

ARIADNE'S CLUE IN EXCAVATIONS

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MANY people imagine that trenches for excavations are opened at random. The enterprise appears to them like a sort of gamble where one often loses, but sometimes wins. Nothing is more erroneous when it is a question of scientific excavation. It is only after the most careful study that the director of excavations decides to make his trench for boring and to mark his shafts. Nothing should be left to chance.

We have grouped in this article the study of the means which influence an excavator and guide him to make excavations.

These methods of research can be divided thus:—

1. Bibliography, cartography, numismatics and museum collections should usually be studied before making a start. In Paris the Bibliothèque Nationale affords the most wonderful facilities for this research.

2. The best conditions for investigation will always be found near the site.

3. The examination of clues, of traces left behind, on the surface of the soil, as well as survivals. The examination of traces which will be made on the ground and from the air, require close attention, care and time. Sometimes, after months of sojourn on the site, further indications are found on the surface which had previously escaped notice.

I—UTILIZATION OF PREVIOUSLY KNOWN DOCUMENTS.

It is necessary to distinguish between the sources of antiquity and those of the modern period. In fact the manner in which the documents are given, their accuracy, their different meaning, and their utility.

A—Ancient sources.

Ancient documents available for excavators are:—

- (a) Literary sources,
- (b) Inscriptions on stone or coins,
- (c) Images,
- (d) Collections.

(a) *Literary sources.*—The ancient authors supply useful information to excavators. The most important subject to be kept in mind is that which directly concerns the topography of buildings and their furniture, that is to say the framework of facts.

The simplest and most favourable instance is the direct account by an historian, a geographer or a traveller. There are a number of classical examples. In the Commentaries of Cæsar the description of the seat of the battle of Alesia,

the mountain of Auxois with its two small watercourses, and the plain of Laumes besides the details on the fortifications have been of great use to excavators. Ever since the excavations of the period of Napoleon III, it has been easy to identify the line of contravallation or investment of 16 *kilometres*, with its earthen rampart, its moat 5 metres wide, and its ground of *stimuli* or *trous de loups*.

One has found the parallel line of circumvallation destined to protect the Roman army taken in the rear by the Gallic allies.

The very detailed descriptions of the temple of Jerusalem in Ezekiel and in the book of Kings are the most important documents by means of which the Haram esh-Sherif, the ancient esplanade of the temple, can be explored.

The guide books deserve all the attention of excavators as one can almost always glean useful information from them. The *Periegesis* by Pausanias furnishes many examples: to instance only one, in 1877, at Olympia, when the excavators of the temple of Hera discovered the magnificent marble statue of Hermes carrying the young child Dionysius, they only had to open the valuable guide book to see that it was apparently an original work of Praxiteles found in the same place where it had been seen by the Greek writer, some 17 centuries ago.

Sometimes useful information can also be found in a treatise, a poem, and even in a play. When Cicero accuses Verres of depredations in the temples of Sicily he gives many useful and accurate statements about the disposition of places, personal property, statues of gods, etc.

Sometimes a simple recital of facts allows an idea of the plan to be made by deduction. The number of people present at an event indicates the size of the place; the time required to cover a distance may serve as an indication of distances; the treasures depicted indicate the fortified character of the structure, etc. Deductions of this kind have enabled us to recognize the chamber of the black Stone in the palace of Qatna, as the room where the treasures of the goddess Nin-Egal were concealed.

It may happen that the outline of imaginary facts is accurate and precise and may guide us advantageously. The poet Nonnus, in his *Dionysiaca*, Canto 41 and 42, gives us, in poetical fables, important information concerning the topography of the ancient Berytus. It is in this way that the list of temples appears under the enumeration of the gods who dwelt or enjoyed themselves at Berytus, the trade of the town is shown by the gifts that Bercoe, nymph of the town, received on her marriage with Poseidon. The place where Astarte appeared 'going out on the briny main' is fairly well denoted and is doubtless the site of the temple of the goddess of Berytus, etc.

Can it be inferred from all these examples that after the study of literary sources one can easily undertake and conduct excavations to a successful conclusion? Experience shows that it is not the case. Neither is the passage in *Cæsar* sufficient to make the discovery of the site of Alesia, nor has the passage in Pausanias discovered the masterpiece of Olympia. Whenever excavations

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are being undertaken on literary evidence alone they have been doomed to defeat. It would be depressing to recall examples. It is after the excavations have been made that one generally notices interesting confirmations! Texts and excavations throw light on each other. But sometimes also it is difficult to make the narratives of the ancients agree with the actual result of the excavations. A passage in Herodotus certainly appears to attempt to show that Byblos is situated at a certain distance from the sea. But the investigations of MM. Montet and Dunand prove that the ancient town immediately overhung the cliff. One has been obliged to put a different interpretation to the passage of Herodotus. It is rather far from maritime activities, that is to say, the harbour, must be understood.

Thus we recapitulate the position taken by the excavator with regard to literary sources.

1. Before making excavations: One should limit oneself to the study of ancient literary documents with regard to the relative importance of towns or monuments in the different periods, and obtain an idea of their approximate sites, that is to say, to obtain an idea of the localities. To attempt to infer any more would almost always be imprudent or rash.

2. During and after the excavations, the texts often give hints concerning the object and history of the building and sites. The names of localities, the names of objects, the meaning of figures, above all the religious sense of revealed objects often left unknown without any story, occasionally the remark of an author who has not attempted to give historical information. How many figures, for instance, would have remained for us almost incomprehensible without *De Iside et Osiride* and the *De dea Syria*!

