्न जाति एवं वर्गगत विषमताओं को दूर करते हुए मनुष्य को इन सबसे ऊपर उठाती है।”

- इन्दिरा गांधी



"Education is a liberating force, and in our age it is also a democratising force, cutting across the barriers of caste and class, smoothing out inequalities imposed by birth and other circumstances"

- Indira Gandhi

Block

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BLOCK 4 DATA COLLECTION TECHNIQUES

Introduction

Anthropology, unlike other disciplines, always endeavours to look at the human phenomena holistically and as such its research methods and techniques reflect this spirit and strive to grasp the totality of human phenomena covering a wide range of dimensions that is rarely seen in other disciplines. Anthropological research involves both quantitative and qualitative mix of methods to gain a comprehensive and in-depth view of human phenomena from a close angle in both simple and complex societies. This block provides the basics of a wide spectrum of research techniques that are employed in all major branches of anthropological science right from meanings, definitions to the actual sets involved in the operationalisation of these techniques. Anthropological approach enables one to examine peoples' experiences in detail by employing primary data collection techniques, such as observation, interview, schedule, surveys, case-studies and secondary data collection techniques, such as surveys, census, films, documents, gazetteers etc., in socio-cultural anthropology (which have been covered in **Unit 1** and **2: Primary Data** and **Secondary Data** respectively), several biological techniques to understand not only morphological features but also deeper genetic and molecular level characteristics to know biological origin, variation and adaptation in physical/biological anthropology (covered in **Unit 3: Biological Methods**) and various archaeological techniques to understand the life-ways of the people who lived in the past in archaeological anthropology (covered in **Unit 4: Archaeological Methods**). The systematic and step-wise description and discussion of the techniques will enable the reader to learn and internalise, and subsequently put them to use in the actual field situation.

UNIT 1 PRIMARY DATA

Contents

- 1.1 Introduction
- 1.2 Observation– Direct and Indirect, Participant and Non-participant
- 1.3 Interview– Structured and Unstructured, Key Informants, Interview Guide
- 1.4 Schedule
- 1.5 Questionnaire
- 1.6 Rapid Appraisal Techniques – Focus Group Discussion (FGD)
- 1.7 Case Study
- 1.8 Summary
- References
- Suggested Reading
- Sample Questions

Learning Objectives



After going through this unit, you will be able to:

- know about the different primary methods used in anthropological research;
- learn how to use them according to the need of the study undertaken; and
- understand their relevance in anthropological study.

1.1 INTRODUCTION

Anthropology is a field science and fieldwork is the soul of the subject. In fieldwork, an anthropologist goes to the field and stays with the people whom he wants to study. He observes the phenomena under study and records them systematically. It is true that all phenomena are not visible. In these circumstances, an anthropologist takes help of other techniques of data collection such as interview, case study, schedule, questionnaire, etc. All techniques of data collection have some advantages and disadvantages. Therefore, an anthropologist takes help of more than one technique, when he or she goes to collect data from the field. Establishment of rapport, learning native language, maintaining field note book and use of key informants are also important components of fieldwork.

In this chapter we will discuss the nature, definition, types and process of the different kinds of primary ways through which data can be gathered while conducting fieldwork and examine their significance in anthropological research.

1.2 OBSERVATION – DIRECT AND INDIRECT, PARTICIPANT AND NON-PARTICIPANT

Observation is one of the earliest methods of data collection. It is largely employed by social anthropologists, with sociologists and other social scientists opting in larger numbers for survey and other techniques. Nevertheless, over a period of time observation has gradually gained importance outside anthropology and empirically in the social sciences. Today, observation is considered to be one of the fundamental critical techniques of social research.

Literally, observation means a method of data collection that employs vision as its main means of data collection. It is used as the only technique of data collection, or jointly with other techniques, like in intensive interviewing, and case studies. Observation is one of the major components of Participatory Research Appraisal (PRA). Observation is an indirect method of data collection since in most cases data is collected without the full knowledge of the respondents.

Observation is open to all observable social phenomena. However, there are some limitations. In the first place there are issues that do not lend themselves to an observational analysis, for example personal, sensitive issues or causes and consequences of social phenomena. Also, past or future events cannot be observed. Further, observation is limited by the fact that it is possible with observable phenomena.

There are several types of observation, some more popular than others. Although basically similar, they do differ from each other in the degree of the observer's participation in the environment, or the setting in which it occurs and in the manner in which it is organised.

Participant observation as a technique of anthropological research is associated with Bronislaw Malinowski (1922) which has been incorporated into modern social-cultural anthropological fieldwork as a fundamental element. He not only spent a longer period among the Trobriand Islanders of Melanesia, from 1914 to 1918 but he was also the first anthropologist to conduct fieldwork through native language. Being a participant observer and having knowledge in native language, he was successful in collecting vast information on social, religious, economic and political life of the Trobriand Islanders.

Naive and scientific observation

Naive observation refers to everyday, unstructured observation which people use when they interact with others in social phenomena. Observation becomes scientific when it is systematically planned and executed, when it is related to a certain goal and when it is subjected to tests and controls.

Participant and non-participant observation

In general, the degree of the observer's involvement in observation varies from no participation at all to full participation. In the first case observers study the people from outside the group without becoming a part of the environment of the observed. In the second case, they actually become members of the group they are supposed to study. The first type of observation is known as non-participant observation; the other is participant observation. Malinowski's

classic fieldwork in the Trobriand Islands is of immense significance in the establishment of anthropological fieldwork methods and particularly of the methodology of participant observation.

In participant observation, the observer observes from inside the group. For instance, Verrier Elwin used participant observation in studying the life of the tribal youth among the Muria of Basthar (1947). S. C. Roy who is regarded as 'The Father of Indian Ethnography', conducted fieldwork in tribal villages of Chota Nagpur and Orissa, and published ethnographic accounts on Munda (1912), Oraon (1915), Birhor (1925), Kharia (1937) and Bhuiyas (1935). There are several such studies in anthropological literature on tribal, rural and urban studies in India and abroad. By 'becoming' a member of these groups, one can study among other things their structure, process, problems and attitudes from the inside, and as experienced by the members of the groups.

A method is thought to be qualitative if it shows among other things, at least the following characteristics:

- A commitment to studying everyday life events, which are studied the way they are experienced and understood by the participants.
- A perception of reality as constructed through interaction and communication of the participants.
- Performance of the study in the natural environment of the participants without changing it in any way.
- Perception of reality in an interpretative manner.

Hence, participant observation is set to study social events under all these conditions, bringing data close to reality, the people living in it and the way they construct and experience it.

More particularly, participant observation observes communication and interaction in an unstructured and natural manner, where the design is developed and modified while observation is carried out in a face-to-face relationship, and in an open and flexible way. Here observation is directed towards a social situation, which only later and after the study has been initiated is broken down into single elements.

In the case of non-participant observation, the observers are not a part of the environment they study. Their position is clearly defined and different from that of the people. In ideal terms, the observers are invisible, unnoticed and outside the group they observe.

Between participant and non participant observation, there can be another form of observation. This is called quasi-participant observation. Quasi participant observation is one, where an observer tries to get involved in local daily life (everything from important ceremonies and rituals to ordinary things like meal preparation and consumption) and also carefully observes everything he/she can, about it. Through this the ethnographer or researcher seeks to gain what is called an "emic" perspective or the "native's point of view" without imposing their conceptual frameworks. This emic worldview, which may be quite different from the "etic" or outsider's perspective on local life, is a unique and critical part of anthropology.

Open and hidden observation

This distinction refers to the degree to which the identity of the researcher as an observer as well as the purpose of the study is known to the participants. While in the case of open observation the participants are well informed of the nature of the study and the identity of the researcher but in hidden observation they are not.

Direct and indirect observation

Direct observation studies the subject it intends to explain; for example, if the study intends to explain the patterns of conflict in marital dyads, and observation involves married couples, this is a direct observation. Indirect observation does not involve the observer directly, either because the informant refuses to take part in the study or a direct observation is not possible (e.g. the subject is deceased). Instead, researchers observe the physical traces of the phenomena under study, which have been left behind and make conclusions about the subject.

The researcher has to carry a field diary and write the observations while collecting data by using observation as a research tool. The application of different types of observation depends on the nature of the event to be observed, the acceptance of people participating in that event and the skills of the observer.

The structure and process of observation depend on many factors, especially with regard to the underlying methodology. While in some cases observation is employed as participant observation, in other cases it might appear as non-participant observation. In case study research, for instance, both direct observation and participant observation can be employed, however, in both cases its process is quite clearly explained and outlined in the protocol.

In some cases (where the detailed step by step program of the event to be observed is known in advance, example: marriage ritual) observation is employed in a structured way, where everything must be followed to the last detail as prescribed; in other cases like dispute resolution, it is done only while employing other methods, for example while interviewing respondents.

The skills of the observer is often more significant in the context of observation than that of assistants working in the context of other forms of data collection; this is because observation, particularly participant observation relies very much on the attributes of the researcher for both amount and quality of information. Skills are more in demand here than in experiments or surveys. Particularly with regard to observation employed in the context of case studies, this is more crucial since the observer is often expected to carry out the study single handed.

The qualities of an observer will vary from case to case particularly with reference to the type of observation chosen. But intelligence and previous experience with observation, exact knowledge of the topic and (where appropriate) of the categories, flexibility and adaptability, ability to get along with others, to follow instructions to the smallest detail, to be unbiased and free from ideological constraints and to be honest and trustworthy are of paramount importance.

Pilot studies will certainly show the way. Nevertheless, concentration on the following points is a must for researchers:

- Thorough understanding of the research topic;
- Knowledge of the peculiarities of the population;
- Understanding of possible problem areas of the study;
- Familiarity with the categories (where appropriate) and their effective use;
- Introduction to ways of overcoming unexpected problems and conflicts;
- Ability to follow instructions accurately and adjust them without causing bias or distortion of the data;
- Adaptability and flexibility;
- Ability to observe several subjects and categories at the same time.

The nature of observation makes ethics a real issue since observers have the opportunity to interfere directly with the personal life of the subjects, and since in many cases observation takes place without the subjects being aware of it. This becomes even more serious when the subjects do not know the identity of the observer. However, in some cases ethics is not an important issue and should not hinder researchers from pursuing their research interests if they think that the investigation is carried out for a good purpose.

We will find that observation as a method of data collection is generally considered to have the following advantages over other methods.

- It provides information when other methods are not effective.
- It employs a relatively less complicated and less time consuming procedure of subject selection.
- It can offer data when respondents are unable and/or unwilling to cooperate or to offer information.
- It approaches reality to its natural structure and studies events as they evolve.
- It offers first hand information without relying on the reports of others.
- It allows the collection of wide range of information even when the information is thought to be, at the time of study, irrelevant. This is particularly true of participant observation.
- It is relatively inexpensive.

However observation also has some limitations, of which the ones listed below are the most significant.

- It cannot be employed when large groups or extensive events are studied.
- It cannot provide information about past, future or unpredictable events.
- It is inadequate when studying certain phenomena such as sexual behaviour, family violence, etc.
- It is exposed to the observer's bias, selective perception and selective memory.
- It offers no control measures regarding bias, attitudes and opinions of the observer.

- It cannot offer quantitative generalisations on the results.

Despite these limitations, observation one of the most popular methods of data collection, employed by researchers of both the quantitative and qualitative domains.

Activity

- Choose an event/occasion/ritual/everyday affair to observe. Write what you observed in detail and tell us what kind of observation method did you use and why?

or
- Is there any form of observation between participant and non-participant observation? If yes, name it and tell us when it is used.

1.3 INTERVIEW – STRUCTURED AND UNSTRUCTURED, KEY INFORMANTS, INTERVIEW GUIDE

Interviewing is a form of questioning characterised by the fact that it employs verbal questioning as its principal technique of data collection. Interviews are a common occurrence in everyday life, but as a tool of social research, or better as a method of data collection, interviewing is different. This is so with regard to its preparation, construction and execution, first because it is prepared and executed in a systematic way, second because it is controlled by the researcher to avoid bias and distortion and third due to the fact that it is related to a specific research question and a specific purpose.

Interviews are employed as methods of data collection in most research designs, regardless of the underlying methodology. Qualitative studies employ unstructured forms of interviewing, such as intensive interviewing and focused interviewing, while quantitative studies employ predominantly structured interviews. Semi-structured interviews are employed in both qualitative and quantitative studies.

There are many types of interviews, each of which differs from the others in structure, purpose, role of the interviewer, number of respondents involved in each interview, and form and frequency of administration.

Structured interviews

They are based on a strict procedure and a highly structured interview guide, in which case it is no different from a questionnaire. The instrument allows no freedom to make adjustments to any of its elements, such as content, wording or order of the questions.

Such interview is based on a schedule, and strict adherence to the questions and the instructions is paramount. The interviewer is expected to act in a neutral manner, keeping the same tone of voice, offering the same impression to the respondents, using the same style, appearance, prompts, probes etc., and showing no initiative, spontaneity or personal interest in the research topic. The purpose of this is to reduce interviewer bias to a minimum and achieve the highest degree of uniformity in procedure.

Unstructured interviews

They have no strict procedures to follow as described above. There are no restrictions in the wording of the questions, the order of questions or the interview schedule. The interviewer acts freely in this context, on the basis of certain research points, formulating questions as and when required and employing neutral probing. The structure of these interviews is flexible and the restrictions minimal, being presented in most cases in the form of guides rather than rules.

Semi-structured interviews

They lay somewhere between structured and unstructured interviews. They contain elements of both, and while some are closer to structured interviews, others are closer to unstructured interviews. The degree to which interviews are structured depends on the research topic and purpose, resources, methodological standards and preferences and the type of information sought, which can be either quantitative or qualitative techniques.

