CRITERIA OF EFFECTIVENESS OF ARCHAEOLOGICAL FIELD RESEARCH WORKS IN THE LIGHT OF SETTLEMENT ANALYSIS

The aim of the following considerations will be an attempt at finding an answer to the question: what field research works are most effective in settlement analysis and provide most valuable information at the present state of development in problems of recognition and by contemporary means of investigation. Such a step requires discussing the following problems at least in a general way:

(1) the function of settlement analysis in the cognitive process of archaeology and prehistory, and criteria to estimate the degree of effectiveness in field research works for its realization;
(2) the most essential tasks to the further development of our disciplines and therefrom resulting information needs concerning settlement analysis;
(3) the present possibilities of satisfying those needs by field research works. The mentioned points will be discussed as briefly as possible.

Ad (1) the functions of settlement analysis in the process of archaeology and prehistory are presented in the enclosed diagram, showing the main stages of recognition and their most important connections¹ (fig. 1). It illustrates principally the course of cognitive activities in all sciences studying complex systems,² with a big number of variables, in conditions of incomplete observation.³ Much simplifying, but distinguishing the successive phases of research, as well as their interdependence in the whole process of research, it brings out the essential role of the stage at which entities are established,⁴ including also settlement analysis. Combining the knowledge of the subject, acquired so far, with newly gathered observations, that are the condition of the whole research process, is very important at this stage of research. For it is indeed the stage of connecting earlier research activities — observation and analysis — with later ones that are to explain the synthesizing proposition about the studied reality. Earlier phases consist in collecting and classifying observable indexes proving the occurrence of facts — later ones will seek logically grounded statements evidencing the structures of systems and their dynamics.

The foremost task of the mentioned stage is therefore: transforming in-
Fig. 1. Simplified diagram of a research process in archaeology and prehistory, presenting the main channels of information.

formation ranged till now subjectively, according to usual observation and classification techniques, into an objectively ordered set of indexes, characteristic of the actually investigated systems. The principle of syndromatic character of indexes in the set, therefore of their joint indicating the occurrence of an event, is the result of the so far obtained knowledge on a subject. Transforming information makes it possible to construct a first picture of the studied systems and their mutual relations on the basis of hypotheses. Thus appears in the investigator's mind the first version of
a construction, which in the further course of research ought to approach a state of homomorphism with the object studied. Its appearance is the condition of fulfilling in turn two most essential functions of the phase of stating facts, which in the entire research process lead to a more exact recognition of the studied object, as well as to the verification of the so far applied research process. One of them consists in an initial confrontation of research hypotheses with the results obtained by observation and analysis. Placing both those types of investigation on one plane of the outlined picture of facts, renders their mutual verification possible. Let us stress that this is a creative kind of verification, leading to an enrichment of both elements of cognition and to the appearance of new conceptions and new observations. Extreme cases may bring about either a complete rejection of a hypothesis and substituting it by a new one, or the marking out of a supplementary course of observation. The enclosed diagram represents the acting of this function as a direct feedback between stating facts and drawing their synthesis — and the unilateral influence of the stage of stating facts on the collecting of observations. The second function is closely connected with the first and completes it. It consists in finding the situation of investigated systems in the frame of a larger system and in the range of a wider recognized reality, as they have most often a double aspect: a static and a dynamic one; they should therefore be given a place in the structure and made visible in the process of changes; this is particularly important by investigating complex systems. Cybernetics presents them as a many-storey whole composed of subsystems, each one of a higher grade, comprising in turn a growing number of subsystems of lower grade. Between them occur qualitative differences. For the acting of a higher grade system depends not only on the way of acting of lower grade systems composing the former, but also on its structure, or on the way in which lower systems are interconnected. A system of that kind should not be investigated by conceiving all acquired observations on one comparative plane, which is right for the study of a simple system, be it even composed of many elements. Establishing a proper hierarchy of the studied systems in the frame of a larger whole, ranging their observable elements into systems of proper levels, will assure the correctness of further research. Both mentioned functions can be realized only by a possibly large comparison of the model of facts with the investigated object and its surrounding, taking thus into account their mutual relations, their relation to the environment and — above all — their static and dynamic proportions. In other words, models of systems formed in the investigator’s mind should be adjusted to the true situation, until it becomes obvious that their structure and their relation to the environment correspond in an isomorphic respect to the recognized situation sufficiently for continuing further phases of the research process.

