Excavation and Documentation Methods – some Problems and Possibilities with Examples from Norwegian sites

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Introduction

This paper describes the methods of excavation and documentation applied on rescue projects in Western Norway. Advantages and possibilities of the methodology are discussed, along with some points relating to problems or shortcomings. Some points concerning possibilities and problems we are faced with when trying to reach scientific goals are also briefly focused on.

Background

The term "rescue projects" or "salvage projects" can in short be said to apply to archaeological surveys and excavations prior to building projects. The excavations are characterized by limited time available, as developers often want to enter the development area quickly. Funding for the projects is provided by developer. The funding is most often quite sufficient for covering excavation expenses and a short report, but is not meant to cover research expenses. In this way funding may be said to be a restricted resource as well. Due to the limitations, field and documentation methods must be rational and efficient, but also prove sufficient for achieving the different scientific goals. We try to minimize the negative effects of the limitations and at the same time to maximize the results through improving our methods and being very clear in formulating scientific goals. In the following, this will be elaborated. It will be shown how these conditions are handled in practice on rescue projects organized through Bergen Museum.

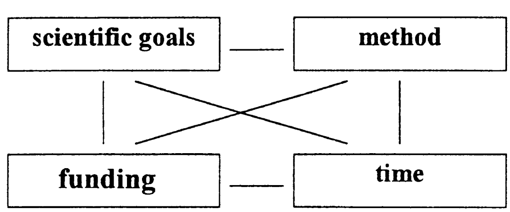


Fig. 1. Preconditions. Rescue projects along with most other projects are characterized by different limiting factors such as time available and funding for the investigation and for research. Due to these limitations, field and documentation methods must be rational and efficient, but also prove sufficient for reaching scientific goals

Since the passing of the first Cultural Heritage Act in 1906, Norway has seen a considerable development in industries such as metallurgy, hydroelectric power development and oil production as well as large road projects. The developments generally involved construction activity. As a rule, known monuments and sites were protected and respected in the planning, but by as late as 1955 the question of the yet unknown sites had not properly been addressed. In the mid-1950's, scholars at the University of Oslo initiated co-operation with the national hydroelectric company as plans were ready for the damming of river and watersystems in the highlands, among them the Hardangervidda highland plateau in the central part of southern Norway. The following project has been known as the "Hardangervidda project". The investigations started in 1958, and including several hundred sites from all periods from the Mesolithic onwards spread over an area of about 7000 km^2. The "Hardangervidda project" has worked much as a pilot-project in Southern Norway. Different experiences with the mountain landscape and the gradual refinement and development of field methodology and techniques for surveying, excavation and documentation were particularly useful as new projects came about, and the need for efficiency was even higher.