The researchers i.e. the interviewers hold a central place in the research process. They have to follow the following tasks:

- Selecting and/or approaching the respondents
- Arranging the time, date, duration and conditions of interview.
- Performing the interview by following the instructions.
- Controlling the interview situation towards reducing or eliminating resistance, suspicion, prejudice and negative forces.
- Avoiding bias and working towards an objective.
- Recording the answers accurately.
- Establishing and monitoring positive relations.

Due to the significance of the interviewer in the research, investigators employ a very systematic process when selecting the interviewer. The criteria usually considered as significant are:

- Honesty, trustworthiness and self control.
- Intelligence, maturity and friendliness.
- Sociability and social acceptability.
- Carefulness, consciousness and ability to concentrate.
- Accuracy and dependability.
- Objectivity and lack of prejudice.
- Adaptability, independence and initiative.
- Verbal ability and ability to listen to others carefully.
- Interest in and familiarity with the research topic.
- Ability to work with others in a team of experts.

After selection, interviewers usually undergo training which depend on interviewers' skills, experience and nature of the topic. The training generally includes the following features:

- Developing and practicing interviewing skills, mainly through observation, practice and criticism.
- Learning how to present oneself to the respondents, appropriate manners about the lifestyle of the subjects and about presentation and appearance.
- Learning essential techniques of persuasion necessary to convince uncooperative respondents for participation.
- Acquiring knowledge and skills related to obtaining relevant information and recording it accurately.
- Establishing standards of value neutrality, ethics, anonymity and confidentiality.

The following common steps can be identified in all forms of interviewing:

Seeking the respondents

When meeting the prospective respondents the interviewer must introduce himself/herself, explain the intention of the visit and purpose of the research, disclose the sponsor, ensure anonymity and confidentiality, explain details of research and arrange a place, date and time for the interview.

Asking and recording the questions

The interview guidelines should be observed accurately. Asking questions depends of course on the type of interviewing. Recording should take place as given in the instructions. Some respondents may interpret taking notes as a breach of promise, or get confused. In other cases, taking notes is perceived positively, since some people think that the interviewer who records notes takes their views very seriously. Some ways to overcome such difficulties include writing down key words only, and completing the notes at the end of the interview. The most successful way is the use of tape recorders with the permission of the subjects.

Field supervision and checks

Data collection is the most significant part of the research, and its administration should not be left entirely up to the interviewer. Supervision and checks are important in helping to avoid incomplete answers and interviews, refusals to answer certain questions or even to take part in the interview, too much or too little probing and inadequate recording of the data. Checks for bias, honesty, politeness, objectivity, ethics and interviewer-respondent relationships should also be made.

Completion of the interview

The friendly relationship between the interviewer and the respondent should end with some care, smoothly and in a friendly atmosphere after the questions have been answered and after completion checks have been made.

Interviewing is the most commonly used instrument for data collection in social research. We can note the advantages below:

- Flexibility– adjusted to meet many diverse situations.
- High response rate– attracts a relatively high response rate.
- Easy administration– no need to read and handle complex documents.
- Opportunity to observe non-verbal behaviour.
- Less patience and motivation to complete are needed than are required.
- Control over the environment– control the conditions under which the questions are answered.
- Capacity for correcting misunderstandings by respondents.
- Control over the order of the questions.
- Opportunity to record spontaneous answers.
- Control over the identity of the respondent.
- Completeness of the interview guaranteed.
- Control over the time, date and place of the interview.
- More complex questions can be used to elicit information.
- Greater permissible length is more possible in interviewing than other methods.

Despite its advantages, we see that interviewing is limited by a number of factors. They may be:

- Interviews are costlier and time consuming than other methods.
- Interviews are affected by the factor 'interviewer' and the possible bias associated with it.
- Interviewing is more inconvenient than other methods.
- It offers less anonymity than other methods.
- It is less effective than other methods when sensitive issues are discussed.

Apart from these limitations, interviewing is affected by factors common to other techniques of data collection, for example deliberate misrepresentation of facts, genuine mistakes, unwillingness or inability to other information and similar problems. In such cases, however, it is easier to detect problems when interviewing than when using other methods.

They are capable of providing past and present information in detailed form. They have good memory and gives information even analytically. The method of sampling does not arise in selection of key informants. They can be selected purposively based on the nature of data to be collected.

Interview guide

Interview schedule and interview guide are almost similar and they act as the guide points in interview. It guides the researcher in conducting interview and avoids deviations from the data to be collected.

1.4 SCHEDULE

Schedules and questionnaires are beneficial as supplementary devices in observation, in interviews, and in evaluating personal behaviour and social situations. They also aid in standardising and objectifying observations and interviews, and finally they are useful devices for isolating one element at a time and thus intensifying observation of it.

There is a vast variety of schedules and they can be classified in various ways.

Observation schedule/guide

The observation schedule offers the opportunity for uniform classification in recording the activities and social situations of persons or groups being observed.

One observer or several may be employed to secure uniformly systematic data in an observation study.

An observation schedule usually serves several purposes simultaneously:

- It is a specific “memory tickler”
- It is an objective recording of data.
- It is a standardising device.
- It aids to delimit the scope of the study.
- It aims to concentrate on the circumscribed elements essential to the analysis.

Document schedules

These are used for recording data obtained from documents, case histories, and other materials. The document schedule should not be considered a tally sheet. A separate schedule should be used to list the pertinent points from each case record.

Institutional survey or evaluation schedules

These are used to visualise the problems faced by or inherent in a given type of institution. The length of such schedules depends upon the aspects of the given situation under investigation.

Interview schedule

These are used in collection of data through interviews. They help the investigator in maintaining objectivity in collection of data and avoid deviations during interview. They are used in most of the social science research studies as the investigator gets the benefits of observation, interview and schedule.

Structure and preparation

The structure and preparation of schedule and questionnaire are almost same. Both contain close and open ended questions. However, the schedule contains questions and blank tables unlike the questionnaire that mostly contains questions only. Both the tools need pre-testing for standardisation.

1.5 QUESTIONNAIRE

Surveys are also a known method of data collection in anthropology. The information is gathered through oral or written questioning. Oral questioning is known as interviewing, written questioning is accomplished through questionnaires. The central elements of questionnaires consist of their nature, structure, content, design and construction, their strengths and weaknesses and the forms in which they are employed. The main characteristic of this method is that data are offered by the respondents, with limited interference on the part of research personnel. The issues such as questionnaire format, type of questions, content of questions and the response format are as relevant to interviewing as they are to questionnaires.

The advantages which most researchers and writers consider as significant are listed below:

- Questionnaires are less expensive than other methods.
- They produce quick results.
- Questionnaires can be completed at the respondent's convenience.
- They offer greater assurance of anonymity.
- They offer less opportunity for bias or errors caused by the presence or attitudes of the interviewer.
- Questionnaires are a stable, consistent and uniform measure, without variation.
- They offer a considered and objective view on the issue, since respondents can consult their files and since many subjects prefer to write rather than talk about certain issues.
- The use of questionnaires promises a wider coverage, since researchers can approach respondents more easily than other methods.
- They are not affected by problems of 'no-contacts'.

The limitations that we find here are:

- They do not allow probing, prompting and clarification of questions.
- They do not offer opportunities for motivating the respondent to participate in the survey or to answer the questions.
- The identity of the respondent and the conditions under which the questionnaire are answered are not known. Researchers are not sure whether the right person has answered the questions.
- It is not possible to check whether the question order was followed.
- Questionnaires do not provide an opportunity to collect additional information while they are being completed.
- Due to lack of supervision, partial response is quite possible.

Regardless of whether the questionnaire is administered personally or by mail, it has to be constructed according to certain standards and principles. In the

first place, it has to include three main elements, each having a certain purpose: the cover letter, the instructions and the main body.

The main aims of the cover letter are to introduce the respondents to the research topic and research team, to neutralise any doubt or mistrust respondents might have about the study, to motivate them to participate in the study and answer the questions, and to assure them of anonymity and confidentiality. The following are the minimum number of points to be included in the cover letter. The cover letter has been recognised as one of the factors that influence the response rate.

- The main objectives and social significance of the study;
- The reasons why the respondent should answer the questionnaire;
- Assurance of anonymity and confidentiality;
- Requirements for completion such as maximum time, conditions etc.,
- Issues related to ethics.

Instructions regarding how to state their answer or preference, will be given on the questionnaire or on a separate sheet. The instructions usually remind the respondents that they should not try to please the researcher, that there are no right or wrong answers and that all questions should be attempted, and instructs them about what to do with the completed questionnaire, for example that it should be returned to the project director in the self addressed and stamped envelope by a certain date. Inadequate instructions are one of the major sources of non-responses and should be avoided.

The main body of the questionnaire includes the questions that are to be answered. In order to be effective it must be worked out carefully with regard to content, structure, wording, flow, format and so on.

Questionnaire construction is a very demanding task which requires not only methodological competence but also extensive experience with research in general and questioning techniques in particular. The questions should be clear, easy to read and attractive to the respondent. The questions have to be listed in a logical order, allowing for transition and flow, and avoiding distortions and problems. The questionnaire format is chosen to suit the nature of the survey, the type of respondents, length of questionnaire, nature of administering the questionnaire, and the findings of a pilot study.

The size of the questionnaire depends on factors such as the research objective, the type of respondents, the methods of analysis and availability of resources. One should include as many questions as necessary and as few as possible.

Questions contained in a questionnaire vary with respect to a number of criteria, especially those relating to their relevance to the research topic, their approach and structure, content and wording, and with regard to the type of response they require. The questions can be classified as: i) primary questions, ii) secondary questions, iii) tertiary questions, iv) padding questions, v) probing questions, vi) direct and indirect questions, vii) suggestive questions, viii) filter and contingency questions and ix) fixed alternative and open-ended questions. Open-ended questions have many advantages and several limitations. Pre-coded

questions have the advantage of being easy to administer, to code and to answer. They also have several limitations, particularly restricting the freedom of the respondents.

The content of the questions is obviously the most important element of the construction of a questionnaire. The researcher has to consider the following points while preparing a questionnaire.

- Every question must be relevant to one or more aspects of the study.
- Ambiguous, non-specific and hypothetical questions are to be avoided.
- Leading, double barreled and presuming questions should not be employed.
- Embarrassing, personal or threatening questions should be avoided.
- Vague words and academic jargon should not be used.
- The language of the respondent should be employed.
- Easy flow and logical progression in the questionnaire should be assured.
- Each question should ask what it is supposed to ask.

The success of the questionnaire in general and the response rate in particular depend to a large extent on the following factors:

- The questionnaire must have a professional appearance and should give the impression of a document that deserves respect and invokes feelings of responsibility.
- The questionnaire should be presented in a way that encourages the respondent to complete and return it.
- Print and colour of paper and ink must correspond with the preferences of the respondents.
- The questionnaire should be presented as a complete document with an inviting and reassuring introductory cover letter and a concluding note containing instructions regarding the return of the questionnaire.
- Sufficient instructions and probes should be provided where necessary.
- Pre-coded questions should offer adequate response categories.
- All questions should be checked for possible bias and ethical adequacy.

Questionnaires are constructed in a very sophisticated and systematic manner. The process of construction goes through a number of interrelated steps such as: i) preparation, ii) constructing the first draft, iii) self-critique regarding relevance, symmetry, clarity, simplicity and other things, iv) external scrutiny, v) re-examination and revision, vi) pre-test or pilot study, vii) revision, viii) second pre-test and ix) formulation of the final draft.

Questionnaire construction is not only employed in the area of mail questionnaires, it is also employed by researchers using interviews. Here the communication between the researcher and the respondents is closer and more intense than it is in mail questionnaire.

Activity

How do you think an interview schedule is different from a questionnaire? Tell us about these differences and what according to you is the better among the two, in terms of collecting data?

1.6 RAPID APPRAISAL TECHNIQUES– FOCUS GROUP DISCUSSION (FGD)

This method was introduced by Kurt Lewin in 1936 in the USA, in the context of small group experiments, and later in other areas of research, including market research and opinion research in the USA and other countries. The respondents are brought together in an 'artificial' environment created for the purpose, and are examined according to some methodological criteria. Focus groups can be subjected to 'treatment' in a controlled way, converting them to a kind of quasi-experimental method. Consequently, knowledge of experiments, their nature, strengths and weaknesses can help us to use focus groups more constructively.

Focus groups are employed extensively among many social researchers, with the range of social scientists using focus groups steadily increasing. They are used as a preliminary study leading to quantitative research, as a self-contained and principal method of research, as a supplementary source, or as a part of a multi-method study. In any case, focus groups involve persons specially selected owing to their particular interest, expertise or position in the community in an attempt to collect information on a number of issues, as well as to brainstorm a variety of solutions, and ultimately facilitate group discussion as a tool of data collection and possibly policy construction.

Focus groups are used as a form of (quantitative and qualitative) data collection that employs discussion in a non-standardised form and observation as its sources. It is primarily a way of gaining information in a short period of time about the breadth or variation of opinions, and of establishing a mechanism of opinion formation.

The basic assumption that underlies this method is that a group environment will, through mutual stimulation, encourage discussion related to topical issues, increase the motivation to address social issues; enable the discussion leader to lead the discussion towards focal points and topical issues through encouragement or discouragement or manipulation of the environment; and allow significant points of view to be presented in a real, emotional and summated form as spontaneous expressions (in other words, reducing the opportunity for a controlled presentation of personal views).

This is expected to occur when (1) addressing, describing or explaining an issue introduced by the leader or a member of the group; (2) comparing different points of view, evaluating views and discussion outcomes, and judging relevant arguments; or (3) making discussion or drawing conclusions presenting alternative points of view, trying to achieve or suggesting a possible consensus.