When speaking of ancient literature in general and especially with reference to the East, one must put the Bible in the front rank—ancient literature on the whole gives nothing but very scanty assistance to the excavator in the preparation of his task. Afterwards it helps him to understand what he has discovered, but this enlightenment is of more use to the texts themselves than to the excavations. How much more intelligible is the description of the temple of Jerusalem in the book of Kings and Ezekiel, after one has found numerous earlier or contemporary temples, the Tower of Babel after one is acquainted with the Babylonian Ziggurats or the Cherubims, since the Assyrian discoveries! Open an illustrated Bible of the 17th or 18th centuries and you will see what could be reasonably understood with the text alone.

(b) *Epigraphic texts*.—The use of epigraphic texts from the point of view which we hold requires special examination. In this category we include, besides the stone inscriptions, tablets with cuneiform inscriptions and texts drawn on all kinds of objects, weights, shields, bronze documents, etc. These monuments are more frequently contemporaries of the facts which they record and are preserved in the original.

If the origin of the texts is unknown or known only approximately, they are not superior to the literary texts; on the contrary, they are generally scanty and not so clear. But if, on the other hand, the site of an inscription, its position, and its depth are carefully noted at the time of its discovery, the information is of inestimable value and can lead to interesting investigations. There is, in fact, a strong presumption that an inscription which is not on the surface of the soil and which has not been used again in a construction, is in its original site. In the main, epigraphic discoveries play the part of a first successful boring.

Papyrus and parchments of which the sites of discovery are known, may be classed with epigraphic texts from the point of view of excavations. The tablets of Qatna furnish a recent example of useful texts. The heading 'Tablet of the treasure of Nin-Egal, princess of Qatna' made known the name of the town on the site of Mishrife and made it possible to identify the temple of the Babylonian divinity because the place of discovery is accurately known and they have been burnt with the temple. The object of the building, the ascribing of its foundation to the 3rd dynasty of Ur, the date and Mesopotamian influence are thus established. The tablets and inscriptions of Ras Shamra discovered by MM. Schaeffer and Chenet enable us in the same way to recognize the name of Sapuna, the library of the scribes, and the temple of Baal Sapuna. The Celtic inscription of d'Alise-Sainte-Reine discovered in the early part of the 19th century and bearing the names of Alesia and of the divinity Ucuetin in Latin characters, has had an almost equal importance in the delicate question of Alesia.

The commemorative or dedicatory inscriptions on the lintels or the slabs fitted in the walls of buildings, the historical steles placed in the temples are naturally guides of exceptional importance, and good use should be made of them. A lintel of Byblos, actually in the Louvre has, by its text alone, enabled M. Dussaud to make an interesting reconstruction of part of the temple.

(c) *Images*.—A different source of information which completes those which consist of ancient representations of monuments or of sites. Antiquity has left us more images than one could imagine.

Coins often depict temples in the most useful way. We know thus the exteriors of most of the temples of Rome, of Baalbec and of the towns of the Syrian coast. Gods and great people who figure on coins are almost always, if not always, found to be reproductions of statues or bas-reliefs which are to be discovered. It is the same with the small bronzes of the late periods found in these places; Berytus affords examples: among the bronzes we can recognize the local statue of Jupiter of Heliopolis and the Greek statue from the temple of Poseidon also represented on coins. A small marble reproduces a statue of Eros riding on a dauphin, formerly, according to coins, on the flight of steps of the temple of Astarte.

The scenes on bas-reliefs chiefly in Rome, at the beginning of the 1st century show sometimes a decorated background representing buildings. The celebrated

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bas-reliefs of the Constantine period near the Coliseum, show us genuine views of the Forum ; one recognizes the rostrums, the arches of triumph, the capitol, the temple of Castor, etc.

The maps which we have inherited from ancient times can be compared with these representations ; they afford a valuable guide on the ground. One of the most celebrated is the map of Madeba in Moab, in Palestine. It consists of a mosaic of the 6th century. The buildings are shown in elevation and not in a plan. As regards the basilica of Saint-Sepulchre a half circle represents the dome, and not an apse as one would expect. It is nevertheless a custom which has been kept up in the cartography of the Middle Ages and in some cases down to the 18th century, for example, when showing villages.

It is not necessary, however, to believe that the ancients never understood maps as we understand them. The celebrated *Forma urbis*, or plan of Rome, engraved on the marble tablets of the Forum of Peace in Rome, was a genuine architectural plan. The fragments found have afforded invaluable enlightenment to excavators.

(d) *Museum collections*.—Ancient sites have nearly always furnished collections of objects found casually, or through secret excavating. Before excavating a site it is well to investigate these monuments.

Where objects of commerce are concerned the proof of origin cannot be accepted, unless the character of the object itself certifies the origin. Objects brought to museums by travellers or archaeologists are the safest guides. Unfortunately accuracy concerning the place of discovery and the depth of the soil is almost always lacking.

Under these circumstances, objects in collections can only furnish a general indication regarding the antiquity of sites, and the different eras which they represent.

In determining the age of the site of Mishrife, before the actual digging, according to the essay by the Rev. Ronzevalle, objects discovered accidentally played a very important part.¹

B—*Documents of a Modern Era.*

We have said that modern documents ought to be studied and used in a slightly different way to those which have descended to us through the ages. These consist of :—

- (a) Writings ;
- (b) Representations ;
- (c) Maps ;
- (d) Aerial Photographs.

(a) *Writings*.—The accounts of travellers since the Middle Ages are generally more easily made use of than the texts of antiquity. It is because in reality the

¹ *Mélanges de la faculté orientale*, t. VII, p. 109-135.

sites have changed less since the authors saw them. One can almost always check their descriptions at some point of indication still existing. Besides their interests are closely akin to ours. Topographical detail generally interests archæologists, pilgrims or ordinary spectators; they like to give information and they help us to find the monuments. The place about which the stories of travellers are most numerous is, I believe, Jerusalem. Often pilgrims will mention the number of steps which they have counted in order to give some point or other. One can imagine what valuable information is supplied by this.