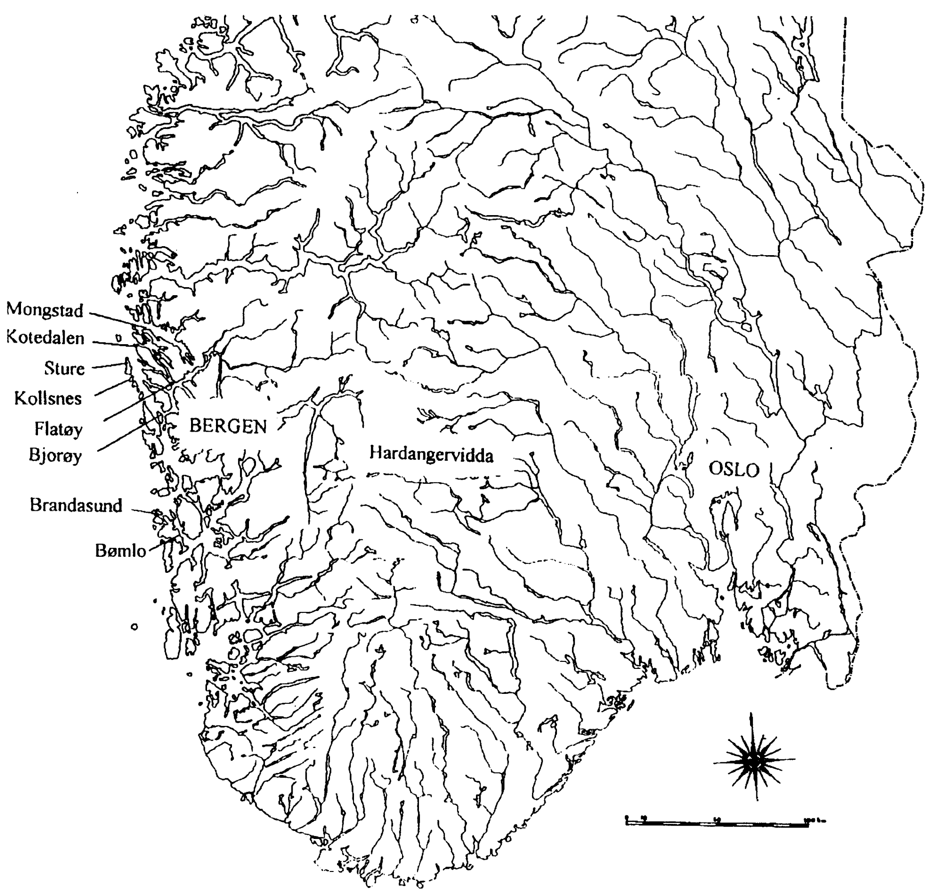


Fig. 2. Map of Southern Norway with place names mentioned in the text

Hydroelectric development projects, as mentioned, exploded in the 1950's and -60's. The petroleum industry took over from the mid-1970's through the 1980's into the 1990's. The industry primarily affected Western and South-western Norway in the beginning, but has later expanded north of 62 degree latitude. Very large investigations were undertaken by the Bergen Museum as a consequence of this. Oil refineries i.e. at Mongstad, Sture and Kollsnes in Hordaland resulted in large archaeological rescue projects. The projects investigated a variety of site types; settlement sites, grave mounds, rock art sites, quarries and so on. The excavated material on each of the projects could include as many as 100 000 artifacts or more, with as many as 50 or 100 separate sites. Thus, archaeologically the projects were large. However, the total time for each project to run was short. They were often scheduled to last no more than 3-5 years including 2 or 3 field seasons. This is very demanding and challenging on methodology.

Methods of field investigations; excavation and documentation

Field investigations on most archaeological projects in Norway are processes that have come to comprise three steps; surveying, preliminary investigation and excavation followed by a short period for work with the report. Each of the three steps of the field investigation will be addressed successively in the following.

Surveying

The results from the surveying phase will enable the developer to evaluate the extent of the archaeological fieldwork. According to the Cultural Heritage Act, the developer is responsible for financing the archaeological investigations, and thus is interested in the results from this phase. The results will be used in deciding whether to proceed with the development plans. Depending on the results, they may want to go ahead as planned, alter parts, or stop the development altogether. Thus, quick and thorough surveying is important to the developer. To the archaeologist, the results are used to estimate the amount of work a project might constitute, and to set up a reasonable budget for the further work both with regards to money and time needed. Both are of importance to the developer. Preliminary investigations and excavations are undertaken after the budget has been accepted by developer, and the go-ahead signal is given.

Surveying is done by surface sampling and test pitting. A combination of systematic and strategic test pits is preferred. The systematic test pits are laid out in a systematic fashion in the selected area, while the strategic pits are placed in the location that look most promising to the surveyor. Both methods are based on selection rather than random sampling of the area. As both the mountain areas and the coastal zones of western Norway are comprised mostly of rock and little soil, they are not suited for random sampling, as the premise of random distribution of sites is unreasonable in these areas. However, surveying thus becomes extensive as every possible area is tested. The job is both time-consuming and labor-demanding. Much work has been put into finding a good method of selecting the right spot for test pitting. Scholars such as Bergsvik and

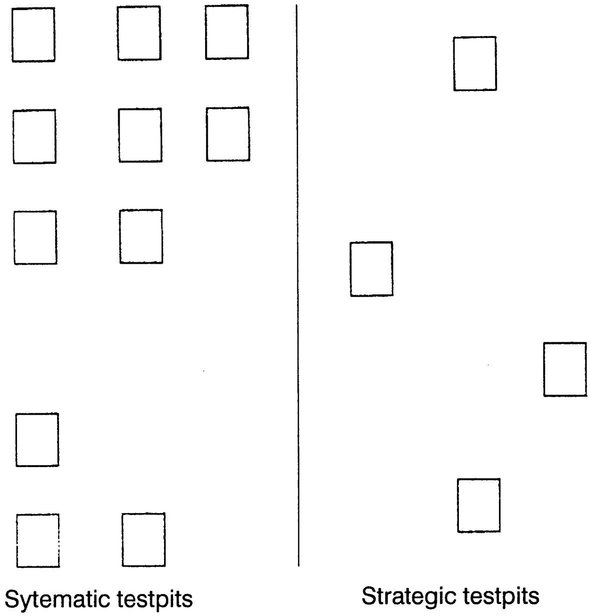


Fig. 3. Two methods for test pitting that are most commonly applied. The systematic test pits are laid out in a systematic fashion in the selected area, while the strategic pits are placed in the locations that look most promising to the surveyor