The FGDs can serve several purposes and the following are thought by many researchers to be the most significant:

- As a pre-research method it can help to prepare the main study by providing sufficient information about the study object, about operationalisation by defining indicators and about preventing possible errors.
- As a post research method it can explain trends and variances, reasons and causes, through the views of the respondents.
- As a main study it offers information about group processes, spontaneous feelings, reasons and explanations of attitudes and behaviour as adequately as any other method.
- In one form it can bring about changes in the group and its members as a result of the direction and intensity of the discussion.
- In another form, group discussion allows access to valuable information about group processes, attitude changes and manipulation, attitudes and opinions of group members, the group or the public, the effectiveness of certain methods and so on.

There are four major steps in it: being strange, orientation, adjustment, intimacy, conformity and fading out of the discussion.

Choice of respondents

Choice of respondents is accomplished through a random procedure, systematic or cluster sampling, or other ways that can be justified by the object of the study, nature of the respondents or the underlying methodology. Question of interest here may be related to the structure of the group, that is, whether it should consist of similar or different people, age and gender of the respondents and so on.

The size of the group must be large enough to provide a basis for a reasonable discussion but not too large to become uncontrollable. The group size should be between 5 and 12 but no larger than 20. A size around 10 seems to be ideal.

The group composition depends on methodological factors. The members of the group must be talkative, knowledgeable of and interested in the research topic.

Introduction of goal-directed discussion

After a group is selected for investigation, a goal-directed discussion is introduced by the group leader. This is accomplished through the introduction of a 'discussion generating question' supplied by the researcher. The group leader will intervene as required, directing the discussion to the research goals and keeping its course interesting and balanced. The way in which discussion will be introduced, organised and controlled is summarized in an interview guide which is given to group leaders.

Discussions are led on the basis of instructions. In physical terms, the environment in which the discussion will take place should be conducive to encouraging debate. Rooms must be arranged so that all respondents can see each other and communicate with all participants freely.

Controlling the discussion

The discussion will be controlled by the leader as required by the situation. Discussions that are slow to start will be helped to gain momentum through

additional questions, probes and other appropriate means; non-talkers will be encouraged to participate and those who dominate the discussion will be controlled. Motivation, encouragement, stimulation and control will bring about a balanced environment that is conducive to group discussion.

Recording the data

The type of information to be collected depends on the research question and purpose of the study. If the data is collected in a qualitative context, interpretation in a reductive or explicative form will be most appropriate. In other cases, hermeneutic method might be chosen.

A leader – often referred to as the facilitator – occupies a central position in the context of group discussion. The quality of data collection using FGD depends on the skills of the facilitator. Consequently, leaders are expected to have the following qualities:

- Theoretical and methodological knowledge of the research topic and general intellectual capacity.
- Experience with group work as well as the ability to control the discussion effectively by encouraging involvement, controlling dominating participants and keeping the discussion moving in the right direction.
- Leadership qualities.
- The ability to develop a warm atmosphere among the members of the group.

There are many ways of recording data produced in group discussions. Electronic recording is common, but demonstrates several shortcomings, for example it can cause some distortions (members might feel intimidated or not wish to talk when their statements are recorded), especially when used at the beginning of the discussion, since it might distract the respondents and lead to selective participation in the discussion. Electronically recorded data also require additional time for analysis and evaluation and this is a very time consuming exercise.

Writing down the discussion manually is the good old way of recording such data, but this is still not without problems. Perhaps having two leaders, with both of them taking notes in turn or one recording the data and the other leading the discussion, may be the ideal solution. Another issue is the content of the recording.

Group environments do encourage people to express views and to evaluate situations, especially when 'encouraged' or 'manipulated' by the leaders. Nevertheless, this advantage may cause several problems, such as those listed below:

- Group conditions might force people to hide their real opinions, especially as their views can have effects on their personal life or professional career.
- There are problems with recording the data.
- Domination of the discussion by some persons might affect the direction and outcome of the discussion.
- Some members may not participate in the discussion.

- A trend of the group to please the leader might occur, for many reasons.
- Success of the method relies very much on the qualities of the leader and the composition of the group.
- There may be difficulties with keeping the discussion on track.
- The findings may not be representative.
- It is used as a form of exploration rather than as an independent and autonomous study.

1.7 CASE STUDY

Case study research involves studying individual cases, often in their natural environment, and for a long period of time. It employs a number of methods of data collection and analysis. Case study analysis is a type of research that is different from other forms of investigation and demonstrates the following distinguishing characteristics:

- It studies whole units in their totality and not aspects or variables of the units.
- It employs several methods primarily to avoid or prevent errors and distortions.
- It often studies a single unit: one unit is one study.
- It perceives the respondent as an expert not just as a source of data.
- It studies a typical case.

Today, case studies are considered to be valid forms of inquiry in the context of descriptive as well as evaluative and causal studies, particularly when the research context is too complex for survey studies or experimental strategies, and when the researcher is interested in the structure, process and outcomes of a single unit.

Case studies in quantitative and qualitative research

Case studies are employed indiscriminately in both quantitative and qualitative research, although to a different extent and for different reasons. Case-studies are also employed for the purpose of exploration, and for the following reasons:

- To gain more information about the structure, process and complexity of the research object when relevant information is not available or sufficient;
- To facilitate conceptualisation;
- To assist in formulating hypothesis;
- To guide the process of operationalisation of the variables;
- To illustrate, explain and offer more detailed quantitative findings;
- To test the feasibility of the quantitative study.

In all cases it is obvious that case studies are not used as an autonomous research project but as a supplement to other studies.

The case-study protocol

The protocol contains the main steps of the research process, offering details about the decisions that need to be made and the techniques that must be employed in the context of the study.

- i) An overview of the case-study project is to know what it is all about, the case(s) to be investigated, special characteristics of the research unit(s), the aim of the study, expected outcomes and so on.
- ii) The field procedures involved in case study method are choosing the case(s) to be studied, the ways of gaining access to the research unit(s) including key organisations and informers, the resources required in the field for the completion of the study, communication patterns while in the field, an outline of data collection activities to be considered at the various stages of the study, and in general planning for unexpected events that might crop up during the study.
- iii) There are case-study questions which mainly act as reminders of the issues that need to be addressed in the study.
- iv) A guide for preparing the report which tells us about the elements it must contain, its style, format and the audience it might address.

1.8 SUMMARY

Thus this unit can be seen as highly informative as it discusses the following concerns. Anthropological data can be collected through fieldwork, using observation, interview, questionnaire, schedule, case study and other tools and techniques. The selection of tools and techniques depends on the objectives of the study, the population to be studied, advantages and disadvantages of the available research tools, time and financial budget of the study. Observation gives more valid data but it is costly, time consuming and not possible in all social situations. Mailed questionnaire can be covered more extensively but response and the quality of data depends on several factors. Interview is more advantageous than questionnaire and schedule, as interview can be flexible in getting data. Nevertheless interview is also costly and time consuming when compared to the use of questionnaire and schedule.

Case study is an intensive study of a particular unit and the unit may be an individual or a group or a social phenomena. It provides only qualitative data. Case study data strengthens the quantitative data. It is also a costly and time consuming method. Rapid Appraisal techniques are a combination of different tools and techniques and they save time, man power and finances. FGD is a costly and time consuming method. But it provides more valid data and it is more appropriate in development and market research.

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Sample Questions

- 1) What is participant observation? How it is useful in anthropological research?

Data Collection Techniques

- 2) Describe the advantages and disadvantages of observation.
- 3) What is interview? State the differences between structured and unstructured interviews.
- 4) Discuss the similarities and differences between interview and questionnaire.
- 5) State the advantages and disadvantages of interview and questionnaire.
- 6) What are the precautions to be taken in the application of mailed questionnaire.
- 7) What is interview schedule? State the advantages and disadvantages of interview schedule.
- 8) What is case study? How it is useful in anthropological research?
- 9) Discuss the use of Rapid Appraisal techniques in anthropological techniques.



UNIT 2 SECONDARY DATA

Contents

- 2.1 Introduction
- 2.2 Census
- 2.3 Registration System and Population Registers
- 2.4 Sample Survey – National Sample Survey
- 2.5 Handbooks
- 2.6 Gazetteer
- 2.7 Films
- 2.8 Manuscript
- 2.9 Documents
- 2.10 Administrative Records
- 2.11 Other Sources of Data
- 2.12 Summary
- References
- Suggested Reading
- Sample Questions

Learning Objectives



After studying this topic, the student should understand:

- the importance of collection of reliable quantitative as well as qualitative empirical data;
- various techniques of secondary data collection;
- the sources of valuable demographic data collected through census, registration method, sample surveys, administrative records, handbooks, gazetteers, etc.; and
- that historical reconstruction is often made on the availability of historical records, films, manuscripts and earlier documents.

2.1 INTRODUCTION

The most important problem that social scientists including anthropologists of the day face, concerns the collection of relevant reliable data. The scholars belonging to various social sciences have developed their own techniques of data collection, depending upon the nature of their discipline. Data on births and deaths are normally obtained from vital (or civil) registration system. In countries where registration of marriage is compulsory, data on marriages and divorces, etc. are again obtained from the civil registration system. However, the registration of territorial movement largely relates to international migrants only. There are very few countries in the world from which data on internal

movement becomes available from their population registers. These data are otherwise obtained by including some specific questions in the population censuses or by conducting special sample survey queries. Data on social mobility are partly obtained in population censuses and partly by conducting special sample surveys. In India, as in many other countries, a large mass of demographic data are collected regularly through nationally sponsored surveys. Certain demographic characteristics of the individuals and/or heads of the households are also collected from time to time as part of the routine administrative work in various government and quasi-government organisations, for example, at the time of school admission, for the purpose of procuring ration cards, for obtaining medical services, for voting at elections, etc. All these become administrative sources of population statistics. In this unit we will learn about different forms of secondary data collection techniques which are categorically important in anthropology and its research.

2.2 CENSUS

A census count offers a spectrum of population at a particular point in time covering a wide range of demographic, social and economic attributes of population. Fortunately, census once taken tends to become a continuous process repeated every ten or five years. Population censuses are generally conducted on decennial basis and are the most important sources of demographic information. In India, although estimates of population census were obtained during the time of Chandragupta Maurya and Akbar, but the first population census with a modern concept covering almost the whole of India was carried out in 1872. The next censuses which were conducted in our country were after every ten years. The census of 2001 is the 14th census and though collection of 2011 census has been completed, the analysis of the data is awaited.

In India the first systematic census in 1865-72 was an attempt to collect demographic data. The second census was conducted in 1881 and since then decennial census has become a regular feature.

The Indian census till 1931 was *de-facto* or a synchronous census. Census enumeration was undertaken throughout the country on a particular night in order to count the people at the place where they are found except for snow bound and inaccessible areas where census was done at a later stage. This practice of simultaneous enumeration of the whole population on a fixed date was given up after 1931 census due to inherent difficulties and the concept of *de-jure* (counting people at place of residence) was adopted. Under this scheme the enumeration is spread over a period of roughly 3 weeks but the count is brought to a fixed date by making a revisional round to make any changes in the entries which may arise due to occurrence of births or deaths between the date of visit to the household and the date of reference.

The evolution of modern census was gradual. In many areas particularly the Far East, a tradition of household canvasses of population registrations continued for quite some time before public confidence, administrative experience and technology could combine to produce counts which could match the standards of completeness, accuracy and simultaneity of modern census. The censuses of pre-19th century which began with the objectives of determining military, tax, and labour obligations had to change their scope in the 19 century to meet other administrative needs of the modern society. The new items relating

to the needs of business, labour, education, research now included on the census questionnaires reflected new problems confronting the state and society. In India the date of census is carefully chosen as to fall at the time when most parts of the country are easily accessible and people are not too busy with their economic pursuits and are relatively free from festivals also so that they would be available at the places of their normal residence and comparatively free from movement and will find time enough to answer. Except the first census which was taken in November all other have been taken in February and March.

Census gives a complete account of a population in its social and economic setting and presents a picture of a population at a fixed point of time. This certainly helps the researcher who ventures to study any group, community, village etc and learn about the demographics of the population.

2.3 REGISTRATION SYSTEM AND POPULATION REGISTERS

The practice of population registration has been quite common even before the emergence of regular censuses. The Far East has a great demographic tradition of population registration. This practice was common in ancient China, its major function being the control of population. The family constituted the basic social unit in this system of record keeping. Theoretically, such a record keeping should have yielded a continuous population register but in practice the compilations were either not made or landed in inaccessible archives. The Chinese system of registration gradually diffused to nearby lands also. Japan also adopted Chinese system and developed Koseki or household registers. There are evidences to show that there existed such household registers for over a thousand years. It may be worth mentioning here that Japan's first census or a complete canvass of households was not attempted until 1920. Similarly, Korea is also reported to have frequent compilations of populations and households at least since 1395. In modern times, registration systems have been adopted by different countries to record births, deaths, marriages, divorces, adoptions, employment, etc. Some countries call them as population registers. These registers are some times completed at a single point in time, sometimes are repeated periodically and sometimes are cumulative. The cumulative registers are brought up-to-date by recording these occurrences. The chronology of important events in the development of civil registration and of the vital statistics derived from it has been brought out very usefully in the United Nations (1955) *Handbook of Vital Statistics Methods*. According to this handbook, vital statistics registration system can include legal registration, statistical recording and reporting of occurrences and the collection, compilation, analysis, presentation, and distribution of statistics pertaining to vital events like deaths, still-births, marriages, divorces, adoptions and legal separations. The demographers, of course, are concerned with the vital statistics and less with the legal issues of the documents. In most of the countries, it is obligatory on the part of the individuals to get each birth and death registered with the concerned registration office otherwise it can invite legal action. Since, such registrations are continuous, compulsory and legal, therefore the data supplied by these registers are quite satisfactory. However, the quantum and quality of data being collected by the registration authority vary from country to country. It has been estimated that reliable records of deaths and births are available for

about half the world's population while marriage and divorce statistics may cover only one third of the world's population. In India, the registration of births and deaths is the obligation of the head of the family. The population register is maintained by the municipalities in urban areas and by local revenue official in the rural areas. The registration in India has improved significantly after independence, making the data pertaining to deaths and births in India almost complete and fairly reliable. Such registers are of help to a researcher conducting anthropological investigation.