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The stage of establishing facts, characterized here generally, assumes naturally different particular forms, depending on the kind of object, as well as on the aim and manner of research. A medical examination will comprise an interview with the patient and establish an initial diagnosis, after taking account of some specific analyses. A legal inquest will compare the results of an introductory investigation with the human environment in which the offense had been committed. In archaeological and prehistorical research, also in socio-historical and geographic disciplines, where natural forces and human activity mutually influence each other, facts will often be established by the help of settlement analysis. Such a process will make use of the results of earlier archaeological phases of research and the data provided by other historical disciplines, and will avail itself of the information that natural sciences have gathered about the environment, concerning settlement analysis. The manner of transforming information into a set of indexes is always suggested by the actual aim of research and the so far possessed investigator's knowledge will show him the exact way of achieving it. This is an essential matter to be well remembered, as overlooking it has often led to treating investigation on settlement from one or another period as the only objective of research, which would be pure nonsense from a methodical point of view. Similarly as observation is worthless if its aim is not at least generally outlined, neither can settlement analysis be carried out effectively without adjusting it to the definite problem it has to solve. A bad misunderstanding would also be putting an end to the process of research by the analysis of settlement, which is indeed only the beginning of proper investigation. While reviewing papers on settlement it is easy to notice how often their authors subordinate settlement analysis to objects of their personal interests, not being even aware of it, but obviously reducing thereby the value of its results. Exposing single indexes adjusted to the aim of a given analysis, has nothing in common with their free selection and the rejection of others. Making use of random gathered heaps of information would impede the fulfillment of the two above described main functions of settlement analysis, consisting in a verification of the models of facts placed in time and space, and in stating their place in a larger system. Exposing the information more necessary in the given investigation, we keep sight of others, left — so to say — in the background, ready to retrieve in case of need. Therefore, the set of natural history information, indispensable to the knowledge of man's exploiting the natural environment, or to the determination of primitive economy, is less useful when studying social changes in settlement groups or distinguishing regions of culture. The characteristic of a determined environment should, however, always be respected. Moreover, settlement analysis concerning a certain region of prehistory, requires the knowledge
of alterations that had occurred in a longer run, taking also into account the periods directly preceding and closely following the time subjected to analysis. The latter should necessarily comprise the whole of a settlement complex, considering also the situation in neighbouring territories.

The listed requirements jointly help to provide a sufficient amount of observations allowing to build up a set of possibly full and well differentiated information on the investigated facts. Such sets are treated in settlement analysis as systems or representative parts of retrospective systems, therefore such systems in which the outcome is well known and the input quite dark, or the consequence of certain activities are known, but not their causes. The most difficult, but also most fruitful part of settlement analysis is the choice of such prospective systems and assemblies of cultures and natural factors, that would most probably explain the occurrence of retrospective systems on the level of today’s knowledge. Selected models of culture and natural systems are simply forms of working hypotheses adjusted to the level of a comparative settlement analysis, and only in such a developed figure can they be estimated during operation. Therefore, the larger is the amount of outcomes provided by the retrospective system to be disposed of, the easier will be finding a hypothesis able to clear its occurrence, and all the more trustworthy from a methodical point of view.

The mentioned remarks concerning the function of settlement analysis in a research process are sufficient to formulate the criteria of evaluation of the effectiveness of field research work. Such an evaluation would be very simple in the case of works designed to gather only a certain kind of observations necessary to the solution of a single, earlier proposed problem. The acurateness of carrying out required investigations would then tell the degree of their effectiveness. Such an operation would, however, be very difficult, for archaeological field works absorb such a quantity of time and effort, that applying them widely is not admissible. Moreover, it should not be forgotten that all manners of exploration so far applied bring devastation in a greater or lesser degree to all traces of human history hidden in the earth. The advantage of single research aims would be disproportionate to the loss caused by destruction of assemblies of finds that appear now in limited quantities. That is why archaeologists are not free to conform their research to the angle of one determined problem, as do mostly other disciplines, such as physico-chemistry, biology, geography, psychology and sociology, or generally those in which prolonged and repeated observations are no great trouble. The results of archaeological field works are collected pieces of information to be made use of in many cases and various aims of research, so as to balance the mighty cost of the social and cultural effort they require.

This necessity is a permanent source of troubles encountered in almost
every archaeological or prehistorical research process. They may only be solved by a bold progress in techniques “able to construct a camera that would take photos of the inside of the earth,” and so render possible observations of finds without displacing them. It is worth while to notice that techniques are already well on the way of the future realization of such a dream in archaeological exploration. The swift improvement of achieving airphotos or interesting trials of putting certain geophysical prospective methods to the use of field research, should indeed foster our best, however distant, hopes in this matter. The present means of archaeological exploration impose exceptional requirements on investigators conducting field works, expecting their information to be exact and also multidirectional, therefore to accord two disparate tasks. Suiting research process to the solution of a determined problem may occur in a certain measure while an archaeological subject is being elaborated, and it steps out fully in the phase of establishing systems, therefore in settlement analysis. The needs of the latter will most certainly evaluate the general effectiveness of field research works and their usefulness for particular directions of the analysis will be more or less equal to their more general value. The question may be conceived in three criteria concerning the effectiveness of field research works, mutually complementing each other.