For some years a considerable amount has been deduced from ancient reports concerning the construction and repairs of buildings. Information was found about the age of various works of art, the ancient condition of places, the names of architects and of artists, etc.

It is with this source of information that one must class statements concerning previous excavations. With this knowledge we have an idea what to look for on a site concerning its stratigraphy, about its antiquity, and we can recognize the origin of discovered objects more or less accurately. In practice their utilization in detail appears so difficult that generally the directors of operations avoid as much as possible the places already explored. This is unfortunate, because one should never leave an interesting zone before it has been exhausted. Items of knowledge throw light one on the other, and certain points of detail which when isolated are only of slight interest take on considerable value when united to others. One can say that, if the number of data increases in arithmetical progression, their interest increases in geometrical progression. Nevertheless *the majority of excavations have remained at the stage of boring.*

The difficulty is to recognize on the ground the borings and trenches described by predecessors. One generally notes the inadequacy of surveying. *Only very accurate maps and sections on a large scale can make possible the proper resumption of excavations begun by others.* Without these it is necessary to begin again and under the worst conditions.¹

(b) *Representations.*—Engravings of all kinds, rough drafts, panoramas and miscellaneous old photographs since daguerreotype are of the greatest importance.

In the excavations of Baalbec, the use of rough drawings by travellers was considerable. M. Deschamps at the Kراع du Chevalier, the Qal'a el-Hosn, has been able to recognize at first sight, thanks to the drawings and photographs of Rey, the parts added on by the inhabitants.

One must accustom oneself to be able to turn from a view to a map and *vice-versa*. Mechanical process actually makes it possible to turn from perspective survey to architectural levels and even to the corresponding plan. Churches

¹ The work of M. L. Speleers, *Les fouilles en Asie antérieure à partir de 1843*, facilitates research in many cases. It is desirable that essays of this kind should be published in all countries.

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destroyed during the war have been able to be reconstructed with the help of simple post cards.¹

(c) *Maps*.—Routes followed by merchants and conquerors often help us to discover human installations, to understand their origin and their meaning; rivers and springs are also guides.

Knowing the ancient customs, especially of local races, one can find out which are the most suitable situations for different buildings: to put oneself, if I may say so, 'in the place' of the architect charged with designing the town, the palace, the temple, and tombs.

The first consideration in making a town, a palace, and sometimes a temple, was its military protection. The excellent book by Colonel Ardent du Pic, '*Le Combat*,' allows one to judge of some of the necessary precautions which this imposed. Scaling the walls had to be rendered difficult by making the slopes steep on which the projectiles rolled.

For the temple, it was the traditional element which played the most important part. A mound, already sacred, was searched for, or, if necessary, a terrace was made.

For the tombs, the side of a slope lends itself perfectly to the hollowing of chambers. They also sought to avoid floods.

M. Schaeffer has used such a method with success at Ras Shamra. 'If I had been the King of this town, I would have built my palace in that place from which one could see the sea and the roads round about.' The palace was indeed there: the excavations proved it.

Toponymies will be the object of serious examination for discovering (1) comparison with ancient names; (2) interesting roots as in Baalbec, Ba'albi. The names of fields and of localities are instructive. For example, the field of the '*Chirous martyrs*' covered before the excavations, the merovingian hypogeum of Dunes near Poitiers. It is prudent, however, to accept these comparisons of names, in the absence of other proof, only as an indication, as a simple question mark.

A propos a criticism of the work of M. Victor Berard, *Les Phéniciens et l'Odyssée*, M. René Dussand justly says: 'toponymy and topology remain useful auxiliary training, but are inadequate. It is necessary to call in archaeology.' All documentary literature should be verified by an archaeological study of the site.

(d) *Aerial photographs*.—Plans and maps are supplemented in a marvellous manner to-day by aerial photographs. The easiest to use are the vertical photographs which appear like a plan excepting general deformations which are negligible for ill-defined surfaces. The modern process permits all desirable corrections to be made.

¹ *La Science et la Vie*, No. 172 (Oct., 1931).

Aerial photography supplies to archæology plans of sites, of ruins and of excavations which, if done trigonometrically, would sometimes entail a very long time and considerable expense. In very complex ruins there is no substitute for plans from aerial photographs, and the same applies to inaccessible sites. In modern map-making, two or three photographs of the same zone enable the contours of the land to be established.

Information of another kind and not less precious is the observation and photographic fixation of indications of surface to which we shall again refer. In this case aerial photography makes it possible to discover ruins or vestiges of ruins entirely buried. Indications which are invisible on the ground and likewise in direct observation from the air can be revealed by aerial photography.

It is better still if several photographs can be prepared, taken in varying lights and at different seasons. Certain indications will be visible only on certain negatives.

Knowing the focal height and length, one can calculate the scale; unfortunately, it is very difficult to determine the exact height of the aeroplane in relation to the site; the altimeter requires several instants to regain its equilibrium and always gives the height in relation to sea-level or the place of departure. It would be better to calculate the scale in relation to the known geodesic points or by stereoscopic photographs. It is easier when one can place on the ground, at the moment of taking the photograph, an object whose length is known. The Rev. Poidebard often used two aeroplanes,—one used to land in the field of the photographs in order to give the scale for measurement, the other at the same time took the photograph.