Bjerck have worked systematically with the problem of localizing sites. A series of parameters are pointed out that may prove important to settlement patterns (Bergsvik 1991, Bjerck 1989). In addition to flat, well drained, surfaces, a good harbor, proximity to freshwater and other resources, shelter from excessive winds and view of the sea are evaluated when surveying.

A most important aspect of surveying is to systematically record negative test pits along with the positive (Bjerck 1989). With this information, one is in a better position to free an area for development. Also, one's possibilities to write prehistoric culture history are much more qualified and the data can be used with greater certainty in regional studies (Bjørgo 1988).

However, surface sampling and test pitting are not always the best method for localizing sites. We became aware of a problem of under-representation of sites from Bronze and Iron Ages especially in outer coastal areas but also in the fjords. Sites from these periods are found on mountain plateau because the vegetation here is very sparse and the soil is shallow, so sites are easily identified on the surface. This is not possible on the coast as the vegetation here is comprised of shrubs and the turf is often very thick. Along the fjords, the habitable areas are cultivated today and the sites are thus hidden. Bronze or Iron Age farm sites often have few finds compared to a Stone Age site so in a test pit they will just look like a little lense of charcoal or a gathering of stones. Such sites, however, are comprised of many different features like postholes and walls, cultivated fields, fences, hearths, burials and so on. These are rarely recognized as such in testpits or even in trenches. This is why uncovering of very large areas in plan with a backhoe, also called "horizontal stripping", has been adapted from the continent and Denmark to Western Norway in the last 5 years (Løken, Pilø & Hemdorff 1996). Results from this method have been very good, and have contributed new knowledge about farmers and farms from the more recent prehistoric periods in our region.

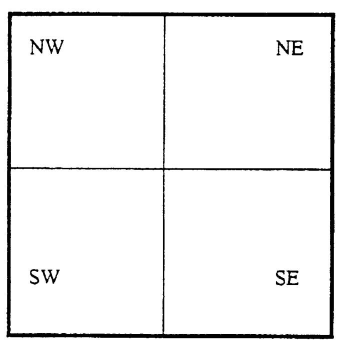
In concluding the section on surveying, the importance of constantly evaluating and reevaluating methods must be underlined. The best way to improve one's surveying methods are by initiating a general discussion of methodology which should include constructive critique and alternative suggestions. Through a critical view, shortcomings and mistakes may be identified. Suggestions to corrections may thus be made and new methods worked out and applied.

Preliminary investigations and excavation

The goals of preliminary investigations are to verify or clarify the information of the survey or add new knowledge of the site. This information is used to evaluate the amount of work needed and thus the time and money needed spent on the site. The methods applied in this phase are much the same as in the surveying and in the excavation phase. However, the preliminary investigations are all the more important as it is here that the strategies of the further investigations are determined. These decisions are of great importance to the research potential of the site.

The coastal areas of Western Norway are often greatly dominated by Stone Age sites. These produce a lot of finds, and most of the investigations had 2 or 3 summers to work in the field before the area had to be cleared for the arrival of developers. In other words time is short and finds are many. In some cases, funding is also limited. The facilities offered by computers are thus heavily relied upon. Information from all phases of a field investigations are usually put into the same database. As computer databases demand uniformity of data to be useful, the methods of excavation and documentation must be closely linked from the beginning to build a homogenous database. The computer database will to some extent reflect the actual field method, but can only be of full use together with additional documentation, such as field drawings, notes or special documentation forms. In the following, examples of how uniformity is achieved between excavation and documentation of three different kinds of sites are shown.