The first is quite simple. Field research will be all the more effective if it manages to gather information that can satisfy the largest possible number of settlement analyses, conducted in different research aims. For instance: research providing observations useful to the stating of general alterations concerning exploitation of the environment by man, will bring less effect than investigations indicating not only the first kind of relation, but also giving an idea of settlement structure and its dynamics in a given neighbourhood; still more valuable that the latter will be field works giving, on the basis of exploring cemeteries and settlements, premises to a demographic estimation and a culture characteristic concerning human groups living there in a given period, etc.

Such a quantitative criterion ought to be supplemented by a qualitative one. The degree of effectiveness in every domain of events subjected to the analysis marks out, owing to field works, the highest among all systems, possible to discern by means of the information acquired. The set of indexes, sufficiently representative for the stating of superior dependences, will assure the knowledge of inferior ones, subordinated to the former. So, for instance, thorough archaeological and natural history investigations of one microregion, able to determine the type of economy dominating there in a certain period, will simultaneously assure the acquaintance of all simpler relations, such as: the disposition of dwellings and production centre, the ecological environment exploited by settlers and its approximate
size, the approximate size of a human group living in the microregion, etc.

The effectiveness of research subjected to the mentioned criteria will improve in a general sense the completeness of archaeological exploitation, the increase in number and exactitude of multidirectional observations carried out by archaeologists and other scientists, the widening of space- and-time dimensions concerning the investigated settlement complex.

All these indications do not still sufficiently determine the full value of field research. Its value for actual research problems should be estimated according to the relative criterion of effectiveness. The progress of every empirical science depends not only on the deepening of sets of problems and the improvement of observations, but also on mutual according these two processes in particular stages of development of a given discipline. The usefulness of field research consists in providing information necessary to the solution of problems that seriously contribute to the progress of cognition at a given stage of its development. The effectiveness of Biskupin excavation works, carried out in 1930s was not so much the result of the good keeping of finds at the bottom of the lake, or the scale of investigation, as the result of undertaking them at the right stage of the problem's development which broadened considerably the contemporary horizon of archaeological knowledge. Premature forwarding problems, virtually unsolvable, when using only contemporary means of observation — leads research astray. A pronounced example of the above was undertaking at the turn of the 19th to 20th centuries ethnogenetic problems.\textsuperscript{18} Neither is recommendable an excessive extension of observations, outgrowing actual needs of research, for it leads in turn to impairing efforts and threatens to overlook many essential relations. An evaluation according to a relative criterion of effectiveness is most difficult, requiring the comparison of least measurable elements in the progress of our disciplines, it is, however, most important concerning directly the principal sense of undertaking field research.

I believe that joint application of the three mentioned criteria to the evaluation of archaeological field research works, allow to determine their effectiveness in a fairly objective way.

Ad (2) The second point of this article is an attempt at discussing the most essential present needs of research. The development of every empirical science is known to advance from stating simple dependences to more complex ones, which is connected with an indispensable study of higher systems and giving attention to wider series of events. Only in quite early archaeology did most elementary observations rest upon the comparison of single monuments wrenched out of assemblages. The elaboration of principles of typology prompted the need of analysing small “closed complexes” of monuments, from a more or less equal time. The improvement
of stratigraphic methods, borrowed from geology, brought fully out the importance of analyses, placing traces of man's activity in situ, and respecting the context of their occurrence. Considering the so far recorded activities of archaeology it is easy to notice: a qualitative deepening of this analysis, resulting from the development of research problems, from an improvement of archaeological methods and their increased cooperation with other disciplines, finally from a constant increase of the spatial range of research and lengthening the range of periods subjected to observation. Every step forward in the evolution of archaeology is significant by giving particular attention to always bigger assemblages of finds. That kind of assemblages will provide most valuable information; it will be an observation ground serving to the solution of problems most essential at the moment and ready to elicit new ideas of conceiving knowledge; it is in short an object able to fulfil the conditions of a relative criterion of effectiveness presented above. Such objects were in turn: "closed assemblages" from Montelius's time, represented by hoards and single graves, necessary to the stating of relative chronology, later cemeteries, settlements, hillforts, groups of closely related sites, whose investigations in recent years brought much to the knowledge of the structural development of large early towns, finally full assemblages of finds from one period, discovered in one microregion. All those were at their time not distinct owing to frequent investigation, or to the fact that an exploration of larger assemblages was not attempted, even without drawing full profit from the latter. The mentioned objects were most closely linked with methodical indications, for it soon became clear that the first fully explored assemblages were swiftly gaining the position of model objects of research, that their dimensions began to determine the obliging level of observation and analysis, finally the minimum frames of reference to the functional, spatial and chronological range, in relation to which all observations, even partial investigations, should be situated. So for instance: carrying out large excavation works in some hillforts, determined a certain range of elementary observations on the latter and its nearest surrounding; such observations are made in the case of sounding investigations and allow to make out its preliminary characteristic. Similarly, the results of earliest archaeological and natural history investigations in a microregion, will lead to an easier interpretation of the results of surface research in a similar territory, also marking out new and wider limits to the analysis of phenomena perceived there. The results of an even incomplete archaeological survey are now analysed in the boundaries of a microregion and next to the disclosed sites we take account of unexplored zones, where the remaining part of an interesting settlement network may occur. The above characterized standards of the range of observation find naturally diverse reflection in research practice.
So for instance: next to skilfully accomplished soundings in old hillforts, providing valuable information at the expense of a small effort, we may even now find cases of excavation works in relatively easy grounds, not covered since by new buildings, where, notwithstanding long systematic investigations, no answer has been given to questions concerning their characteristic. The latter certainly evidences the methodical indolence of investigators conducting such an excavation. Switching the attention of archaeologists to ever greater assemblies of finds is certainly touching a sign determined by David Clarke as an activity "similar tacit models and procedures based upon similar and distinctive entities." In the alterations of archaeological research problems we notice a tendency, much like that to be perceived in other empirical disciplines, inclined to grasp the knowledge of an ever higher degree of systems. It is perhaps not so distinct as in other more developed sciences, for instance chemistry, biology, psychology and economics, which can, however, be explained by a still insufficiently formed consistent theory of investigations, making the progress of general trends of research difficult and does not prevent the dispersion of efforts applied to the solution of problems not so important, but more fashionable at the time. Promising changes can, however, recently be noticed in that respect.