For archæological research, proofs giving details of the ground on a large scale and taken above 600 metres are preferable. To examine an aerial photograph one notes first from which direction the light came at the moment of taking the scene. It is this side which should be placed as the top of the photograph, for otherwise one is liable to take reliefs for depressions, and *vice-versa*. One should place oneself under a strong light and make the examination with a magnifying-glass. It requires some practice in order to recognize readily tracks, streams, quarries, etc. and also to distinguish the reliefs from the shadows according to the hour at which they were taken. The best documents are those which have been obtained under slanting sun rays; that is to say, during the early and late hours of the day.

Aerial photography gives excellent information to excavators. It has made it possible for Father Poidebard, of the Beyrout University, to reconstruct a part of the system of roads of the Syrian *limes*; the situation of the strongholds of the line of defence has been clearly recognized; also several camps and circular towns of the greatest antiquity.

It is quite obvious that the data from maps and aerial photographs must be verified and completed by topographical study on the ground. These are two



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THE TELL KHAN SHEIKHUN EXCAVATED IN 1930 BY THE AUTHOR, AND
THE TELL SHEIKH SAYYAD IN THE BACKGROUND. THE TRENCHES
OF EXCAVATIONS 1, 2, 3, AND 4 HAVE UNCOVERED SIX STRATA OF
CITIES; FOUR OF THE IRON AGE AT THE TOP, AND TWO
OF THE BRONZE AGE UNDERNEATH.



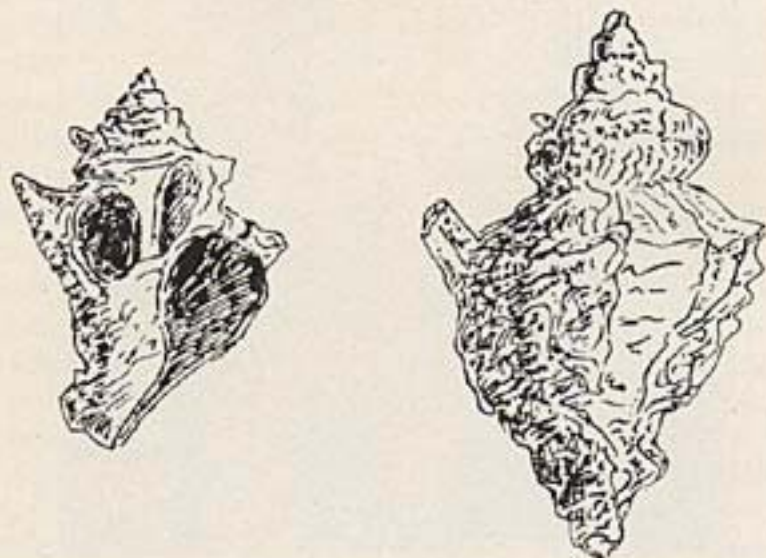
THE CHARACTER OF VEGETATION MAKES IT POSSIBLE TO RECOGNIZE THE NATURE OF THE SUB-SOIL. DURING THE EXCAVATIONS AT DNEBI (SYRIA) A CLUMP OF THISTLES, WHICH HAD GROWN OVER THE OPENING OF THE TOMB AND RETAINS THE MOISTURE, HAS SERVED AS A GUIDE TO THE EXCAVATORS.



THE SAME SITE AFTER THE EXCAVATIONS, SHOWING THE ENTRANCE OF THE SHAFT. IN THE BACKGROUND ARE SEEN SEVERAL VASES FOUND IN THE GRAVE.



RUINS COVERED BY DRIVEN SAND AT THE SITE OF UR IN BABYLONIA. SOME OF THE RUINS ARE ONLY PERCEPTIBLE BY SMALL INDICATIONS IN THE DECLIVITIES OF THE SOIL.



MUREX TRUNCULUS OF THE PHOENICIAN COAST. ACCUMULATIONS OF THESE INDICATE ANCIENT SETTLEMENTS OF DYERS. THE HOLE CAN BE SEEN THROUGH WHICH THE ANIMAL WAS EXTRICATED TO SERVE IN THE PREPARATION OF PURPLE.



THE TELL ZAFFARANI, NEAR MISHRIFE-QATNA IN SYRIA. SOME AUTHORS CONSIDER IT TO BE THE SITE OF THE ANCIENT ZIFFRON IN THE BIBLE. TOWARDS 'THE GATES OF HAMA'.



A MARRIAGE FESTIVAL AT MISHRIFE. THE BRIDE IS SEEN COVERED WITH A WHITE VEIL ON THE FIRST CAMEL.

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classes of research which lead to the same end. The same controlling idea directs them.

II—ARCHÆOLOGICAL INVESTIGATIONS.

To whom should one apply? What steps should one take to obtain accurate information about the present state of a site, legends concerning it, about casual discoveries, or secret excavations?

It is obviously necessary in the first place to apply to those services that have been specially created for this in different countries: Offices of antiquities, Department of historical monuments, Archæological Survey, etc.

Intelligence officers can often give valuable indications; their duties oblige them to frequent the smallest villages; they often tour on horseback; the mayors or *monktars* and peasants try to obtain their favour; accordingly they are very pleasant to them and often present them with antiques. Amongst these officers one often meets enquiring and cultivated minds, happy to help a scientific mission, and some of them have collected notes and photographs worthy of publication. Even though officers of the Intelligence Services are unable to guide us in our researches, they will at least know how to put us on the right track. Monks, Officials, Survey Agents or Tax Collectors frequently give most useful information. The Hittite Stele of Ghur el-Assi actually in the Louvre, was found by an engineer of the D.H.P. railway, and was acquired by a Jesuit (Father Ronzevalle), the great mosaic of Karm el-Arabis near Homs was seen for the first time by a captain when exercising his company, etc. The accurate and indispensable data are: the name of the exact spot transcribed in French and in the language of the country, and its geographical position. For the rest, one must go and see the place.