Unstratified stone age settlement sites are the dominating site type found by rescue projects on the coast of Western Norway today. Such a site will be divided into 1 by 1 m squares and again into 50 by 50 cm quadrants, and excavated in 5 cm mechanical layers (Fig.4). The unstratified sites will be excavated as stratigraphic layer A and mechanical level 1, 2, 3, 4 etc. (Fig.5). Thus, a 50x50x5 cm block is the basic excavation unit. All soil from this unit will be sieved on a 4 mm sieve and material collected in the same bag. This may seem like a very coarse resolution, but different mechanisms have affected the primary depositions so much that this will in most cases suffice though exceptions are known. Along with detailed information about finds, coordinates, quadrant and mechanical layer will be entered into the database at a site like this.



43 x 109 y

Fig. 4. Some sites, particularly unstratified Stone Age sites will be divided into 1 by 1 m squares and again into 50 by 50 cm quadrants, and excavated in 5 cm mechanical layers

A stratified site is more complex. Figure 6 shows how the method of excavating stratigraphic and mechanical layers may be used in combination, the dotted lines being the mechanical

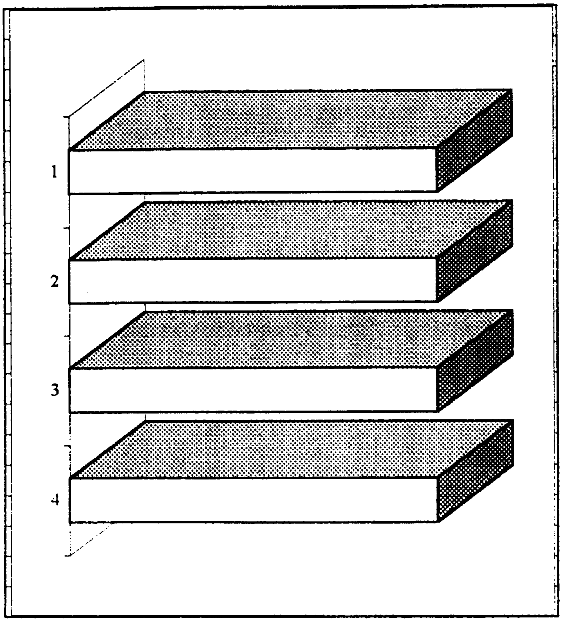


Fig. 5. Mechanical layers. The unstratified sites will be excavated as stratigraphic layer A and mechanical level 1, 2, 3, 4 etc.

layers and the continuous lines being stratigraphic. Layer A are here excavated in 2 mechanical levels, layer B in 3 mechanical levels, and layer C in 2 mechanical levels. The central entries in the database for these kinds of sites are coordinates, stratigraphic and mechanical layer.

On sites where ruins or other features are visible like Bronze or Iron Age settlement sites or burial mounds, the method will again be somewhat different as illustrated with a hearth on Fig.6. The hearth is excavated in two mechanical levels separate from the surrounding layers. The feature is given a separate number, the layer inside the feature is given a separate letter and the two mechanical layers are numbered 1 and 2. When excavating features like this, 1 by 1 m squares are rarely used, rather the excavated units will relate to the feature itself.

An example of this method can be a burial mound (Fig.7). The mound will be divided into four equal parts, two opposite parts may be excavated simultaneously leaving a profile for stratigraphic interpretation. If needed or if

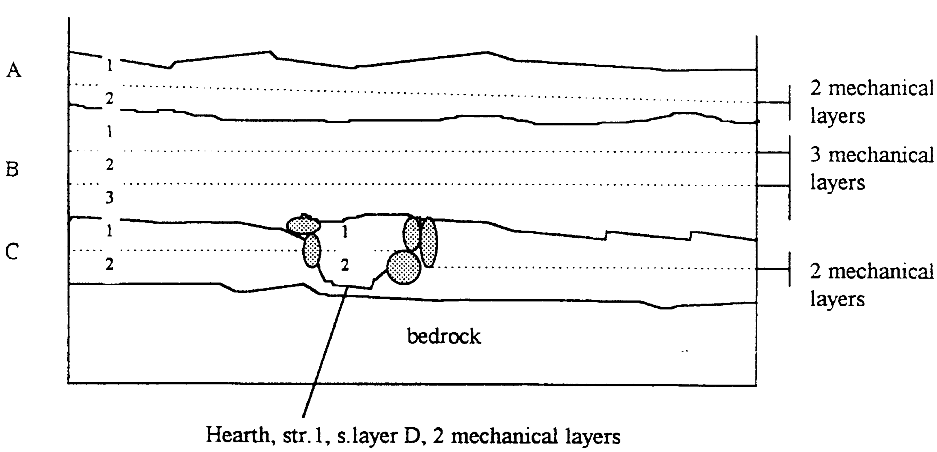


Fig. 6. Combination of stratigraphic and mechanical methods

time and money allows, the two remaining parts are excavated. The burials inside the mound will be given separate numbers and excavated as separate features as illustrated with the hearth on Fig.6.