The necessity of elaborating methods of analysing materials contributed initially to the widening of the field of observation. At present, the needs of prehistory exert growing influence in this matter. The latter's principal aim is acquiring knowledge of the structure and dynamics of culture systems in most remote ages and determining on their ground the regularities prompting alterations in these systems. An understandable attitude among investigators, whose endeavours have assumed that direction, is the tendency to acquire fullest information about human communities active in particular periods of prehistory, about their environment and the results of their activities. Such needs of research are luckily in accordance with the true research possibilities of archaeology. The words of Gordon Childe, telling the results of man's activity approved and repeated by other members of his community to be the only proper object of observation and archaeological analysis are indeed quite convincing. The principal reference plane and simultaneously the reason of firm contiguity in methodics and solving research problems, used by both these disciplines (archaeology and prehistory) is therefore the human social group and the results of its doings. In archaeological materials the easiest way is distinguishing the remains of various human groups by their localization in time and space. Prehistory is in turn more interested in earlier phases of human civilization, when the localization of settlements in space reflected economic, social and cultural structures and territorial communities were principal
social units at that time. This is a second observed convergence or positive feedback linking archaeology with prehistory, in the phase of stating facts by methods of settlement analysis. The effectiveness of field research is for the latter, depending on the range of space comprised, sufficiently clear from this point of view. Shifting research to a wider spatial range not only opens chances of analysing larger territorial assemblages, but also multiplies the results of lesser investigations, carried out earlier in the same territory, allowing to recognize the activity of smaller human groups in their larger culture context, gaining thus a deeper insight into various domains of the life of then living societies. This will simply mean passing on to the investigation of higher levels of culture, seizing thus qualitative not only quantitative differences.

I have already mentioned that the widest horizon of observation practically accepted so far in field research, are investigations in a microregion.\textsuperscript{17} The necessities and methods of carrying out that type of research have been already outlined.\textsuperscript{18} Speaking most generally, the proposed aim is here acquiring knowledge about a settlement network, limited to a middle-size, physiographically distinct, territorial unit, by combined: surface, sounding and excavation works. Archaeological records are always completed by natural history communications, concerning the local environment and in case of need (particularly when studying early Middle Ages) also by consulting written sources. The surface of thus investigated settlement units is generally from several to over a dozen square kilometers, it seldom reaches 20–30 and should not exceed 40 sq.km. During the last 15 years a number of that kind of investigations have been accomplished in Poland,\textsuperscript{19} and their results have seriously contributed to the progress of our knowledge. Not being able to name here all problems solved owing to information provided in that way, we may only quite generally say that they have managed to furnish a first, very full in archaeological respect, picture of small territorial assemblages, reaching back to the period of primitive communities and early feudal epochs, giving even an outline of the latter's alterations concerning economic and political centres of big social units.

Duly appreciating the effectiveness of research so far carried out by the mentioned means, it can be remarked that its observation horizon, now becoming too narrow for the fast developing research problems in prehistory and field research, demands today a more spacious range, which has already been mentioned in Polish literature.\textsuperscript{20} Witold Hensel\textsuperscript{21} presented many times, beginning with 1958, the absolute necessity of wide-range investigations, giving them the name of "microgeographic" methods. We shall only state that introducing the latter becomes every year more urgent, taking into account the recent results of research. For, while reviewing serious, lately published, synthetic monographs concerning particular pre-
historical periods, it can easily be noticed that: (1) their authors' most essential statements are based on the results of microregional investigations, analysed on the background of a wide, only slightly known area; (2) to nearly all the chief domains of our research have these papers brought problems that cannot be further elaborated without wider investigations of much larger settlements complexes than those so far examined. What range of observation and a recognition of what kind of units is understood by those postulated investigations?