The experience of Archæological Missions prove nevertheless that the information obtained from people living on the sites themselves is the most valuable. Primitive people and peasants are generally excellent observers. While hunting, ploughing, digging pits, they notice many details, they have made accidental discoveries or secret excavations. The secrets of the discoveries are handed down from father to son in certain families.

The questioning of mayors and peasants is a very delicate matter, requiring tact and experience. It is essential to go slowly and to use all one's ingenuity in order to obtain their confidence. When met by an evasive answer, do not be persistent, talk of something else, and then return to the question. Specialists in Folklore have for a long time used the best methods of making local enquiries; in fact it is their principle source of information. 'The questions which one puts to peasants', says one of them, 'ought to be of a kind not only not to induce psychical opposition, but also not to suggest an answer which would be false or indirect. Peasants often feel a kind of shyness with regard to people who belong to another social state and whom they feel are better educated. They

believe that when they are questioned on their manners and customs one wishes to ridicule them. Sometimes they show very little interest. I have had great difficulty in studying Kabyl potteries because the Sheikhs and potters took me for a financial inspector looking for objects and industries capable of being taxed. Nevertheless here is a means, which is valuable for enquiries concerning folklore. To relate at first how things are done elsewhere and to ask if it is the same in the village one is exploring. In Savoy, they put the dry skin of a toad in a barn to drive away insects. One tells them this, and asks what steps they take here for the same purpose. One begins to sing some popular songs, and soon the people of the village sing their own to you. One describes marriage ceremonies in various countries and the people describe to you their own customs.¹

The Archaeologist likewise relates the results obtained elsewhere, cleverly glossing over the fact that rewards have been given, making it clear that the excavations provide work in the slack seasons, etc. One should exhibit the objects which are of interest. The explanations become particularly clear when the informer is taken to the places. It is frequently during a visit to the ruins that the natives give explicit and interesting information. It is necessary to spare no trouble to make them understand exactly what is wanted. One should never jeer, and above all not be sceptical. One should listen most seriously and reply in the same way.

One should ask the residents to point out large stones, engraved stones, carved stones, underground walls, caves.

The legends attached to sites should not be neglected. They should be collected with the greatest care, because they most often refer to ancient distorted facts. The topographical points denoted by these stories are generally of ancient places of culture or the scene of interesting events. Often also saints or *sages* have succeeded the gods.

Talking of clues by means of relics, we shall revert to some instances on this point.

It will be necessary to listen patiently to many useless tales to glean information which is often valuable. With time and patience, one should be able to induce the peasants to show the objects which they have accidentally discovered, but it is necessary very often at first to gain their confidence, by living some time amongst them. Damaged ruins and cemeteries are most easily recognized. One must endeavour to weigh the answers of one against the other, being very careful to respect the self-esteem of each.

The allurements of a reward is generally very great; a present of some francs is a good method of loosening their tongues, but it would be dangerous to make the peasants think that they can derive exorbitant prices from treasures that

¹ Van Gennep. *Le Folklore*, pp. 42-43.

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they conjecture are hidden in their ground. Besides it must not be believed that these examinations, however skilfully they may be made, exhaust the subject. To learn from the inhabitants all that they know would entail a long residence generally of many years.

It is indispensable to have the confidence of the entire population, and this is a long-winded task. We must succeed in making it understood that we do a disinterested work. Seeing all that happens on a big day in the excavations, that the discoveries are made known, the objects exposed, that the fragments and old walls hold so much of interest, the native ends by understanding that they are not material treasures that are sought; he does not understand very well but he feels proper respect for them. In order to create sympathy it is necessary to be interested in local affairs, to take part in festivals, to help the village in its disputes with authority, to be always ready to take the inhabitants under one's protection; fellowship is very strong among primitive people and one must hob-nob with the people of the village or city. If one is not able or does not wish to take part in religion, one should at least have the greatest respect and maintain the best relations with the chief representatives of the creed who are always influential and well-informed. Finally in our learned missions, assistance ought to be largely practical; the best form is the care of the sick. The peasants or natives ignore the elementary rules of hygiene; only by preventing them from applying their dangerous methods and by substituting for these simple and sensible remedies, we often cure them and always give relief. At Mishrife, we have a regular little dispensary, where we do dressings, distribute quinine, etc. My collaborators sometimes supply some magical prescriptions, but this is not necessary.

III—INDICATIONS.

After the thorough examination of men, the investigation by means of things, here the excavator enters his own particular province.

It is important to define two items which we will constantly meet: clues and evidence. Clues are the signs announcing the presence of a monument in the widest sense. Evidence is a part of the monument itself; for example: the colour of the soil above a buried wall is a clue, the stones which emerge are evidence of the construction. When a group of evidence of a building appears of some importance, we call it *ruins*.

If the ruins exist on the surface of the soil, before excavating, they ought to be minutely examined and studied. In order to form a correct opinion of a structure, it is absolutely necessary to have a plan. If this does not exist one must be drawn. The nature of a building, its decoration, in which style and what period, ought to be determined by comparative methods. The comparison can be very largely understood mainly by that which alludes to the *object* of the places and things. In reality if ruins exist the work presents itself as if the

excavations had already begun. It is the same case when one can come for the first time to the stage of clearing away. For instance, M. Deschamps, when he discovered that the large underground chamber of Qala'a el-Hosn had been filled up by the refuse of the village, he immediately ordered it to be cleared away. The filth accumulated since many centuries represented 50,000 tons. The excavation brought to light remarkable sculptures: 'I saw with the greatest astonishment' said the learned Curator of the Museum of Comparative Sculpture, at the Trocadero, that the chamber measured 120 metres long. The inhabitants of the Qala'a el-Hosn quite simply turned the big underground chamber of the fortress into a cesspool by opening a round hole in the ceiling and by bricking up the entrance.