A house ruin will be excavated much the same way (Fig.8). Two crossing profiles will divide the feature into four parts. Each quadrant are excavated separately. Features inside the ruin are given separate numbers and excavated separately with its own layer name and in as many mechanical levels as needed.

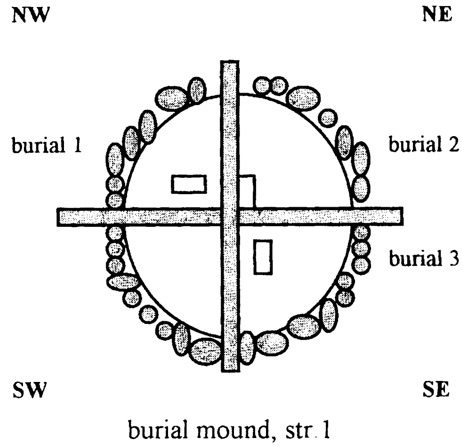


Fig. 7. Excavations of burial mounds

In the computer database the main entries in both the case of the mound and the ruin will be structure number, quadrant and layer; both stratigraphic and mechanical.

Figure 9 shows a page in a database. It is read horizontally. Each horizontal row, is unique and important as such. It tells the story of one unique find in one particular place associated with a particular feature at a given site. Each find in the database will get its own unique number along with a description of artifact type and raw material. The X and Y-values refers to the two-dimensional grid-system laid out over the site. The quadrant-value refers to the 50x50 cm resolution within the square or to one of the four segments in a mound or ruin. Layers are stratigraphic or mechanical or both. At last, on Fig.9 we find the columns feature and comments. With the exception of "comments", all this information is written on the find-bag in the field, and from there it is written into the database.

With a database like this it is very easy to compose a three dimensional picture of the find constellations at the site (Fig.10). Thus, there is no need for making such drawings in the field. Only in special cases is this done at our sites. Also, the excavation method of leaving finds standing on pedestals as the surrounding layers are excavated, is rarely done in Norway. However,

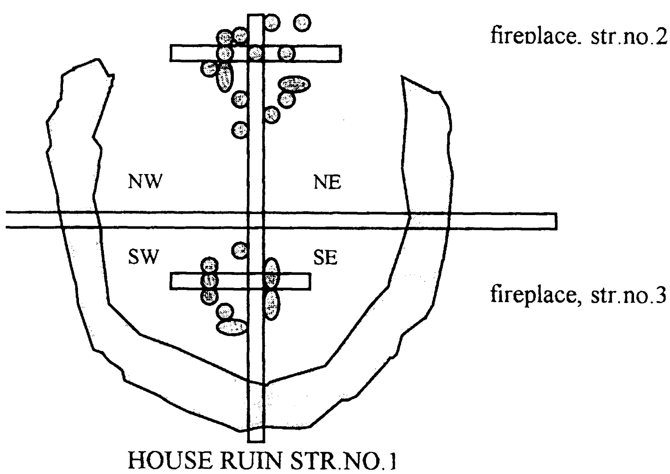


Fig. 8. Excavations of a house ruin

NO	TYPE	MAT	AMOUNT	X	Y	QUAD	SLAYER	MLAYER	FEATURE	COMMENTS
1	BLADE	FL	1	42	99	NW	G	1	1	HEARTH
2	BLADE	KV	1	42	99	NW	G	1	1	HEARTH
3	FLAKE	FL	2			SW	C	1	3	MOUND
4	AXE	JA	1			NW	C	2	3	MOUND
5	BLADE	BK	1			NE	C	2	3	MOUND
6	CORE	FL	1			NE	C	2	3	MOUND
7	MICROFLAKE	FL	1			SE	C	2	3	MOUND
8	FLAKE	KS	1			SW	C	3	3	MOUND
9	FLAKE	FL	1	43	98	NE	B	1	4	POSTHOLE
10	ARROWHEAD	FL	1	43	98	NE	B	2	4	POSTHOLE
11	MICROBLADE	BK	1	43	98	NE	B	3	4	POSTHOLE
12	BLADE	BK	1	45	98	NW	H	3	5	PIT
13	ARROŽHEAD	FL	1	45	98	N	H	3	5	PIT
14	KNAPPING STONE	BA	1	45	98	NW	h	3	5	PIT
15	MICROBLADE	BK	1	43	99	NW	A	1		?
16	BLADE	JA	1	43	99	SW	A	1		
17	ARROWHEAD	FL	1	47	98	NE	A	1		
18	BLADE	JA	1	43	100	NE	A	2		