Treating generally and rather simplifying the results of so far accomplished analyses concerning a spatial and chronological disposition of finds, reaching back to the ages between the Neolithic and the first half of the early Middle Ages, three principal orders of size among settlement groups may be noticed. Their territory oscillates, it is true, in rather wide limits; should we, however, take into account the number of elements influencing that differentiation, we shall conclude that we have to deal here with an astounding tendency to the stabilization of settlement structures in similar spatial frames, a tendency that can rather be explained by a similar type of pre-urban civilization dominating then in our lands.

The first and smallest type of groupments has already been the object of the above outlined microregional investigations. It concerns traces of lowest grade territorial societies, represented by one, sometimes two cemeteries and one or more small settlements of the same time, moreover a corresponding handful of finds, uncovered by recent penetration and exploitation of the neighbouring countryside. The human groups that had been living there formed settlement microregions, of an area oscillating in rather wide limits, according to the group size, to the kind of environment, and first of all, to the dominating type of economy. Microregions with distinct physiographic boundaries could have included an area from several to 20 and 30 sq.km. The size of cultivated stretches of land had been probably smaller, amounting in antiquity to perhaps several sq.km. and growing considerably only in the early Middle Ages.

A number of several up to 20 settlement microregions will form the following size of human groupments, conventionally called a settlement mezoregion, covering an area of 100–500 sq.km., most often, however, only from 150–300. Very differentiated and less fertile territories, holding badly dispersed dwellings, included empty spaces and presented therefore larger settlement units. In the opposite case, a territory with rich ecological environment, situated for instance round a deep lake or along a river's valley, used to have dense settlement and such a region may have reached only about 100 sq.km.

A certain number of mezoregions, separated generally by stretches of empty land, formed in turn a unit of third size order, named conventionally
a settlement macroregion. Its total territory largely depends on the disposition of lower grade groupments, exceeding usually an area of 1,000 sq.km (only in the initial phases of macroregions being formed, could they have measured a smaller surface) and in some cases reaching up to 3,000.\(^{24}\)

The forming of the three above outlined types of size concerning settlement regions in older phases of the early Middle Ages, have been thoroughly investigated by Zofia Hilczerówna over the south-western area of Great Poland,\(^{25}\) and recently by Władysław Łosiński in one part of Middle Pomerania.\(^{26}\) Settlement macroregions of that time are understood to have been the areas of so called “small tribes,”\(^{27}\) whereas the two remaining types are characterized by Zofia Podwińska\(^{28}\) in her archaeological and historical elaboration as: small village communities in microregions and larger local communities in mezoregions.

Those divisions are relatively distinct in the late La Tène and Roman influence period. Jerzy Okulicz has discussed them more widely taking the example of the Nidzica basin,\(^{29}\) they are moreover fully confirmed in elaborations speaking of other Polish lands.\(^{30}\) They are generally considered to have been remains of the activity of family groups, neighbours’ communities and small tribes.

The mentioned divisions are remarkable also in the La Tène period in areas covered by the Pomerania culture,\(^{31}\) as well as in territories of Celtic settlement.\(^{32}\) They most probably occur in the area of West Baltic settlement in the early Iron Age,\(^{33}\) distinctly visible as micro- and mezoregions on the maps showing Lusatian culture settlements,\(^{34}\) also to be remarked in the settlement maps of early Bronze Age cultures\(^{35}\) and those of a late Stone Age.\(^{36}\) To make attempts at a reconstruction of main socio-economic systems on the basis of information they provide is a difficult matter, and particularly of early period it cannot be very certain. Particularly the Neolithics and early Bronze Age, differentiated culturally so much, suggest serious doubts and require penetrating analysis. The mentioned divisions to be observed in every period, certainly reflect the activity of social groups of a territorial type, marking thus a time-and-space framework useful to observations and field analysis.

It should therefore be emphasized that the further progress of archaeology and prehistory to be expected in the nearest future, will largely depend on undertaking field research, including whole mezo- and macroregion settlements.\(^{37}\) In any case and at the present stage of development of research problems, only that kind of investigation (viewed from the angle of the needs of settlement analysis) really fulfills the three above outlined criteria of effectiveness. Only combined archaeological and natural history investigations, not limited to a single period of prehistory are here recommended. Otherwise, the research effort aimed at achieving a detailed
survey of a chosen area would hardly be useful. A most certain thing is that only collective, concentrated investigations, conscious of progressing requirements, are able to solve the two mutually opposed tasks of field research: achieving multilateral and ever more exact observations. The time given to exploration can neither be excessively prolonged, for it should be remembered that the present fast development of research problems causes the relative effectiveness of field research to decrease at a similar rate. Intensive exploration ought to be supported by simultaneous laboratory works, analysing the former's results. The concentration of both efforts will be highly repaid. The size of this article does not allow to discuss the multilateral cognitive and methodical advantages obtained by that kind of research enterprise. It would, for the first time provide sound grounds of observation to the analysis of the whole range of activity among primitive societies, for whom the highest social bond was the tribal group, and the majority of socio-economic activities was accomplished within the frames of subtribal family communities and later territorial units. Also our disciplines would for the first time be a fullright partner for natural history disciplines that are now so important, studying alterations in the natural environment and in the changes brought to it by man.  