In the majority of cases, the archæologist cannot act so quickly, he must move slowly and as if feeling his way. For the moment, we will apply ourselves to the indications, that is to say, that we will only consider the case where the site is destitute on the surface of either evidence or of ruins.

We will investigate successively:—


1. General topographical indications;
2. Particular topographical indications;
3. Geological indications;
4. Indications of human activity;
5. Indications from the colour of the soil;
6. Indications furnished by vegetation;
7. Magnetic indications or those of an analogous nature;
8. Indications from survivals or moral indications.

We are speaking here only of the indications of the surface. Of the extent of boring and of investigations after rubbish has been cleared away, we will meet other indications that we will study elsewhere.

(1) General topographical indications.—These general indications are those that one can read on a good topographical map. We have given an idea in speaking of the use of a map. Meanwhile by seeing a district when travelling, complementary ideas are suggested that we must make use of in order to develop and to affirm the conclusions of cartographic study.

The works of men can often directly or indirectly modify the relief of a site. Often by a considerable effort, hillocks have been raised up to serve as earth-works for buildings (Khorsabad), or for ramparts (Qatna), or to conceal tombs (tumuli), or for many other, sometimes mysterious, reasons. At other times, spacious excavations have served as a reservoir, for canals, for moats in defence. By a different process, heaps of ruins and accumulated waste (ashes from fires and furnaces, etc.) have produced hillocks and sometimes hills which are recognizable on the map. In former times, in the whole of Asia and in Egypt, the ancient towns and villages left huge heaps of ruins, of earth and refuse. They are called *Kôms* in Egypt, *tells* in the Arabic countries of Asia, *tepehs* on the

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Persian plateau, Afghanistan, the Taurus and Asia Minor, and *kurgans* in Russia. *Tepehs* and *kurgans* are often funeral tumuli. In Egypt, they are designated since great antiquity by the name of *iat*, a mound made of ruins as well as a tumulus, in the same way the village which generally crowns the hillocks in Egypt. In determining the word, one identifies a *kôm* in the shape of a dome, surrounded by a fence and surmounted by a pavilion ¹. For the

sake of simplicity we call all these eminences *tells*. Those which denote the towns and villages generally show a flat table-like surface, which is easily explainable. Their shape has often been made regular in ancient times, and they are to-day little regular plateaus, generally bare. The *tells* have sometimes been constructed of all sorts of material, to form the imposing platform of a town which perhaps has not been surpassed by its neighbours. In this case the upper part often forms a more or less deep basin (Tell Nebi Nuh, Syria). The *tells* show on one or two sides a gently sloping inclined plane for ascending, out of which erosion has generally made a ravine; these points indicate the site of the gates. The *tells* in the steppes or plains of Russia can be recognized from a considerable distance.²

(2) Particular topographical indications.—The indications are denoted by slight declivities and secondary reliefs of the ground surface.

In order to see the reliefs clearly, one should, for preference, go round them in the morning or evening. The bright sunshine at noon disperses the shadows which are necessary for a good view. Failing a slanting light, one can make up for it to a certain extent in the view of a flat open country; one makes his observations obliquely, that is to say in placing his eye near the ground, one perceives the slightest declivities in profile.

It is by these contrivances that particular topographical indications have their beginning.

An abandoned construction always tends to level itself, that is to say, if the remains form a relief above the ground, they tend to sink as far as the horizontal level, and if they form a hollow in the ground the cavity tends to fill up. This is an application of the law of gravity which controls equilibrium and horizontal stability. Nevertheless it would be easy to demonstrate mathematically by this law alone, that reliefs or hollows tend towards the horizontal plane without ever reaching it; in fact the nearer they approach it, the less the action of gravity becomes. The graph will become a curve tending towards

¹ V. Loret, *Revue égyptologique*, X, 1901, pp. 87-94. The hillocks cannot, as has been stated (*Bulletin de l'Institut français du Caire*, III, p. 145), be surmounted by a bush: the water of the Nile without which vegetation cannot grow never reaches the top of a *Kôm*, the shape of the little upper pavilion (perhaps fencing) has been confused by its resemblance to the lid of a sarcophagus.

² The question of *tells* will be taken up in the conferences of the third year.

zero without ever reaching it. It is the first and principal structure of the formation of these reliefs which show actually the presence of a monument by an embossment or a hollow, sometimes a combination of both.

When it is a question of a ruin which sinks slowly, its relief itself can check the particles carried away by wind and rain, fixed to lichen and moss, these are then the causes which lessen the levelling action and can themselves make eminences like those seen in Egypt, close to the desert.

When, on the contrary, it concerns the remains forming a cavity, chamber, or deep cave, basin, tank, pit, etc. the debris are always more liable to accumulate than the surrounding soil, hence a slow action which retards the levelling.

The conclusion is that after a very considerable time a completely collapsed and buried ruin always presents the appearance of a flattened hillock, and that a filled-in cavity appears almost invariably like a shallow basin. This is naturally so if man, or some exceptional circumstance does not upset everything. If, for example, a town has been erected on a ruined site, there is obviously every chance that the topographical indication has disappeared.

I lay stress on the shape of a shallow basin which is taken by the cavities, it is characteristic, it is also an application of the laws of nature.

Common graves are shown on the surface by a small heap of elongated earth, or on the contrary by a slight hollow due to the subsidence of the earth following the decomposition of a body. Often a series of graves in rows produce a kind of undulation of the soil.