2.4 SAMPLE SURVEY – NATIONAL SAMPLE SURVEY

Besides the population census many countries in the world have been collecting population data through nationally organised sample surveys. A complete national canvass of the population would be always recognised as a census. On the other hand, a canvass of selected households in a village or urban centre with a view to collecting information on demographic attributes, socio-economic conditions, etc. may be regarded as surveys. But neither the use of sampling nor the geographical size of the area provides a universally recognised criterion for demarcating the boundaries between a census and a survey.

In India National Sample Survey (NSS) was started in 1950. The National Sample Survey (NSS) is a nation-wide, large-scale, survey operation which is done on a regular basis and is operated in sequential turns. NSS was introduced to fill up data gaps for socio-economic planning and policy making by means of sample surveys.

In March 1970, the NSS was restructured and all its work facets were clubbed and were introduced as one Government organisation. From then on it came to be known as National Sample Survey Organisation (NSSO). It was from then on taken over by the Governing Council to impart neutrality and sovereignty in collecting, processing and publishing of NSS data.

It has been providing valuable demographic data at national and state levels on items such as population, births, deaths, internal migration, employment and unemployment, morbidity, etc. along with many other types of socio-cultural information. Such data is highly helpful to the anthropological researcher. This kind of data has been collected from time to time. A round in NSS covers a certain number of items on which data is collected from the field and processed. The subjects covered are, household income, expenditure, rural retail price of selected commodities, employment and unemployment, demographic characteristics, size of landholdings, savings, etc. It reflects that the surveys conducted in addition to the regular censuses quite often can provide vital additional information for population scientists.

2.5 HANDBOOKS

Handbooks provide ready reference. It is a kind of book which contains reference work, set of instructions etc. It is also called by some as a *vade mecum* (Latin, "go with me") or pocket reference. This is so as its main purpose is to be easily carried around while looking for things.

We will find that handbooks may be based on any specific or specialised theme. Whatever the theme, it is always hugely informative. They are designed in such a way that they can be easily grasped by the reader and contain answers to questions related to the topic concerned.

It is to be noted that handbooks are not necessarily always pocket sized. They act as genuine reference books and deliver ready reference, for example *Economic Anthropology*, *Forensic Anthropology and Archeology*, *Religion and Health*, etc. Handbooks are widely used in the sciences and social sciences, including anthropology as quick references for various kinds of secondary data.

2.6 GAZETTEER

A gazetteer is usually described as a book or a part of a book which contains a list of names of places with information about them. It may also contain a map or an atlas with it. However this name is also used to describe a daily newspaper other than providing as a reference to give knowledge about places and their names.

A gazetteer conventionally includes data about the geographical composition of any country, locality, continent etc. It contains information about their physical features like roads, rivers, mountains, etc. It also provides knowledge about their population. Such information is of great help to the anthropologist who will be visiting the place of research for the first time.

BOX

Gazetteers are of different kinds based on the kind of information they provide. They are:

- World gazetteer: It is a geographic dictionary index which contains data of the world. It includes the geographic structure of a country/ area including its social statistics like literacy rate, GDP etc. Such gazetteers are easily found in libraries.
- Short-form gazetteer: It contains a list of names of places with their locations. This kind of referencing is found in place-name indexes of atlases.
- Long-form (or descriptive) gazetteer: In long-form or descriptive gazetteer, the description of places is given in length. It also includes the places' histories, maps, photographs etc.
- Thematic gazetteer: This contains a list of places according to a theme, for example famous buildings, markets, oil stations etc.
- Address gazetteer: This contains a list of addresses which are geo-referenced.

2.7 FILMS

Films can be viewed as a medium for recording events, as a form of entertainment or as a form of art. In all its forms it can educate and provide knowledge to society. In anthropology films are used as a medium or as a

secondary source to give more information about a particular society or about the ways of life or about any social event.

Not only are films seen as creating awareness about societal realities, but they also create new ideas in the minds of the viewer. Popularity of this medium led to its study which is called film theory and is now a recognised field in academics. Films can be studied from structural, feminist, artistic, psychoanalytic and many other perspectives. Disciplines including anthropology seek help from films as whatever is depicted in films can be seen as indicators of real life. Not only can the films, but their reviews also help in furthering anthropological research. Besides all genres of films, there are films which are specific to the study of anthropology. They are made within the realm of anthropology. While films in general may add to the development of a research, ethnographic films are made either to portray empirical evidence of a society's way of life (which surely helps in a new research) or is made in the process of a research as a visual representation or interpretation of the culture studied. Either ways, such ethnographic films can be used as a secondary source of data in one's anthropological research.

An ethnographic film records and reveals patterns of culture. In fact, other genres of films reveal such patterns as well. By reason of their content and form or both, all films are ethnographic as they all reveal cultural patterning in some way or the other in varied degrees. Though ethnographic filming became an institutionalised scientific discipline only during the 1950s, almost every people in the world had been filmed in one way or the other, some groups repeatedly or intensively, even before the turn of the century and the initial years. Ethnographic films developed from the fragmentary and idiosyncratic to systematic and thorough with technological and communication revolution of the 1950s. Moreover, ethnographic filming which began as a phenomenon of colonialism slowly evolved as a scientific discipline. Some films have even aided cultural renewal. The most exciting possibility of ethnographic films is to enable to record and review the range of patterns in the behaviour of man. According to Regnault (1931), films preserve forever all human behaviour for the needs of our studies.

Regnault, who rightly understood the importance of a film in preserving patterns of behaviour, was the first person to make an ethnographic film in the year 1895. He championed the systematic use of motion pictures in anthropology and proposed the formation of anthropological film archives. The first film made by Regnault portrayed Wolof woman making pots. The film showed the Wolof method of making pots in which the shallow concave wheel is turned by one hand while the clay is shaped by the other.

The Torres Straits Expedition led by A.C. Haddon was the turning point in the history of anthropology for it transformed the Nineteenth Century speculative anthropology into a scientific discipline with standards of evidence comparable to those of other Natural Sciences. A whole battery of recording methods was used such as genealogical method, photography and motion pictures. Haddon's ethnographic films are the earliest known to have been made in the field.

Haddon invigorated his colleagues to arrange themselves in order to conduct fieldwork with photographic gears. He believed in the advantages of film making in the field and expressed his thoughts in a letter to Baldwin Spencer

in 1901. Motivated by Haddon, Spencer with his partner studied the Australian aborigines by filming them for thirty years. Rudolf Poch took movie and stereoscopic cameras on his field trips to New Guinea and southwest Africa in 1904 and 1907. He made films of dance and sequences of children playing, of girls carrying water and a man being shaved with an obsidian razor.

The first use of the film in applied anthropology came towards the end of the pioneer periods of ethnographic filming. This was the origin of the colonial cinema. By 1912, it had occurred to the Americans who administered the Philippines that films might serve a purpose in native education, where a language barrier prevented giving lessons successfully by word of mouth.

By the 1920s the social documentary film came into being. It was basically used as a mass education medium sensitive to the needs of Government policy or of opposition politics in various countries. By this time the 'anthropological teaching film' had evolved its canonical form, the single concept films or ceremonies, craft and the like. Another form, the 'comparison film', was less common. In format the 'anthropological teaching film' was little over ten minutes to about an hour's duration, silent, with inter-titles which sometimes took up more than half of the film. After the adoption of sound in 1927, voice-over narration gradually replaced titles.

The middle 1930s was a very controversial phase for anthropological films. There was constant dialogue about its importance and acceptability. This shift towards filming and photography was directed primarily at recording the types of non-verbal behaviour for which there existed neither vocabulary nor conceptualised methods of observation in which the observation had to precede the codification.

The use of film to elicit responses was adopted to sociological research by Jean Rouch and Edgar Morin in the early 1960s. During this period, definition and typologies of ethnographic films were devised in accordance with probable use to which they can be put. Instruction in ethnographic filming, initiated by Margaret Mead in Columbia in the 1940s has, of late, become extremely popular. Jean Rouch and Robert Gardner, both visual anthropologists, trained individually a number of filmmakers in ethnographic filming.

The history of ethnographic films is rich in examples of unique capacity to record the multilevel nature of events, of its usefulness in teaching new ways of perception and of its power to evoke deeply positive feelings about mankind by communicating the essence of a people. Ethnographic films can be very useful if they are used as data which are incorporated in teaching. But as a form of public entertainment, they can often be embarrassing or uncomfortable. The idea that an ethnographic film speaks for itself is wrong.

Now-a-days, videotape recording has become very popular with both, the instructors and students of ethnography. The use of videotape in teaching ethnographic and participatory filming to students with little or no previous experience offers a number of advantages. These may be identified as simplicity, economy and speed.

The second advantage of videotape recording is the economy of production. The cost of videotape equipments and training are comparatively low, and due to its capacity to be reused repeatedly, the expenses of raw material are minimal

and that of processing, non existent. This is important because it is when the students are beginning to master filming techniques that they need to shoot most often.

The third advantage is that of speed in the processing of raw data. With videotape, the filmmaker student can review what he has filmed a minute earlier and assess his own level of achievement. If he is not satisfied with the result, there is every likelihood that he may be able to shoot the same scene over again, right way. Another important benefit is the opportunity videotape offers for getting feedback that will help in understanding and editing from the very people who form the subject matter of the videotape. This offers a chance to observe and interpret cultural material in a simple and speedy way.

2.8 MANUSCRIPT

It is any work or document that is written by hand as opposed to the printed word. It can be a writer's text or an article for publication. It can also define that information that is recorded by hand using other means, like making a graffiti, or chiseling on a piece of rock or making inscriptions on clay etc. In today's times, a handwritten piece of text would also include a typed text on a computer.

It is not the matter of a written work which defines a manuscript. A manuscript may have in it material like figures, diagrams, maps, pictorial decorations, etc. Manuscripts may be designed in the form of a book, a scroll or a parchment. In the past, before printing was invented, all written recorded material were in the form of manuscripts and their production and reproduction was done by hand. These were usually scrolls or codices and were made on vellum, papyrus and later, on paper. Examples of such may be the Bible, philosophical texts, administrative texts etc.

A researcher who looks for a manuscript in a library would try to look for any hand-written archived item. Such manuscripts may help in anthropological research to view the historical aspect of a topic to be studied.

As mentioned above, when it comes to books, magazines etc, a manuscript is taken to be the original written document. In film and in theatre, a manuscript implies the author's dramatized text.

Manuscripts in any form may be of secondary help to a researcher depending on the kind of data (s)he wishes to collect.

2.9 DOCUMENTS

A document is a formal piece of writing which is used as or acts as a record of events. It is generally a term used in business and Government circles. However it can also imply a film, a photograph, an audio recording or a digitalized document. Documents may be categorized as private, public or secret. Sometimes it is also called a draft or a proof.

BOX

There are accepted standards for specific applications which may can be defined as a document in various fields, such as:

- Academia: thesis, dissertation, paper, journal
- Business and Accounting: invoice, quote, RFP, proposal, contract
- Law and Politics: summons, certificate, license, gazette
- Government and Industry: white paper
- Media and Marketing: brief, mock-up, script
- Such standard documents can be created based on a template.

A document is either hand written with ink or it is mechanically produced either at a printing press or a personal printer. In the past, documents were written with handmade ink on dried leaves, papyrus, with sharp objects on stones, or stamped on clay.

BOX

Modern electronic means of storing and displaying documents include:

- Desktop computer and monitor (or laptop, tablet PC, etc.); optionally with a printer to obtain a hard copy
- Personal digital assistant (PDA)
- Dedicated e-book device
- Electronic paper
- Information appliances
- Digital audio players
- Radio and television service provider

In anthropology documents can be vital in providing formal information about the people and place to be studied. Documents can provide data regarding the political scenario of a community or can give information about their health status etc.

2.10 ADMINISTRATIVE RECORDS

In Government work a number of things are recorded as part of routine processes. For example, at the time of admission of children in schools/colleges, their age, parental occupation and income are recorded along with certain other particulars. Ration cards contain the name, sex, age and relationship with the head and every member of the household. In hospitals and dispensaries, records are made from the name, sex, and age of the patient along with the nature of the ailment. When people go to countries outside India or come to our own country from other counties, information is collected on number of items before embarking, or at the time of disembarking from the plane or the ship. The electoral rolls prepared at the time of elections provide the name, sex and age of the persons who are eligible for voting separately for each geographical area. The Labour Bureau collects many types of details about the working

population in the organised sector of industries, and the central and the state governments bring out publications giving information about their employees. Some of these data are published by the concerned organization at national level, some at the state levels and some at the lower levels of aggregations and some of the data are not published at all like the information related to the ration card holder. These and similar records become another source of data. While using these data, one must, however, be clear about the concepts and definitions used by the particular organisations for collecting the data, and also about the reliability of statistics published by them otherwise one may lend himself in a situation similar to the use of vital registration records which are completely unreliable for most scientific studies.

2.11 OTHER SOURCES OF DATA

Apart from these major sources of basic data, anthropologists, especially anthropologists studying demography, do make use of migration reports, linguistic reports, national and international reports, estimates and projections. The United Nations in recent years is increasingly assuming the responsibility of collecting vital population data from its member countries and reproducing and regrouping the same in a comparable form. There are some countries, though in a very small minority, which maintain proper migration records. Most of the developed countries do bring out migration reports from time to time which yield quite useful information for the population geographers. In the old world, China's pass book system for each family provides basic information at micro level. Similarly, in many of the countries which remained under British rule, linguistic reports have been prepared by the British which even today can form the basis for any analysis of this attribute. India was one such country where such reports had been produced by the British through the agencies of census operation. Similarly, the estimates which are attempted at annually in different countries are not the primary data but are derived from other sources. These estimates are produced in a variety of ways. For instance, the estimates may be derived from continuous population registers mentioned under registration systems. Secondly, these may be arrived at with the help of sample surveys. Thirdly, the estimates can also be computed by carrying the population from the previous census either by mathematical extrapolation of the past trends or by a component method using birth and death registration and symptomatic data reflecting migration. The quality of such estimates depends largely on the type of method used. Such estimates are usually published in national reports such as *National Statistical Yearbook*. Population projections relate to estimates of population for the future. These projections may be made for the total population or by age sex, marital status, manpower required, etc. The compilation projections at international scale are not as common as the computation of estimates.