Ad (3) Before closing this article I wish to consider the present possibilities of meeting the listed needs of research. Polish archaeologists are still not aware of the dimensions of the research potential provided by the years following World War II. The publication Informator Archeologiczny tells us about several hundred excavation works conducted every year in our country, the number of skilled investigators is also steadily growing. The Poznań centre for instance employs at the moment 50 trained archaeologists busy all the year round, which is half more than did all Poland before World War II.

On the other hand, microregional investigations absorb an immeasurable quantity of work and expenditure, well known to every explorer. These elements are inclined to increase proportionally by the investigation of larger settlement units, even while suiting the enterprise to extreme economic standards and limiting full exploration to some microregions and to single objects, indispensable for obtaining the characteristic of the whole assembly. Neither should we forget that research will be sensible only in the case of working hand in hand with natural history scientists, which is moreover bound to increase the effort required and the expense it will entail.

Such are the reasons inducing me to assume that a large-scale operation undertaking the exploration of settlement macroregions would just now be premature. Though being possible to carry out by full concentration of
active forces, it would bring too heavy a balast on the resources of ar-
chaeology and would require putting a stop to all other directions of re-
search. Before improving the techniques of archaeological discernment
(airphotos perfectly suited to our needs) and of general exploration and
particularly the means of elaborating the results of field works, we cannot
risk starting research on such a large scale. This does not mean giving
up partly investigations of a macreregion, limited to a better knowledge
of phenomena occurring within its boundaries, arousing our particular in-
terest and usually fitting into the framework of a single prehistorical
period. Those kinds of work are already in full swing, only to mention:
exploration in the area of an early mediaeval tribe of Wolinians,46 longlasting
investigations on the Kołobrzeg region41 and recent research on the
Neolithic Age effected near Cracow in the Nida basin territory.42

Quite to the point is on the contrary risking now the investigation of
selected mezoregions, therefore settlement units with an area of a few
to several hundred sq. km., employing the means of bigger archaeological
centres in our country. In today's conditions of techniques in field work,
and appropriate concentration of personal efforts and financial means,
each of these centres is able to thoroughly investigate one settlement as-
sembly of that category — in about 10 years or even a shorter time if the
organization of work be perfect. The above mentioned results of partly
investigations, conducted in large areas limited, it is true, to the finds of
a single period, or only to a determined type of objects, but achieved by
modest means — speak for such an estimation.

Stating the chance of conducting research in mezoregions, I should not
like to diminish the difficulties raised by such an enterprise. Their ex-
hauutive discussion would hardly fit into this article. Speaking quite
generally, we shall remind the reader that the mentioned difficulties are
typical today in all sciences, when conquering the impediment of switch-
ing to a qualitatively higher manner of achieving research works. A most
essential condition to the reaching of a better efficiency in realizing the
proposed process is an investigator's acquiring the skill of active work in
a large, specifically differentiated team.44 It is a skill difficult to master
if we consider that work in such a complex team does not consist in a
simple summing up of the activities of particular workers, but in their
close cooperation, the exchange of creative ideas,44 information and services,
in the mutual supplementation of conclusions between specialists of di-
verse problems, all tending to the realization of the team's chief research
aim. The point will be here not only principal changes in the organization
of research work or exchange of information, but also in the following
characteristics developed by longlasting tradition: the individual style of
putting forward and elaborating problems, criteria of the evaluation of
creative work and the emotional attitude of the investigators. The mentioned models of behaviour and values were formed in the days when the creative activity of a solitary learned man prevailed and was later complemented by the operation of smaller groups dispatched and surveyed by outstanding scientists. Those models are today a serious obstacle, impeding the intensification of research works and a more effective use of the research potential.