However good a map may be, it never gives an absolutely adequate outline of the ground, most of the time, particular topographical indications can only be seen on the ground, or by photographs from the air. Occasionally the depression or the relief indicates a building not exceeding some centimetres; infinitely more so the traces of works which have never had a large relief such as an ancient track, for example the furrows of ancient fields reconquered by the desert. Often the top of walls round the edge sharpens somewhat, in such a case one notices the alignments of characteristic stony tops. The lines producing a geometrical plan should attract all our attention, and especially their symmetry. This applies equally to the other indications.

(3) *Geological Indications.*—Geology teaches about the formation of rocks, their natural arrangement, stratigraphic superposition, changes that can happen to them. These data enable us to recognize the modifications that man has been able to bring to bear on the natural state and which are indications of his works.

Here are some examples: an accumulation of fragments of stone on a level area indicates a workshop of the stone age; if the chips are flint it may be prehistoric; the defective pieces thrown away by the workmen at that time, date the period. The fragment of flint is recognized by the bulb of percussion or swelling that occurs about the place that is struck.

The construction of a stone building always allows for a stoneyard where

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the cutting of stone and rough-hewing of sculptures is done, but it can be remote from the building itself. This was the case with the temple of Jerusalem according to the Bible.

The excavation of a gallery, a well, a tomb, a hypogeum produces accumulations of rubbish and fragments in proportion to the greatness of the work. Here is a statement of J. de Morgan: 'In regions like that of the cemetery of Memphis where the geological layers are palpably horizontal, the different strata show neither the same composition nor the same appearance. It is easy to recognize them from small specimens. If it is encountered above a layer of sandstone, for instance, on the surface of the soil, a certain number of fragments of natural limestone deposited below the sandstone, it means that these fragments have been artificially put together and that ancient pits are in the neighbourhood.' The tomb of dogs at Saqqarah has left large heaps of rubbish on the side of the hill.¹

Ancient quarries are recognized by the level and rectilinear sections made in the rocks. The mines by the waste left behind by the excavations and by the cavities that are recognizable in the ground. The waste is composed of rubbish left from the extracting of ore; it discloses the nature of the metal. At Khalkal in Persia, huge heaps of waste exist near the mines, to-day hidden by fallen rocks. In Transylvania there are innumerable pits which disclose the auriferous veins worked in ancient times. At Sinai, one meets again ore wastes and galleries.

In the research of caves used by man it is important also to have a knowledge of geological formations. They are generally formed in massive limestone and those which have been lived in are more frequently opened to the South.

It will be a good thing in this study to have the assistance of a geological map.

(4) Indications furnished by refuse and waste left behind by local industries.—Although these indications are in the majority of cases underground, they can be met with on the surface.

Count Begouën has noted that while excavating they sometimes recovered paintings on the surface of bones, fragments of flint or other remains indicating prehistoric stations.

The refuse heaps which can be recognized are almost always mixed up with ashes showing fires and ovens for cooking; they consist of bone, bearing marks of incisions and fire and of shells. The shells of snails and oysters sometimes form important accumulations revealing prolonged existence. Generally ceramic remains are mixed up with rubbish.

Besides the indications of human work above noted, there are others that

¹ J. de Morgan, *Les recherches archéologiques*, 1906, p. 55.

leave traces on the surface. Remains of colourable matter, oxide of iron, powdered lapis lazuli, various clays can be preserved indefinitely. Purple was extracted from a small gastropoda which was pierced from the side. There exist in Tyre and Sidon huge accumulations of these shells which are mixed up with the earth; I have observed them also at Beyrout. These are traces of workshops of interest for the commerce in ancient times, also useful for local topography (outskirts and certain quarters of towns).

(5) Indications from the colouration of the soil:—They are often made use of in the East. Large bare surfaces, without noticeable relief, lend themselves admirably to observation on the colouration of the soil. In order to be seen under the best conditions these variations of colour ought to be as far as possible observed from above, normally on the ground if it is possible. It is in the same way that these indications are more easily seen on horseback than on foot. In an aeroplane, at a low altitude, they show up, and very good photographs can be taken of them.

There are generally atmospheric agents which make these spots visible, most often by the following mechanism: the foundations of the buildings being more or less permeable than the surrounding soil, a portion of the ground dries more quickly and shows more clearly than the rest of the soil. Foundations of dry stone, form veritable drains, draining especially well the land that covers them. Sometimes it is the frost which turning the water to a thin coating of ice reveals what part of the ground has been drained by the substructions.

At other times, the water dissolves certain mineral particles. At Tello, Commandant Cros tells us, it is 'after heavy rain, which results in washing the soil, which is very full of salt, one can perceive, 11 metres from the redout, the foundations in rough bricks of a great building.'