2.12 SUMMARY

The collection of relevant data is a major concern for social scientists as well as anthropologists today. Each discipline seeks to get information as per its requirement depending upon its nature, scope and subject matter. Yet one of the fundamental requirements of each discipline is its dependence of socio-demographic information. Census, registration of vital (civil) statistics, sample

survey, population registers, administrative records, handbooks and gazetteers form major reliable sources of secondary data for the use of anthropologists. Besides these, historical records, manuscripts, documents, films, maps, and other sources of data like migration reports, linguistic reports, international and national reports, estimates and projections are also considered as reliable sources of secondary data.

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Sample Questions

- 1) What do you understand by secondary sources of data? Briefly discuss some of the useful sources of secondary data for anthropologists.
- 2) Define Census. Write an exhaustive note on "Indian Census through ages".
- 3) Why are Registration System and National Sample Surveys important to a student of Anthropology? What kind of secondary data do we generate from them? Discuss.
- 4) Write short notes on the importance of the following in the discipline of Anthropology:
 - i) Handbooks
 - ii) Gazetteers
 - iii) Films
 - iv) Administrative records
 - v) Documents
 - vi) Manuscripts

UNIT 3 BIOLOGICAL METHODS

Contents

- 3.1 Introduction
- 3.2 Anthropometry
 - 3.2.1 Instrumentation
 - 3.2.2 Quality Control
 - 3.2.3 Applications
- 3.3 Pedigree Analysis
- 3.4 Anatomical Method
- 3.5 Serogenetics
 - 3.5.1 Importance of Serogenetics
- 3.6 Summary
- Reference
- Suggested Reading
- Sample Questions

Learning Objectives



After going through this unit, you will be able to:

- know about the basic methods employed by physical/biological anthropologists while conducting research;
- learn how to use these methods in anthropological study;
- understand the significance of each method; and
- critically evaluate these methods for further enquiry.

3.1 INTRODUCTION

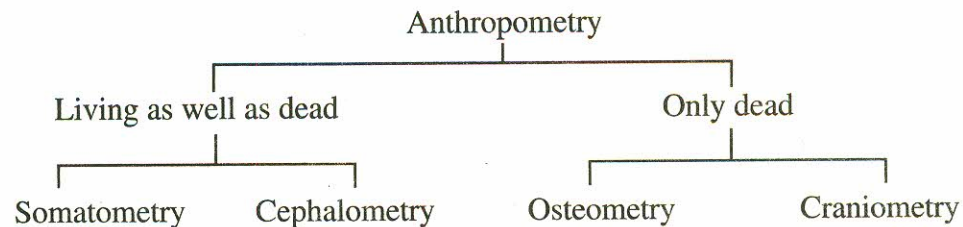
One of the chief aims of physical/biological anthropologists is to understand human variation. In pursuit of this idea, the physical/biological anthropologists use the following research methods in their studies. They are— anthropometry, pedigree, anatomical method and serogenetics. In addition to the above methods, present day physical/biological anthropologists apply all the techniques of modern molecular biology to achieve fuller understanding of human variation.

3.2 ANTHROPOMETRY

Anthropometry is the measurement of size and proportions of human body (living or dead). It provides scientific methods and observations on living human body and skeleton. Anthropometry represents the typical and traditional tool of human biology, physical anthropology and auxology. The origin of anthropometry is very ancient. As long ago as the Egypt and the Greece civilizations, artists formulated various standard canons for the human body.

Scientific anthropometry began with Blumenbach, who laid the foundation of anthropometry. Paul Broca, W. H. Flower, Rudolf Martin etc., made further development to this sub-field of physical/biological anthropology.

(Anthropometry is subdivided as follows:)



Somatometry : The measurements of the body in the living and in the cadaver

Cephalometry : Measurements of head and face in living and in cadaver

Cranimetry : Measurements of skull

Osteometry : Measurement of skeleton and its parts

Anthropometric measurements include those of the whole body, such as weight and stature (standing height). Also, anthropometry assesses specific areas of the body, as with circumference measurements around a body part, like the arm or skull. Furthermore, specific body tissues can be estimated through anthropometry. For example, adipose tissue under the skin (subcutaneous fat) can be measured by collecting skin fold measurements, which consist of skin and fat existing above skeletal muscle. In addition, anthropometric data include various ratios and indices of the body dimensions. Such calculated measurements can yield information about the relative size or shapes of the whole body or its parts.

The advantages of anthropometric measurements are that they are easy to collect, can be performed with simple equipment, and are obtainable with minimal disruption to those being measured. Moreover, because the equipment needed for collection is portable, anthropometric measurements can be obtained in a variety of settings, including laboratories, hospitals, private residences, community settings and outdoor environments. Further, the collection of anthropometric data is relatively inexpensive and useful for collecting large data.

3.2.1 Instrumentation

Depending upon the objective, anthropometric techniques involve instrumentation that may include weighing scale, anthropometer, skinfold calipers, spreading and sliding calipers, tape, body volume tanks and bioelectrical impedance analysers that are used for measurements of the body size and body composition. Similarly, radiographic instruments and X-ray scanners such as dual-energy-ray absorption meters and ultrasound densitometers are used for quantifying cortical bone density, bone mass, subcutaneous fat density and lean body mass.

3.2.2 Quality Control

Anthropometry follows a rigorous set of guidelines that include standardisation of the measurement techniques, uniform landmarks, and establishing conditions of the measurements. Despite its simplicity, it requires a great deal of quality

control to ensure minimal error of measurements. Such an objective is usually obtained through meticulous training in the technique that results in replicable measurements.

Activity

Name two anthropometric equipments and write about what they are used to measure and how does these measurements help in anthropological study.

3.2.3 Applications

In physical/biological anthropology and human paleontology, anthropometry is the technique of choice for quantifying variability and relationship of fossils and extant populations. Anthropometric measurements of the head, face, and long bones are also used in analysing fossil taxa (using measurements from radiographs). Mathematical approaches are used in describing the size and proportions of various fossil hominids.

Anthropometry is the most universally applicable, inexpensive, and noninvasive method available to assess the nutritional history throughout life. It has been used to assess and predict the health, nutritional history, welfare, performance, and survival of non-industrialised and industrialised societies.

Anthropometry is also essential to the field of forensics, specifically forensic anthropology which is concerned with the relationship between medicine and law. Forensic anthropologists (so-called bone detectives) make extensive use of anthropometry in human identification, whether for isolated cadavers, commingled remains, victims of mass disasters, or genocide victims. Anthropometric measurements of head and face are also extensively employed in orthodontic diagnosis, in treatment planning, and orthodontic treatment. Measurements made from cephalometric radiographs also serve in identification of syndromes. Further extensions of cephalometry measurements of the living human head, in three dimensions (Cartesian anthropometry), are used in sculpting head forms not just for equipment design but for use in the plastic and reconstructive surgery of accident victims. Forensic anthropologists are involved in identification of human remains using techniques that include direct skeletal measurements, allowing the identification of age at the time of death, sex, and cause of death; and also deduction of age at the time of death, sex, and cause of death, and deduction of life history of the deceased. For example, identification of healed bone fractures, age, and sex of Neanderthals has permitted anthropologists to infer the life-span and hunting techniques used.

The use of anthropometry for the design of clothing, equipments of all sorts, and interiors is relatively new in the history of humankind. For example, use of anthropometric techniques to establish human dimensions and design gas masks, oxygen masks, dust masks, and respirators as well as military helmets. Anthropometry has enabled the production of clothes that accurately match the various sizes of a population. The dimensional standards used for sports equipment and military applications have been designed to match the distribution of size in the population as a whole. Hence, anthropometry plays an essential role in the armed forces, by providing information about the necessary dimensions for military equipment of all sorts to accommodate individuals in military service. Similarly, the equipment used in space demands knowledge of human dimensions. Anthropometry has evolved from manual to

automated approach, whereby measurements are entered directly into the computer for data processing.

Thus, anthropometry plays an essential role in all areas of human endeavour concerned with the relative and absolute quantification of the human body. It serves a profound function in all aspects of science and human activity.

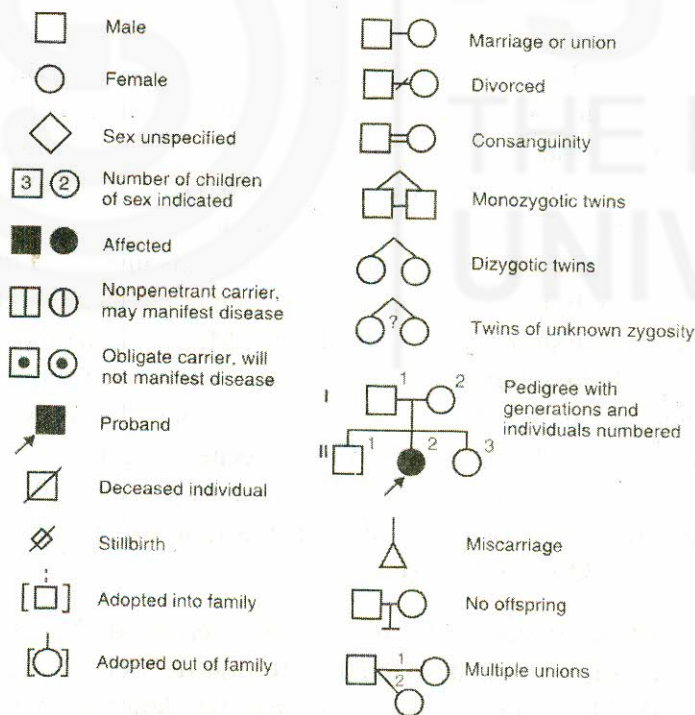
3.3 PEDIGREE ANALYSIS

Pedigree analysis is the classic method of human genetics. Long before Mendelian principles and Mendelian ratios, it was being used to identify inherited traits and infer patterns of transmission. It is an important method used in genetic diagnosis and research. According to Bennett (1999), pedigree is an important method of establishing patient rapport, and serves as a visual demonstration for providing patient education (e.g., variation in disease expression in a family), as well as identifying order or relatives at risk for disease or who can be informative for inclusion in genetic research.

Pedigree is a family history of hereditary condition or diagram of a family history indicating the family members, their relationships to proband, and their status with respect to a particular hereditary condition.

BOX

The following are the commonly used symbols in pedigree construction:

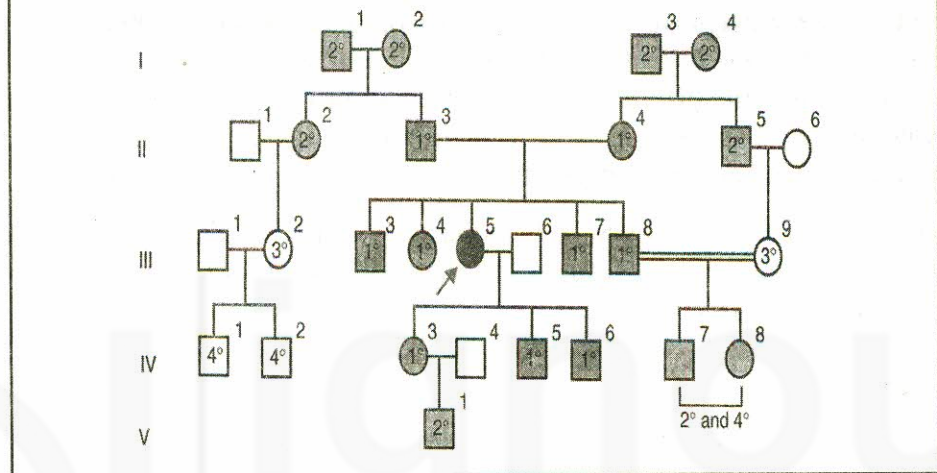


The pedigrees published in American and most continental journals look very different from many of the pedigrees published in their British counterparts. In the former, squares represent males and circles females, whereas the British in their pedigrees favour the standard sex symbols: a ♂ for the male (the mythological sign of Aries [Mars; shield and spear]) and ♀ (the mirror of Venus) for the female. In the square-circle system, unknown sex is usually shown by a diamond; in the British system by a circle. Almost all published pedigrees, however, contain many elements in common.

Typically a pedigree includes two generations of ascent from the consultant (the person requesting medical or genetic information) or proband (the affected individual that brings family to medical attention), and two generations of descent. Information is usually collected on first-degree relatives (children, siblings and parents), second-degree relatives (half siblings, aunts, uncles, nieces, nephews, grandparents and grand children), and sometimes third-degree relatives (e.g. first cousins).

BOX

The following is a typical pedigree presented for self explanation:



Pedigree analysis helps the researchers to determine if a trait is Mendelian. It also helps establish the mode of inheritance. The first step in pedigree analysis is to observe the number and relationships of all individuals who express the same or similar clinical features. From this, it should be possible to determine if the disorder is dominant or recessive, autosomal or X-linked by looking for the typical patterns of inheritance. For example, an autosomal disease can usually be distinguished by seeing male-to-male transmission of mutation, but since males pass only the Y chromosome to their sons, there should never be father to son transmission of an X-linked gene. Males will be most commonly affected in an X-linked disease, whereas males and females should be equally affected in autosomal disorders. In general, a dominant disease will be seen in approximately half of the individuals in each generation, but recessives occur very rarely. If the mutation is in the mitochondrial genome, affected mothers will pass the trait to all of their children, but none of the offsprings of an affected male should have the disease.