The necessity of turning to team work was obvious the earliest in exact and technical sciences, becoming remarkable already in the first half of our century. The alterations they had introduced have now become a general characteristic and the necessity of carrying out research by team work is today evident in all fields of science, including historical and social sciences. Passing on to a higher organization of work in complex teams proved to be easy for exact sciences, thanks to the advanced development of their disciplines, each of them able to elaborate a consistent theory, well-grounded investigation methods, ready cooperation with logic and mathematical sciences, homogenous language of information, finally over a hundred years' tradition of conducting investigations in small simple teams. Underdeveloped sciences that have already widened their horizon and therewith the range of their research needs, but did not manage to acquire appropriate qualities for solving new tasks by methodics, informative systems and a good organization of research, will have serious difficulties in meeting those requirements. Here belong archaeology and prehistory. The last 25 years have brought a large step forward in the extension of prehistorical problems and opening wide chance for that discipline. Making good use of earlier gathered archaeological observations it has been recently possible to undertake and elaborate a number of problems, essential for the understanding of culture processes in most ancient ages; also determined trends of further research, promising large possibilities, have been indicated. These measures were, however, not accompanied by an appropriately prominent and uniform development of methodics, the assuring of efficient information and organization of research works. The progress in archaeological working sections is particularly unsatisfactory. We also possess very insufficient experience to the carrying out, or even participating, in group investigations. The type of individual activity still prevails in research, although in this century's last quarter the share of several-people groups, indispensable to the exploration of larger objects, has considerably increased. The organization of cooperation in these simple teams raises moreover many doubts. Altogether, the matter of development concerning "archaeological praxeology" is today most urgent and indispensable. It should also be added that steady cooperation with other disciplines, so essential for our branch
of science, has still not been adequately set, notwithstanding many pur-
poseful theoretical discussions on this matter and reaching some practical
successes through direct contacts with other disciplines. The mentioned
deficiencies of archaeological research practice will still allow to conduct
microregional research or partly investigations in a large territory, they
are, however, an unsurmountable obstacle to the organization of a big,
specifically differentiated research team.

There is still an essential difficulty that hinders the formation of com-
plex teams, resulting from the workers' emotional attitudes. As was said
above, traditional models of acting and evaluating connected with solitary
production further dominate among archaeologists. Their majority not
being accustomed to group cooperation, is unconscious of its profits re-
sulting from team work. They prefer to take up a single task of their
own, rather than participate in team works, not taking account of the
fact, that the latter would certainly be more advantageous also to the
realization of their personal research aims. The indifferent and sometimes
quite negative attitude of many archaeologists towards collective action,
badly complicates all efforts tending to introduce a more modern system
of field research. Attempts at forcing the formation of collective research
teams will hardly be useful, for, according to Arnold Tookybee's saying:
"one can bring a horse to the trough, but one cannot force him to drink." 48

We may thus observe at present in our disciplines the outlines of a dis-
crepancy between the needs of a cognitive set of problems and the lack
of adaptation of our research practice and investigators' attitude towards
those needs. Seeking ways to conquer this discrepancy would outgrow
the subject matter and the frames of this article. I shall only draw atten-
tion to the importance that may have towards its solution the necessity of
fulfilling tasks resulting from actual social and economic needs of our
country. It is well known how much the necessity of preparations to the
celebration of the thousand years' anniversary of the Polish State, con-
tributed to the development of our disciplines. There is now indeed a want
of commissions to be compared with that action, there grows, however,
very fast a number of tasks connected with salvage research, carried out
in the territories of future great economic investments. I consider here
first of all the construction of artificial water reservoirs situated in river
valleys and lake depressions. Their size and quantity will necessarily in-
crease in face of the violently growing demand for water. The surface of
future floodings will amount to several scores of sq. km. They will usu-
ally include stretches containing the richest layers of finds, for it is known
that most intense settlement concentrated up to the Middle Ages mainly
in low territories, along waterways. Salvage research in the area of a
planned flooding may lead to the discovery of the main axis of settlement
in a there situated mezoregion, or to finding the junction of two mezoregions extended along a valley. Both cases give us the chance of gathering a serious amount of valuable and now much needed observations concerning settlement units of that kind. Salvage research in places designed for flooding may also fulfill the function of a practice experimental ground, elaborating and spreading models of cooperation in team works, busy in larger settlement units. The external conditions of these works and moreover the fact that investigators are placed in a compulsory situation, will favour their undertaking. All objections against team work lose ground in that circumstance. The necessity of investigating a large territory, deprived of the chance of complementing it by local exploration, compels a particularly strict evaluation of the scheme of observation. The limit of time designed for research and the destination of very fair financial means to the enterprise, obliges an intensification and better efficiency of techniques and organization.

The presentation of these possibilities of progress in the range of field works is grounded on the results of archaeological salvage activities carried out in the recent few years. Investigations accomplished in the depression of the Pakość Lake (Kujawy) designed for flooding, managed to achieve not only interesting research results, but they also successfully used more exact methods of territorial survey and analysing observations that deserve to be widely spread. I therefore presume that careful attention is due to the mentioned salvage activities. Moreover, very important and urgent is the matter of complementing effected discoveries by the investigation of neighbouring territories, in order to seize entire settlement mezoregions situated there. The dimensions of those additional investigations will not be excessive, as the thickest belt of findings lying in the endangered zone, will have been explored in the framework of salvage activity, while they will very seriously increase the effectiveness of the whole research work. We then can expect to obtain full materials for the characteristic of middle-size settlement units, so necessary for settlement analysis and the following further stages of the research process concerning prehistory.