Fig. 9. Printout from a database

we can reconstruct these distributions on the computer. Figure 10 is made on the computer and shows where axes were found at one particular site. The information is taken from a database were each axe is entered with coordinates, layer number and artifact type.

The resolution of the grid system and also the thickness of the excavated layers can be adjusted finer or more coarsely. So at sites were the post-depositional effects are small, a more fine-grained system may be desired while at sites were the post-depositional effects are large, an even coarser system may suffice.

The computer program is made to recognise complete likeness. If there is a slight difference, a comma is enough, then the data is seen as different. Referring to Fig.10, you can not call this an "axe" in one place and in another place call it a "small axe" if you want them counted as being of the same kind. This call for uniformity may cause practical problems. Misspelling may occur, although that is easily corrected with the available programs. A more serious problem occurs if the excavation methods or the system of cataloguing are such that the entered data are ambiguous like the example with the axe mentioned above, or if coordinates are given in different ways and so on. For the best results this must be corrected. Planning of excavation and documentation methods prior to fieldwork are thus essential.

Research goal

All rescue projects have their own formulated research goals. These may be of an overall or a more specialized nature. The specialized goals may relate to the artifact itself concerning things like style or raw material used, distribution of artifacts or site types in the area or time-period aso. The more overall research goal may relate to aspects of chronological or typological development of artifacts or site types between regions or countries, experimental methodology, demographic or gender relations in regions or time periods and so on.

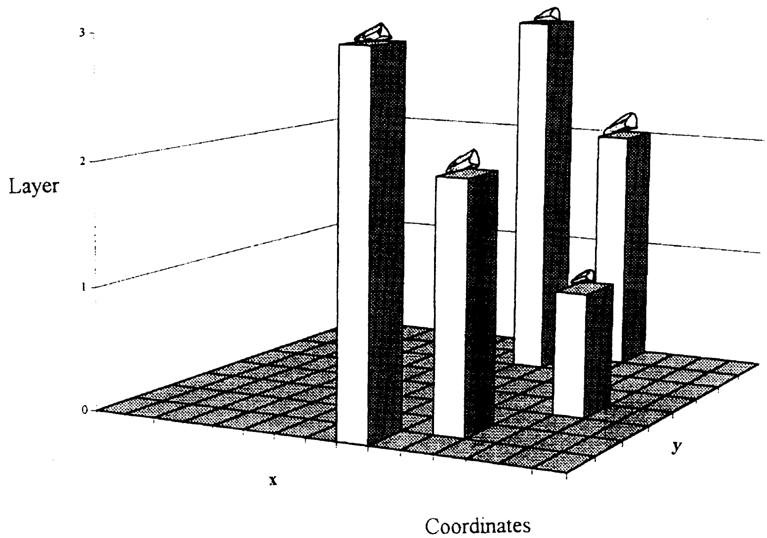


Fig. 10. Distribution of axes in a Stone Age site as plotted directly from a database. The excavation method of leaving finds standing on pedestals as the surrounding layers are excavated, is rarely done in Norway. However, we can reconstruct these pictures on the computer. This figure is made on the computer and shows where axes were found at one particular site, two axes in the top layer, two in layer 2 and one in the bottom layer. The information is taken from a database where each axe is entered with coordinates, layer number and artifact type.

It is an oversimplification to state that the primary concern of rescue projects comprise collecting data for later research. However, the above presentation should be sufficient to illustrate the restricted possibility for academic elaboration within the rescue project. Also, economic funding for research is not granted by the developer and must be sought elsewhere. As a result of this, the more general analysis of overall nature are left out and more specialized goals are chosen on rescue projects. These may be made less time-consuming and also more directly related to the field activities.