Once the inheritance pattern of the disorder is determined, the status of family members in the pedigree can be evaluated. By carefully observing the position of affected individuals, mutation carriers may be identified. From this data, the risk of carrier status for other family members or the chance that a couple may have an affected child can be estimated.

Thus it can be used in segregation analysis, heritability, calculation of inbreeding coefficients and in studies of linkage. The complexity of pedigree analysis has greatly increased in recent years in order to deal with quantitative inheritance and with those conditions that are phenotypically the result of a number of variables. Further, its usefulness will continue to develop in tandem with the growing spectrum of molecular, bioinformatics and proteomic tools.

Activity

Jane has three younger brothers and one sister who is the youngest. They all have blue eyes. Their parents are Kate and Edward. The mother, Kate has blue eyes but their father, Edward has brown eyes. Draw a pedigree chart of this family and identify the mode of inheritance. Also state why it is so.

3.4 ANATOMICAL METHOD

One of the important goals of physical/biological anthropology is to understand the human origin and its relation with non-human primates. The second goal of physical/biological anthropology is to understand physical variation in human extinct and extant populations. To achieve these goals, physical anthropologists use the knowledge of comparative anatomy, skeletal biology and human osteology and anthropometry which are the important components of human anatomy. Human anatomy is the science which deals with the structure of human body.

Comparative anatomy is one of the major subdivisions of anatomy which deals with the morphological changes of different parts of human body in comparison to other animals. However, physical anthropology deals with the external features and measurements of different human populations and with the study of the prehistoric remains.

In order to study human body for various purposes, particularly for anthropometric studies, it is necessary to know the various planes, position and terms related to movements of the human body. They are:

Positions – anatomical, supine and prone.

Planes – transverse, median and coronal planes.

Terms used for various regions of the body are ventral or anterior, dorsal or posterior, medial, lateral, proximal/cranial/inferior, superficial, deep etc.

Terms related to body movements – flexion, extension, abduction, adduction, supination, pronation etc.

Terms used for describing bony features – elevations, depressions, openings, cavities and smooth articular areas.

The attainment of accuracy in anthropometric measurements requires a great deal of practice. Theoretically the methods of measurements seem to be quite simple. However, these are not so. One has to have some knowledge of anatomical structures of bones of the body, accuracy of marking the landmarks, experience of using the equipments with a standard technique with precautions thereof.

Physical/biological anthropologists require adequate knowledge of human osteology for forensic anthropological work and archeological findings. Anatomy plays an important role in identification of skeletal remains and reconstruction of age, sex and ancestry of a particular skeleton. In view of all the above aspects, the knowledge of human anatomy is very essential for a physical anthropologist.

3.5 SEROGENETICS

Of the many examples of Mendelian inheritance known in humans, a great proportion of concern is inherited from differences in components of blood. Blood is the only tissue routinely sampled for a wide variety of medical procedures as well as theoretical scientific studies. With modern equipment, anthropologists working all over the world can preserve and ship blood samples to laboratories for intensive study of genetic characteristics.

Blood is a complex fluid in which a variety of cells are suspended. If a sample of blood is placed in a tube and the tube is spun rapidly in a centrifuge, it will separate into cells and form a yellowish liquid called plasma. When components responsible for blood clotting are removed from blood then it is called serum, a clear, straw-colored liquid consisting of water, proteins, salts and other components. Some inherited variants are found in the protein portion of the serum. Others affect the chemical structure of hemoglobin, the protein that colors red blood cells that transport oxygen and carbon-di-oxide. Still others cause differences in the chemicals that coat the surfaces of RBCs.

These chemicals are called antigens and the study of loci that control the formation gives us much useful genetic information. Red blood cell antigens are a part made up of protein and part carbohydrate. Each cell has many antigen molecules on their surface but not all of them are alike. Their differences are controlled by a number of separate genetic loci, and different alleles at each locus cause further diversity. The term antigen actually refers to a wide range of complex protein molecules having a common function. When introduced into the body of an animal, antigens stimulate the production of antibodies, small proteins in the blood plasma that normally protect the body by destroying foreign antigens such as compounds on the surfaces of viruses or bacteria.

When an antigen and its corresponding antibody are brought together, usually some visible effect is produced. Agglutination, or the sticking together of red cells and antibodies in a blood sample, is one such effect; lysis, or rupture of the cells, is another. When one antibody is mixed with blood drawn from different people, some samples will show no reaction, while other samples will agglutinate or lyse. People who give the same reaction to an antibody share a common antigen and usually the antigen belongs to the same blood type.

Human blood can be classified into different groups based on the reaction of RBC with different antibodies (naturally acquired antibodies and immune antibodies). Some anthropologically important blood group systems which are extensively studied are ABO, MNS, RH, LU, JK, LW, RAPH, Kell K, Duffy Fy, Diego Di, Xg etc.

Genetically determined markers on the surface of WBC called human leukocyte antigens (HL-A) are also studied for various purposes. In addition, study of hemoglobin and its variants, serum proteins, red cell enzymes can be studied with the help of electrophoresis.

3.5.1 Importance of Serogenetics

The genetic markers of blood are useful to know their distribution in human population, which help to understand migrational movements, micro evolution and their susceptibility to various diseases. Genetic markers in the blood of

non-human primates help in understanding human origin. Genetically determined markers on the surface of cellular blood elements (red and white blood cells, platelets) have medical, legal and anthropologic importance. ABO and Rh groups are useful in blood transfusion. HL-A present on WBC has paramount importance in organ transplantation. It also plays a vital role in forensic investigations such as crime scene blood stain identification and paternity confirmation. Anthropologically, some blood groups are unique to specific populations and can be a reflection of tribal origin or migration patterns. Blood groups are also valuable markers in gene linkage analysis, and their study has enormously contributed to human gene mapping.

In view of the above importance, physical/biological anthropologists extensively study serogenetic markers among human populations. In addition to the above methods, present day physical anthropologists also apply all the techniques of modern molecular biology to achieve fuller understanding of human variation.

3.6 SUMMARY

To summarize, this unit teaches the learner about the four important methods used practically in physical or biological anthropology. These methods help the student to know and utilise the techniques to learn various aspects of human beings. This may be on learning about evolution through anthropometric measurements of skeletons of the past or knowing their present equivalents through anthropometry; knowing about diseases passed through heredity with the help of pedigree analysis; learning about human anatomy which helps in comparative study of humans and primates or again, like in anthropometry, about changes through evolution in the human body; and also gaining knowledge on how the study of blood samples tell us about different genetic diseases, about human migration, evolution etc. This unit is important for a learner who is interested in the physical dimensions of human life and would like to grasp more by applying these techniques pragmatically.

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Suggested Reading

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Sample Questions

- 1) Describe Anthropometry and its applications.
- 2) Describe various inherited components of blood and its significance.
- 3) Pedigree analysis is an important method in genetic diagnosis and research – Explain.
- 4) Discuss the role of anatomical method in physical anthropological studies.

UNIT 4 ARCHAEOLOGICAL METHODS

Contents

- 4.1 Introduction
- 4.2 Exploration
- 4.3 Excavation
- 4.4 Classification
- 4.5 Archaeometry
- 4.6 Summary
- Reference
- Suggested Reading
- Sample Questions

Learning Objectives



Once you study this unit, you are able to understand the following:

- intricate details of archaeological fieldwork;
- significance of archaeological explorations and excavations;
- methods of exploration;
- methods of excavation;
- various documentation techniques;
- introduction to classification; and
- introduction to archaeometry.

4.1 INTRODUCTION

One of the primary objectives of archaeological study is to unravel the human past through material remains. A series of techniques are employed to achieve this goal. The first and foremost exercise is locating the archaeologically potential area; a site or a region and assessing its cultural wealth. The kind of evidence an archaeologist looks for is an artifact, a structure, a feature or an ecosystem within which the humans survived. This gives an interdisciplinary shape to archaeological operations. An archaeological operation involves identifying a potential area, systematically collecting the data, organising them, situating it in a specific cultural period by using either one or a series of dating methods, conserving and preserving them and also interpreting them. The first step of any archaeological investigation is exploration and the details of the same are given below.

4.2 EXPLORATION

This is an interdisciplinary investigation, which aims at locating and understanding the potentials of an archaeological site.

An archaeological site is based on several factors. Usually an archaeological site has a deposit which was formed as a result of cultural and natural processes. An archaeologist should have an eye to locate these cultural and natural marks on the landscape. Therefore, prior to proceeding for exploration an archaeologist should have an overall idea of the region which he or she is going to investigate. This knowledge can be obtained from studying various types of maps. The most important map that an archaeologist should be familiar with is the map showing different geographical features, roads and rail tracks, mountains, hills and hillocks, water bodies, vegetation and important buildings and other important features that are marked with the help of symbols (e.g: Survey of India maps). The other important maps that are useful for an archaeologist are specialised maps, such as, geological map, vegetation maps, agricultural maps, soil maps, rain fall maps, maps showing natural resources and any other such maps, which indicate isolated but specialised features. An archaeologist should have the capability to read these various types of maps. This will allow him/her to identify a geographical region, which would have attracted humans there either for a settlement or for any other cultural activity, which is primarily leading to subsistence, food procurement or production, exchange of goods, production of various types of materials, administration etc. The nature of an archaeological site changes as per the cultural periods. For instance, in a Prehistoric context the definition of an archaeological site means an activity area (usually represented by find spots of artifacts, factory site or an open air or rock shelter) to temporary settlements/camps. An artifact is an object used by humans by fashioning a naturally occurring material or transforming a naturally occurring material to a desired form/shape/composition to achieve certain cultural needs. To cite a few examples, stone tools, bone tools, metal tools, various weapons (made of stones, wood, bones, metals etc), utensils (made of baked clay, metals), art objects, construction materials and a wide variety of similar materials fall under this category. Majority of the Prehistoric Period sites are defined by the find of a single artifact or a cluster of artifacts and its associated materials indicating a cultural process. In case of the former, the archaeologists try to locate it within an environmental region and try to derive the activity of humans in that area in relation with the surroundings. This leads to the study of Prehistoric cultures along a river valley, or a lake bank or a foothill or any kind of environmental setting. In case of the latter it leads to drawing inferences on manufacture of tools and weapons by considering the features of the quarrying regions, amount of quarried materials, amount of tools / weapons produced, amount of waste produced, nature of waste and its technique of production. This kind of study allows us to appreciate the cultural development of simple as well as complex societies. A simple society can have the following characters: (i) use of a variety of stone tools, (ii) knowledge of fire control, (iii) knowledge of raw material processing, (iv) knowledge to alter the surrounding environment at a minor scale through irrigation and water management, and (v) knowledge of basic agriculture and domestication of animals while a complex society can have along with the above mentioned features, the following characters: (i) writing, (ii) administration (polity), (iii) town planning, (iv) social organisations, (v) social order (justice), (vi) organised religion, (vii) craft production and its organisation (specialised and non-

specialised), (viii) surplus production, (ix) trade, (x) networks of transportation and communications, (xi) organisational power and (xii) defense system. With the aforesaid understanding, we realise that societies in the past had achieved knowledge through a series of cultural evolutionary processes and upgradations. These significant changes are portrayed in the cultural assemblage, through which, it is evident that humans had developed substantial knowledge of the earth's resources and its utilitarian aspect for enhancing qualities of life. Therefore, when one looks for an archaeological site, the parameters under consideration changes from localities to localities, cultural periods to cultural periods. In an archaeological context, one observes artificial mounds in those areas where cultural deposits are buried, either in isolation as small villages that expanded to big urban centres or independently as each one of it, existed over a period of time. The artificial mound visible in an archaeological site is probably a mere remnant of the original site. The artificial mound differs in its appearance from natural mounds in many ways. Firstly, it will reveal a large number of cultural materials on its surface and within it. The pattern of vegetation on a cultural mound will be very less in its intensity from that of a natural mound. There are several ways of locating artificial mounds. One of the ways of locating archaeological sites would be with the aid of religious literature. The best example of this type of exploration is of Sir Alexander Cunningham who located the sites of Buddhist antiquity through the Buddhist sacred literature, *Tripitakas* and travelogues by Hiuen Tsang and Fahien. Another way to locate sites with ancient habitation remains would be to conduct village to village surveys and inquire with the local people if at any place pottery shreds (commonly identifiable material) are visible, if any mound is there etc. The folklores and certain specific terms in local languages also can be used to locate archaeological sites.