NOTES

1 The diagram is very simple showing only the main stages of research and most essential relations; first of all permanent interdependence between the investigated reality (that are in archaeology the remains of human activities) and the so far reached amount of knowledge on ancient societies, activating the research

Archaeology “means a typical analytic science dealing with inquiring, selection, classification and description of material sources with the use of archaeological methods. In this meaning archaeology is a typical descriptive and auxiliary science [...] to Protohistory [Prehistory], History or History of Art or even History of the Material Culture. Protohistory [Prehistory] referring to the most ancient times has the same tasks as History in its narrow sense has, respectively of later periods. It deals with the whole historical process of the earlier epochs.”

The same author’s works have also been used to establish the diagram’s construction: *Archeologia i prahistoria* [Archaeology and Prehistory], “Sprawozdania z Prac Naukowych Wydziału Nauk Społecznych PAN,” Vol. I, 1958, No. 1, pp. 88, 89; i d e m, *Archeologia i prahistoria* [Archaeology and Prehistory], in: *Studia i szkice* Wrocław 1971, pp. 445–451; i d e m, *Zakres archeologii i jej zadania* [Le sens de l’archéologie et ses tâches], “Slavia Antiqua,” Vol. XX, 1973, pp. 131–135.


W. Ross Ashby has discussed research on that kind of systems in his: *An Introduction to Cybernetics*, London 1958, Chap. 4.16–6.22.

Conceived here as narrow systems being the actual objects of research and at the same time a part of a larger system investigated by a given science. Cf. Topolski, op. cit., pp. 149–162 and 311–330.


Lange, op. cit., pp. 36–42.


The large variety of methods and techniques applied to settlement analysis are not essential for the further considered problems.


An archaeologist’s very difficult duties have been precisely outlined by the prominent 19th-century investigator General Pitt Rivers, cf. O. G. S. Crawford, *Archaeology in the Field*, London 1953, p. 31 ff.

A considerable number of publications, mostly regional monographs, usually present the results of several settlement analyses, the authors of which had various
aims. Their frames of time-and-space are similar, they have a common basis of archaeological materials, it is, however, clear that in each case the authors had used a different set of indexes and other hypotheses, which were concerned with different kinds of systems.

13 This was not the only reason of mistakes occurring in this domain. Cf. W. Hensel, Problèmes d’une qualification ethnique des sources archéologiques. Esquisses protohistoriques, partie IX, “Slavia Antiqua,” Vol. XVIII, 1971, pp. 1–29
14 D. L. Clarke, Analytical Archaeology, London 1968, p. XII.
15 Cf. here D. L. Clarke’s accurate conception, Analytical..., p. 81.
16 V. G. Childe, Piecing together the Past, London 1956, Chapter I.
17 Quoted from Hensel, Archeologia..., p. 460: “The microregional method tending to investigate different settlement elements functionally connected in a smaller region, is a theoretical generalization of the way in which all investigations comprising a large range of archaeological sites should be realized.”


22 A diverse archaeological approach, different periods and cultures, always more or less various natural environment, seizing the remains of those settlement groups in various phases of their evolution, often those still distant from their full extension, etc.

23 The remains of larger human concentrations connected with settlement units of a higher rank, often discovered during micregional research, such as for instance early-urban centres and more ancient large Lusatian hillforts, are naturally not listed among the above characterized small settlement units.

24 The lack of space does not allow a more exact characteristic of the three basic types of settlement groups. I therefore present a much simplified scheme based on only one criterion, that is the groupment’s surface.


29 Okuńcz, *Niekóre zagadnienia...,* pp. 32–46. Similar divisions remarkable in


36 T. Wiślański, Podstawy gospodarcze plejmon neolitycznych w Polsce pół-

Systematic field investigations are the essence of this article. The urgent need of prompting activities aiming at the recognition of the dispersion and state of preservation of archaeological sites over all Poland’s area was stressed in: S. Kurnatowski, Funkcje prac inwentaryzacyjnych w badaniach archeologicznych [Les fonctions des travaux d’inventaire dans les recherches archéologiques], "Sprawozdania Poznańskiego Towarzystwa Przyjaciół Nauk," 1969, No. 1, (82) pp. 92–97.

Natural scientists can fully estimate only observations mutually completing each other, and comprising an area with a surface of at least several hundred square kilometres.


Cf. note 26.


A perfect example of such an exchange is presented in the introduction to N. Wiener's work: Cybernetics or Control and Communication in the Animal and the Machine, Cambridge, Mass., 1961.

Those groups followed only directions exactly determined by their master, not reaching out beyond the limits of his problems and information.

"I shall not be much mistaken" — are the words of W. Hensel in his Archeologia..., 1971 p. 463 — "stating that prehistory, being a typically synthetic science comprising the entire historical process of most remote ages, started practically in Poland only within the last 25 years."


The Polish Act on the Protection of Monuments obliges the investment enterprise to fully cover the expenses connected with salvage research in the endangered area.

The main stretches of land containing finds of a whole settlement mezoregion, densely inhabited in the Neolithic, the Hallstatt and chiefly the La Tène subperiod, have been found there. Finds of the second and third mentioned periods have provided materials for two actually realized doctor’s dissertations.