A serious dilemma thus becomes evident; evaluation of how to ensure maximum research potential of the data, must be central throughout the project period for there to be any meaning in going through with the project as an academic task. However, such evaluations must be made on the basis of previous results, and then primarily results of analytic nature. The problem is that there is little room for more general analysis on rescue projects. It has thus been of some concern in Norway that rescue projects are in danger of becoming mechanical rescue operations, collecting artifacts and documenting sites without academic perspectives.

As a consequence of this, and in conclusion, it must be pointed out that methods of investigation on rescue projects have implications for the research potential of the data and thus for the results of later research projects. In this way, rescue projects may be said to play a key role in research strategies on several levels. The importance of close connections between different research milieus and the rescue projects can thus not be overstated. An open dialectic relationship is of mutual interest and of invaluable importance to both.

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Kasinėjimų ir dokumentavimo metodai – problemos ir galimybės remiantis Norvegijos paminklų pavyzdžiais

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Santrauka

Šiame darbe aprašomi kasinėjimų ir dokumentavimo metodai, taikomi paminklų konservavimo projektuose Vakarų Norvegijoje. Aptariami metodų privalumai ir galimybės, o taip pat kai kurie trūkumai ir problemos. Trumpai aptariami klausimai, susiję su galimybėmis ir problemomis, kylančiomis siekiant mokslinių tikslų.

Terminas „gelbėjimo projektas" ar „išsaugojimo projektas" taikomas archeologinio žvalgymo ir kasinėjimo darbams, kurie vykdomi prieš užstatant tam tikras teritorijas. Tokiems kasinėjimams paprastai skiriama mažai laiko, nes statybinės organizacijos nori kuo greičiau įsisavinti teritoriją. „Gelbėjimo projektams" pinigus skiria įsisavintojai. Tų pinigų užtenka atlikti kasinėjimo darbus ir parašyti trumpą ataskaitą. Taigi, tokį finansavimą galime vadinti ribotu. Todėl lauko darbų ir dokumentavimo metodai turi būti racionalūs ir efektyvūs, t.y. pakankami, kad leistų pasiekti tam tikrus mokslinius tikslus. Mes dedame pastangas minimalizuoti neigiamas finansinių apribojimų pasekmes ir maksimalizuoti gautus rezultatus tobulindami darbo metodus ir labai aiškiai apibrėždami mokslinius tikslus. Žemiau papasakosime, kaip šitos sąlygos yra įgyvendinamos vykdant „gelbėjimo projektus", kuriuos organizuoja Bergeno muziejus.

Daugumos Norvegijos archeologinių projektų lauko darbai vykdomi trimis pakopomis: žvalgymas, preliminariniai tyrimai ir kasinėjimai, po kurių seka trumpas ataskaitos ruošimo laikotarpis.

Žvalgant labai svarbu pastoviai vertinti ir tikrinti taikomus metodus. Geriausias būdas tobulinti žvalgymo metodus yra organizuoti metodologinius pasitarimus, kuriuose būtų girdėti konstruktyvi kritika ir alternatyvūs pasiūlymai. Būtent kritiškas požiūris leidžia išvengti trūkumų ir klaidų. Taigi, galima siūlyti pataisas ir naujus metodus.

Preliminarių tyrimų tikslas yra patikrinti ir aiškinti žvalgymo metu gautą informaciją ir papildyti turimas žinias apie paminklą. Tokia informacija reikalinga nustatant darbų apimtį, laiką ir reikalingą pinigų kiekį. Šioje pakopoje taikomi metodai yra maždaug tie patys kaip ir žvalgymo bei kasinėjimo pakopose. Tačiau preliminarūs tyrimai svarbūs tuo, kad jų metu nustatoma tolimesnių mokslinių tyrimų strategija. Nuo padarytų sprendimų priklauso visas konkretaus paminklo mokslinių tyrimų potencialas.

Baigiant galima būtų dar kartą pabrėžti, kad „gelbėjimo projekte" taikomi tyrimų metodai ir tolimesnių mokslinių tyrimų rezultatams. Kitaip sakant „gelbėjimo projektas" vaidina esminį vaidmenį įvairiuose mokslinio tiriamojo darbo lygiuose. Sunku pervertinti ryšius tarp „gelbėjimo projekto" ir įvairių kitų mokslinio tyrimo sričių. Šis dialektinis ryšys yra neįkainojamai svarbus.

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