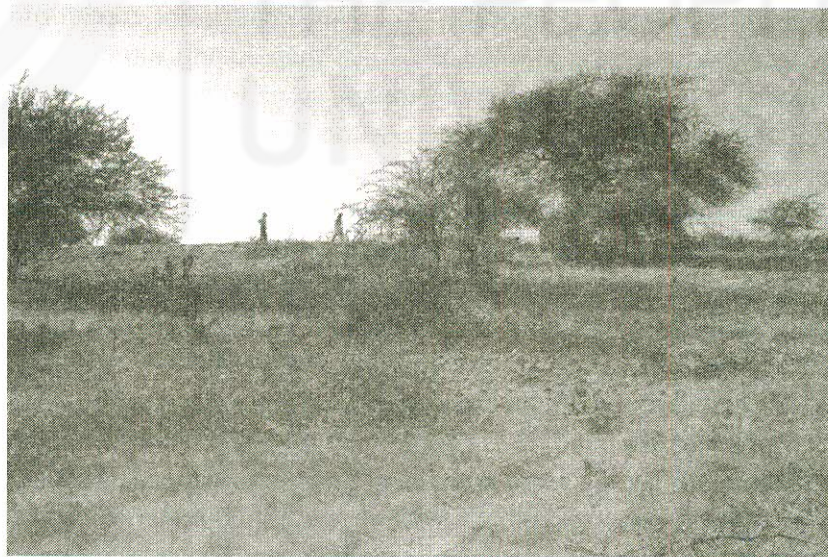


Fig. 1: General view of an archaeological mound

Source: From author's personal collection

BOX

In different parts of India artificial mound (Fig. 1) is referred to by a different name. In the Punjab Sind area mound is referred to as '*Daro*', in Gujarat '*Timbo*', in Maharashtra it is referred to as '*Pandri*' i.e. Whitish soil (it denotes the presence of ancient settlement) and in the eastern zone it is referred to as '*Dhibi*' or '*Danga*' for mound. In Southern India places with ancient settlement are referred to as '*Nattamedu*' or '*Nattakkollai*'

There are several other systematic methods of exploration: field walking, aerial photography, magnetometer survey, electrical resistivity survey, probing, remote sensing and also with the aid of geographical information system. These can be briefly mentioned as follows:

- i) **Field Walking:** Field walking is one of the oldest and authentic methods of surveying any region. In this a team of archaeologists survey an area intensely by covering almost all parts. The advantage with this method is that in this process the chances of missing out even a small activity area is less.
- ii) **Aerial Photography:** This method enables an archaeologist to have a bird's eye view of the archaeological mound and its surrounding area and gives the total outline of any feature. It plays a major role in distinguishing features which are otherwise invisible when looked from the ground level.
- iii) **Magnetometer Survey:** In this procedure an instrument called proton-magnetometer is used to identify structures or features which exhibits the property of thermoremanent magnetism (e.g: hearths, kiln, brick structures etc.). It detects anomalies or differences between the general magnetic field of an area and the one above or near the buried features or structures. The use of the proton-magnetometer is based on the electrodes fixed into the ground at regular intervals and the anomalies between the electrodes can then be plotted.
- iv) **Electrical Resistivity Survey:** The electrical resistivity survey is based on the fact that the ground can conduct electricity. The electrical conductivity of an archaeological mound would vary from area to area. Negative resistivity anomaly would show a ditch or pit and conversely positive anomaly would indicate a structure of high resistivity such as wall, floor etc. This is measured with the help of resistivity meter. This survey method aids in tracing the structural activities.
- v) **Probing:** This type of survey is done using an apparatus consisting of an iron bar with a tapered point and a T-handle and used to probe an activity area. The texture of the soil of each stratum emits a different sound and the resistance is different.
- vi) **Remote sensing:** It is one of the modern techniques that is used to uncover archaeological data with the help of aerial photography and satellite imageries. This method allows archaeologists to have an overall idea of the features on a given landform, which is otherwise difficult to view while standing on the field. A series of geophysical methods such as Ground Penetrating Radar (GPR) and magnetometric methods fall under this technique.
- vii) **Geographical Information system or Geospatial Information System:** This is increasingly becoming popular in archaeology. With the help of this, one can capture, store, analyse, manage and present data that are linked to locations of archaeological significance. In simple language it can be said as merging of the data derived from cartography, statistical analyses and data base technology.

Once a site or artifact cluster is located, its position is recorded by taking its geo-coordinates (geo-coordinates means recording of the latitude and longitude of a place. Latitude is the angular distance north or south of the earth's equator

measured in degrees along a meridian as on a map or globe. Longitude is the angular distance between a point on any meridian and the prime-meridian at Greenwich). This can be done either with the help of a map or with the help of a GPS (global positioning system). The importance of doing this is to help the later workers to locate the site, as we have several places with the same name.

All available features on the sites as well as the features of the surrounding region need to be recorded while exploring a site. A sound exploration helps in understanding many archaeological issues with regard to site or region under study and it further helps in raising pertinent questions that can be answered through excavation. The nature of excavation would depend on the kind of questions raised during the exploration. Through systematic exploration of a site, one can also identify promising activity areas within a site. While exploring, an archaeologist should also try to look for the possible cultural and natural transformations through which the site may have passed during the past many years. The following information need to be recorded during exploration:

- 1) Date of exploration, name of the site, taluka, district, state, latitude, longitude, how it is reachable from the nearby village or town, its distance from the nearby village or town.
- 2) The general topographic features of the region, rate of rainfall, fluctuations in temperature throughout the year, the kind of vegetation seen around, the agricultural potentials of the land, and the natural resources available within and around the region. It may also be useful to record the traditional occupations of the people in the neighboring villages, the history of the present day neighbouring villages, the social hierarchy in these villages and the total population of the present villages.
- 3) Nature of the site: a camp, village, town, mine, earthwork, cemetery, religious centre, its condition (degree of preservation), approximate area and thickness of the archaeological deposit, and a rough cultural sequence (if possible). One must also collect any available written records on the site or the region, sketches and photographs. While photographing one must keep in mind to photograph: (i) the overall shape of the mound, (ii) activity areas in the site, (iii) structures, projections and depressions within the site (proper scales or any objects of standard size may be used as a scale while photographing. Human scales may also be used to give an idea of the height of the mound, a section or any other similar features).
- 4) Details of the immovable antiquities and monuments, plan, elevation, position, section, condition, size and material on which it is built, details of sculptures, inscriptions etc. and their photographs.
- 5) Details of movable antiquities, methods adopted for their collection, their surrounding features and their probable relations with these features, rough sketch of the site, tentative classification of the archaeological finds.
- 6) Details of their packing, labeling and sketches etc.

The aforesaid exercises would allow the archaeologist to record a site/region systematically, collect information to arrive at its relative chronology, to situate a site in a regional cultural context, understand its potentials and raise pertinent questions for further research. Please see Chart (Figure 2: Form for recording data) to get an overall idea of the most essential things to be recorded while exploring sites. The investigator may use this chart while doing recording of the sites.

Exploration Card	
1. Site name, its geo-co-ordinates	6. Antiquities found during exploration
2. Approach to the site	7. Ceramics recovered
3. Physical features: elevation, river system, natural resources.	8. Owner of the site
4. Antiquity of the area.	9. Date of exploration
5. Degree of preservation	9. Name and address of the explorer

Fig. 2: The chart above represents a site card or a site sheet

The data tabulated above is explained below:

Key to Figure 2

- 1) **Site name and location:** The site should be identified by the name of the nearest village. The taluk or tehsil, the district and the state should be indicated. The latitudinal and longitudinal data need to be recorded.
- 2) **Approach to the site:** The nearest railway station or bus station should be recorded and the direction to reach the exact spot should be given.
- 3) **Topographical features:** The elevation of the site, proximity to water source, surrounding topographical features, available natural resources such as rocks, minerals and natural vegetation. One needs to record them as the information gathered would help in conducting a site-catchment analysis.
- 4) **Antiquity of the area:** The archaeological context of the site needs to be mentioned based on the surface findings and the reference to any account of the site in historical or archaeological publication should also be mentioned.
- 5) **State of preservation of the site:** The manual destruction and natural destruction of the site should be mentioned and the degree of destruction should also be mentioned along with the medium of destruction. These may be referred to as natural (fluvial or aeolian) or cultural (agriculture, construction, quarrying etc.).
- 6) **Antiquities recovered:** The antiquities and other artefacts recovered during the process of exploration need to be recorded in a written format as well as through photographs so that these can serve as future reference material.

4.3 EXCAVATION

"...the archaeological excavator is not digging up things, he is digging up people; however much he may analyse and tabulate and desiccate his discoveries in the laboratory, the ultimate appeal across the ages, whether the time-interval be 500 or 500,000 years, is from mind to intelligent mind, from man to sentient man". (Wheeler, 1954)

The above mentioned extract is from the book *Archaeology from the Earth* by Sir Mortimer Wheeler. Here he draws a line between simple antiquarian activities and systematic archaeological recoveries. The importance of systematic recovery of antiquities has been further summarized by Wheeler in the following words: *"I have said that we cannot properly understand the past unless we have a living sympathy with the human stuff which its relics represent. We cannot understand, for example, the structural mechanism of an ancient burial-mound unless we can bring to bear upon its details a rational imagination capable of comprehending and vitalizing them. If we fail to do that, we are not humanists but mere collectors of dejected minutiae, signifying almost nothing. We would be better employed collecting bus-tickets, an occupation which at least involves no damage to scientific evidence"* (ibid). Excavation is the systematic mode of destructing a site by recording them properly and also by revealing its cultural sequence.

Excavation is the systematic and scientific method of uncovering the past. Through this process the cultural remains are brought out with utmost care. The nature of the excavation depends primarily upon the character and needs of the site and the methods of excavation can also vary depending on its objectives. It is essential to have an index trench in any excavation. This goes up to the natural soil and it gives us an idea about the cultural sequence of the site. Depending on the nature of the site, such as, architectural features, diverse activity areas etc., it is to be decided whether there is a need to excavate the site horizontally. However, Wheeler points out that, *"the old practice of cutting trial trenches, of making sondages, as a preliminary to, or even in lieu of, area-excavation was frequently a substitute for intelligent thinking and clear aiming...Trial-trenches rarely prove anything, save of the most general kind"* (ibid).

BOX

Horizontal excavation is generally employed for a habitation site so as to know the area of its extent. However to undertake a horizontal excavation certain pre-requisites need to be considered:

- Conveniently and clearly sub divide the site for record and control;
- Capable of easy, progressive expansion in any direction without breaking down or impairing the preliminary datum lines;
- Capable of preserving for constant reference at a maximum number of points complete vertical sections until the last phase of the excavation;
- Capable, ultimately, of easy integration into a continuously exposed regional excavation;
- Readily accessible at all points for the removal of soil, without hindrance from intervening cuttings or traffic across excavated surfaces; and
- Sufficiently open to the sky to ensure the easy inspection of well-lighted sections at all required depths.

The layout of the horizontal excavation is based upon a square (Fig. 3). It is a series of squares or grids separated by a baulk measuring around 50cm. The baulk is the unexcavated region and is maintained intact till the end of the excavation and this act as the four sides of each trench. It also allows the preservation of the vertical sections at the site. The trenches are laid out facing north. The reference peg is always the north-western peg. All the diggings are controlled with the depth being recorded after every dig from the pre-decided reference peg. After each dig, the material is systematically sorted out with great care so that each and every artifact is recovered. The position of each find within the trench is also recorded. This is important for further interpretations. In most of the cases a three-dimensional measurement is taken in relation with the reference peg. In this the depth, distance to the point, where the artifact is found, from two sides (one from the nearest section horizontally and the other from the reference peg at an angle) are taken. This recording is important as this allows working out the relation of the artifact with its associated materials (Fig. 4). After the trench reaches its natural soil or the virgin layer (a layer which does not have any cultural material), the layers are marked based on a set of features, such as, its colour, texture, composition and nature of cultural artifacts.

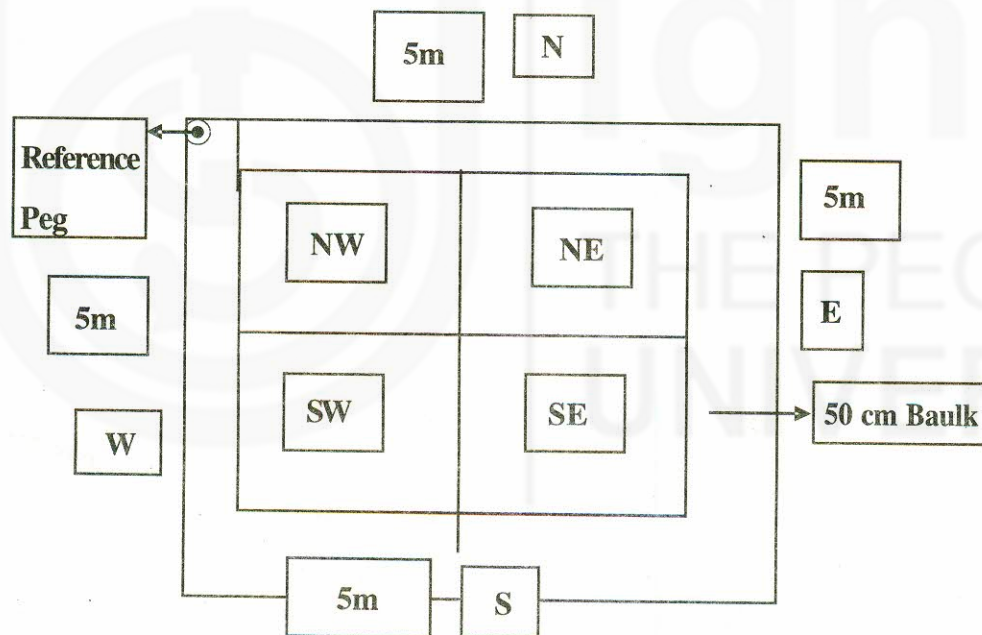


Fig. 3: Trench Layout

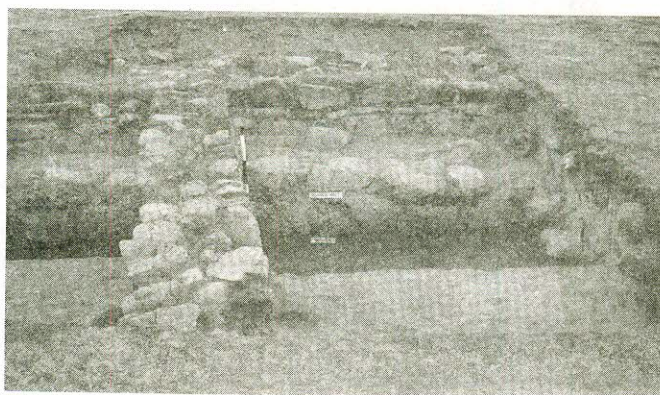


Fig. 4: Trench View after excavation

(Courtesy: Department of Archaeology and Ancient History, The Maharaja Sayajirao University of Baroda)

Burials are also encountered at the site. Burials (Fig. 5) are exposed based on the quartering or the quadrant method. The burial is marked out into four quarters by two strings, laid preferably to the cardinal points of the compass and over the approximate centre. Opposite quarters are excavated in turn. A convenient width of unexcavated area is left between each quadrant in such a fashion as to give a complete transverse section across the mound in both directions (ibid). For recording the excavated material from burials, reference points are fixed at successive intervals and the three dimensional features of the artifact /structure/feature insitu are recorded with reference to the aforesaid points (ibid).

One of the most important observations, that need to be made while excavating, is the recording of stratigraphy. The principle of stratigraphy is based on the law of superimposition. This means that the earliest deposit is at the bottom followed by succeeding deposits. Therefore, it is easier for an archaeologist to identify which is the earlier and which is later. The periodization is done based on the relationship of different strata with different structural phases. Each layer is designated by an encircled Arabic numeral, while the cultural phases are designated by Roman numerals. The layer numbering is always done from the top based on the order of exposing (Fig. 6) while the periodization is done always from the bottom in ideal cases. In case of secondary deposits the periodization may follow a different pattern. The most common feature that one comes across in an excavation is pit or dump. In case of pits, its date is taken as contemporary to the sealing layer, while in case of dumps its date is taken as contemporary to the resting layer. Recording of excavated data is done systematically and carefully. In major excavations, that yield a lot of ceramics and bones, pottery yards and bone yards are made to keep the pottery and bone finds as per its stratigraphic context.



Fig. 5: A Megalithic burial from Ibbankatuva, Sri Lanka

Source: From author's personal collection

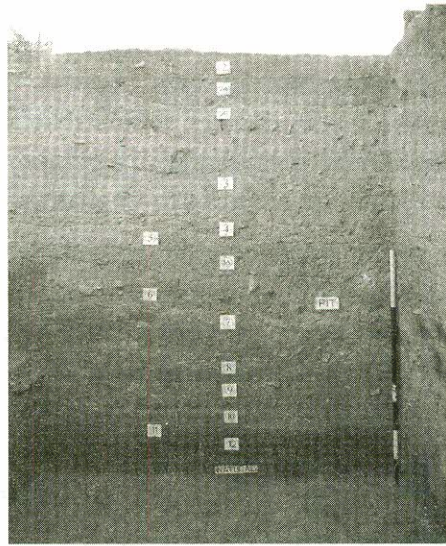


Fig. 6: Section of an excavated trench with layer numbers

Courtesy: Department of Archaeology and Ancient History, The Maharaja Sayajirao University of Baroda

This system of pottery yard or bone yard enhances the post-excavation data processing considerably. The data thus obtained is then processed through a series of analyses, which includes documentation, classification, quantitative and qualitative analyses, typo-technological analyses, socio-cultural analyses etc. The data thus collected is stored in proper places with adequate labeling.

The final report of an excavation is written by compiling the daily notes prepared by the excavator. Therefore a common understanding is essential among the excavators, while writing the daily notes.

The following points should be kept in mind while excavating and writing the daily notes:

- 1) To begin with, background information of the site is necessary. All those factors, which are listed under 'exploration', need to be incorporated while giving this information.
- 2) The purpose of putting the trench, its identification number and its relation with the surrounding trenches.
- 3) Measurements are usually taken in relation with the northwestern peg of the trench and the datum line (depths in a trench are measured from the datum line using + or – symbols).
- 4) After each dig the newly exposed surface is scraped, brushed and the observable features are recorded.
- 5) For convenience, the trench is usually divided into four sub-squares and each sub-square is dug separately.
- 6) The finds of every dig is washed, dried, labeled and recorded (Figure 7). The depth of each dig needs to be measured. While labeling one should mention the site name (for convenience its abbreviation), trench number, sub-square locus, depth, layer number and date.
- 7) While excavating, the excavator should observe the features of the layers, such as, colour, composition (artifacts as well as others), texture, thickness, compactness, disturbances (e.g. erosion features) in layers if any, its slope, its continuity and its similarities and differences with the neighbouring trenches.

- 8) Man-made features encountered and their nature. These may be structures such as houses, administrative centres, places of worship, workshops, fortification, drains, gates, hearths, kilns, graves, pits, dumps etc. Note their sealing layer, the layers through which they pass and the layer on which they rest. One should always make it a point to preserve the working floor of a structure till they are recorded through drawings and photography.
- 9) Record the details of the archaeological assemblage collected. The three dimensional measurement of the important antiquities may be taken with reference to the northwestern peg (reference peg) before they are displaced from their original context. It is also important to note their relations with its immediate surroundings (e.g. structures or features if any). The note on important antiquities should include their sketches and/or photographs.
- 10) Drawing showing the positions of trenches, plans and sections of trenches, the materials lying in the structures, streets etc.
- 11) Register the antiquities in the antiquity register. All possible information on the antiquity should be given while registering.
- 12) Once a trench is excavated, the excavator needs to relate it with the surrounding trenches and verify if they provide similar or different information.
- 13) Once the marking of the layers is confirmed the materials kept in pottery yard, bone yard, shell yard etc., need to be packed according to the layers. Before doing this exercise, the materials need to be selected using parameters such as their diagnostic and decorative features. If one is not collecting the non-diagnostics, their categories and quantities must be noted before they are discarded.
- 14) Write the most probable interpretation of the excavation by incorporating all the aforesaid factors and verify whether one is able to resolve the problems or raise new problems.
- 15) The final report submitted by the excavator (trench supervisor) should be well illustrated with drawings (eg. contour of the site, site plan, sections of the trenches, plan of structures, artifacts) and photographs of the important features. An analytical note towards the end of the descriptive note is necessary and this will form the tentative conclusions and highlight the various activities of the past communities.

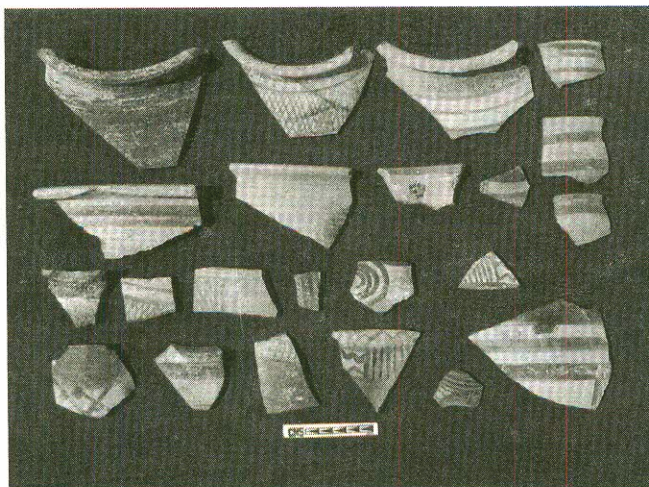


Fig. 7: Photograph of excavated pottery after cleaning

Courtesy: Department of Archaeology and Ancient History, The Maharaja Sayajirao University of Baroda

An example of recording during excavation

TRENCH NO:											
SUB SQUARE NAME	D A T E	DEPTH PER DIG	COLOUR & COMPOSITION OF SOIL WITH APPROX. FREQUENCY OF MATERIALS	SPECIMEN COLLECTED	STRUCTURES IF ANY	OBSERVATION ON THE SECTION AFTER TRIMMING AND FLOOR AFTER LEVELING AND BRUSHING	L A Y E R N O	KIND OF CERAMICS WITH THEIR FREQUENCY (ROUGH)	BONES, SHELLS, LITHIC, DEBITAGE ETC., WITH ROUGH FREQUENCY	TYPES OF ANTIQUITY WITH ROUGH FREQUENCY	R E M A R K S

An example of documentation chart

DOCUMENTATION OF POTTERY		
DATE		
SITE		
TRENCH		
LOCUS/QUADRANT		
DIG/LAYER		
DEPTH		
WARES	?	
	?	
	?	
TOTAL NO OF SHERDS		
TOTAL WEIGHT		
INDIVIDUAL WEIGHT OF EACH WARE		
DESCRIPTION OF EACH WARE	RIM? BODY? BASE? DECORATED SHERD? DECORATIONS VISIBLE? EXTERNAL TREATMENT? BIO-TURBATION MARKS?	DRAWINGS PHOTOGRAPHS
QUANTITATIVE ANALYSIS		

Documentation of artifacts	
DATE	
SITE	
TRENCH	
LOCUS/ QUADRANT	
ARTEFACT	
MATERIAL	
DEPTH	
MEASUREMENTS (Length, breadth and thickness)	
DRAWINGS AND PHOTOGRAPHS	

4.4 CLASSIFICATION

Classification is primarily the ordering of archaeological data into various groups or classes based on a set of parameters. It begins by looking at the similarities and differences between various data or objects. Similar ones are grouped under one category, while different ones are kept separately. The parameters chosen for classification can vary depending on the kind of objects. The most common classifications are typo-technological. For instance, if one pursues classification of stone tools, one might incorporate the nature of flaking, the shape of tool, the degree of retouching and the identity of the raw material. This gives rise to classificatory groups such as, varieties of flakes, hand axes, cleavers, scrapers, blades, burins, arrow heads, anvils etc. in case of ceramics, the vessel form, its colour, nature of surface treatment, externally visible texture, degree of firing, firing conditions, nature of decorations (incised, paintings, appliqué, stamping etc) are taken into consideration. While classifying beads its shape, material and decoration are taken into consideration. The variety in antiquity is innumerable; therefore it is not easy to list out everything, as some types are likely to be missed out. Therefore, in classification any visible feature which can be considered as a property of the object can be taken into consideration.

4.5 ARCHAEOOMETRY

Archaeometry is a term which was/is used to refer to several branches of scientific knowledge that are incorporated under the broad heading of archaeological sciences. In brief, it includes the methods from physical sciences that are useful for analysing archaeological materials, dating techniques, study of technology and provenance of ancient materials, compositional analyses, remote sensing etc. Of this, the most important is dating techniques. Archaeologists employ a range of dating techniques to establish the cultural chronology of any site. These can be broadly classified into relative methods and chronometric methods. Stratigraphic dating, dating of bones through its chemical composition, dendrochronology, obsidian hydration method and varve

sequencing are some of the relative methods. Radio carbon method, thermoluminescence method, potassium argon method are some other common dating methods that come under chronometric dating. A series of wet chemical analyses, spectroscopic studies and different microscopic analyses are employed by archaeologists to study provenance and technique of production of artifacts. Most of these analyses are post-excavation analyses.

4.6 SUMMARY

The overall exercise of archaeological field work consists of systematic recovery of archaeological materials (artifacts/structures/features), analysing them and interpreting them. Archaeologists also try to understand the ecosystem around a site or in a region to understand how the ancient community interacted with its immediate and regional environment. Any kind of archaeological work is inter-disciplinary in nature as the remains of the past are a product of cultural and natural activity. Therefore, archaeology takes help from almost all branches of knowledge to understand the cultural development of humans. Through exploration and excavation archaeologists try to bring out the cultural sequence/chronology of a site or a region or a culture or a civilization. This unit enables a student to understand the various techniques adopted by archaeologists in recovering archaeological remains, its processing and also throws some light into its analysis. It is also important to note that the archaeologists also have the responsibility to conserve and preserve the cultural heritage of the past.

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Sample Questions

- 1) What are the techniques used in archaeological explorations?
- 2) What are the different methods of excavation?
- 3) What are the approaches followed in artifact classification?
- 4) What is the significance of modern scientific techniques in archaeological operations?
- 5) What are the limitations of archaeological interpretations?

NOTES

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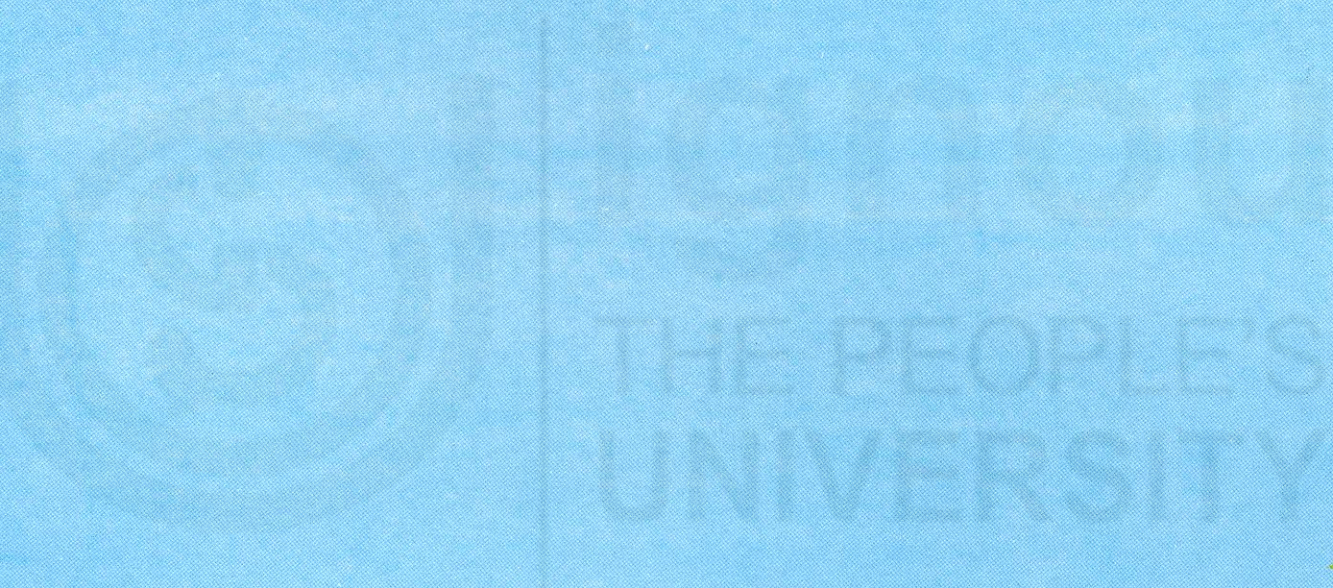
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