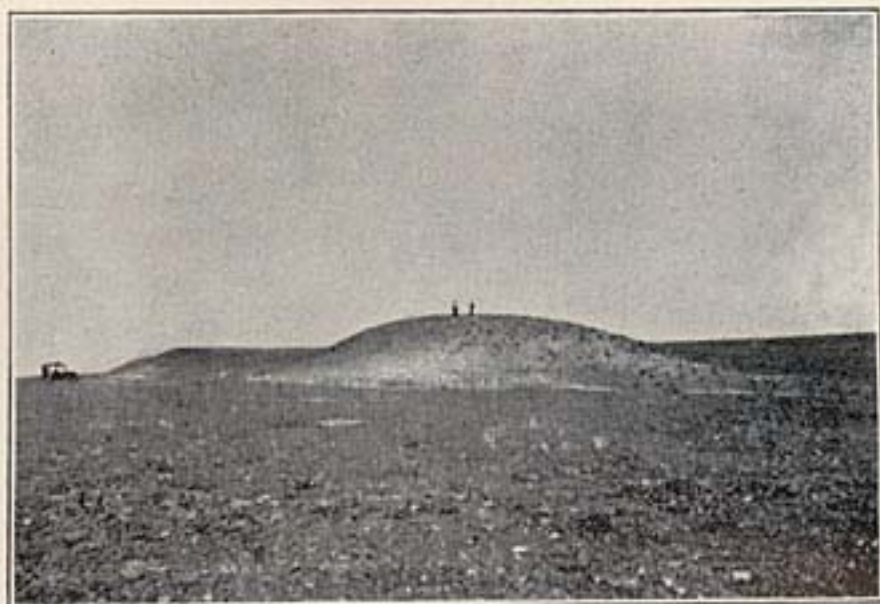
In 1927, Father Bovier-Lapierre gave a description at the Egyptian Institute of the wonderful discoveries of Fayyum. The neolithic tombs can be recognized in the sand of the desert by their lighter colouring, showing the very slight relief about which we have spoken. J. de Morgan had formerly made the same observation: 'Prehistoric and primitive cemeteries can be recognized in the desert where the ground shows a quantity of spots, of clear sand very near one another. The spots corresponding to the tombs of which the earth is heaped up are caused by a depression which the wind fills afterwards with fine sand. The tombs show the same external appearance as the vaults of an early historic period, it is necessary to make some investigations, then, once the cemetery is discovered, it is enough to attack all the points in which an iron bar will easily pierce the ground.'¹

(6) Indications supplied by vegetation.—They often show signs similar to those produced by spots on the ground.

¹ *Les Recherches archéologiques*, p. 47.



FOLK FESTIVALS ON THE ARCHEOLOGICAL SITE OF MISHRIFE ARE A CENTRE OF ATTRACTION OF THE DISTRICT. THESE FETES PROBABLY DATE BACK TO THE PROSPEROUS TIMES OF QATNA.



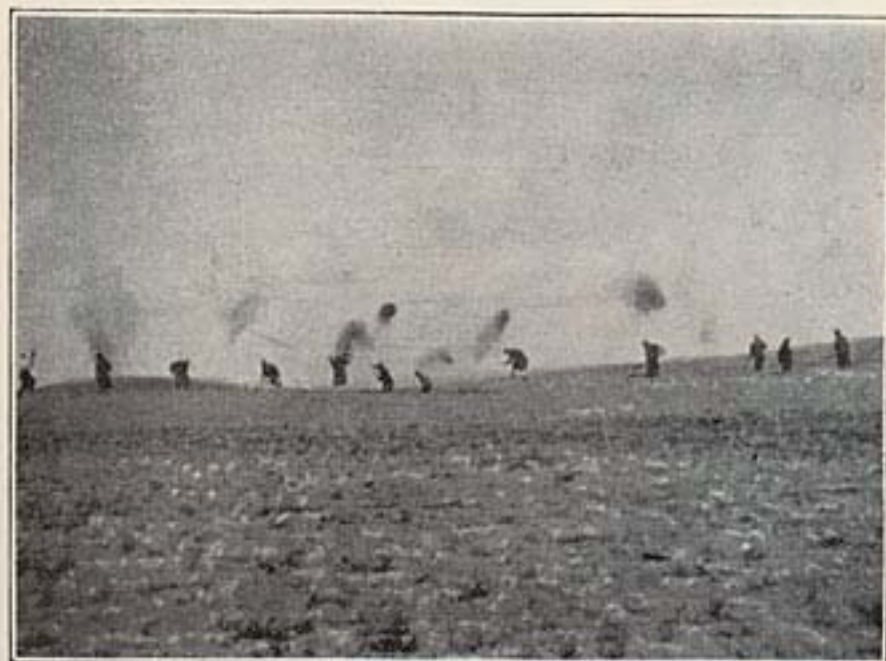
THE TELL KNOWN AS 'THE FATHER OF HORNS', AT THE SE OF HORNS (SYRIA). A SITE OF A TOWN OF THE SECOND MILLENNIUM, WHOSE ANCIENT NAME IS UNKNOWN (DISCOVERED BY THE MISSION DU MESNIL).



THE SHEIKH ABD-EL-KERIM, OF THE MOSQUE OF KHAN SHEIKHUN, SHOWING TO COUNT DU MESNIL (ON THE RIGHT) PROMISING PLACES FOR EXCAVATING.



IN THE CEMETERY OF DNEBI (TUNIP) SYRIA. THE SEARCH OF GRAVES
BELONGING TO 2000 B.C. AND INDICATED BY THE CLUMPS OF
VEGETATION.



ON THE TELL KHAN-SHEIKHUN EXCAVATED BY THE MISSION DU MESNIL
DU BUISSON IN 1930, THE WORKMEN THROW THE EARTH INTO THE
AIR TO BE CARRIED AWAY BY VERY STRONG WIND.



ANCIENT STRATA A-B INDICATED BY A NARROW LINE IN THE TRAVERSE
OF THE TRENCH (EXCAVATION AT MISHRIFE, QATNA PALACE.
THE HALL OF THE GREAT VASE.)



ON A BASALT BASE AN ALMOST INVISIBLE CIRCLE IN LIME INDICATES THAT
THERE EXISTED A PILLAR OF SMALL DIAMETER PROBABLY OF WOOD
AND WHITE-WASHED (SAME PALACE, NORTHERN SECTION).

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Commandant Cros tells us how the site of ancient Shirpurla (Tello) is indicated on the ground¹: 'In the spring, when the desert is covered with a faint green tint the boundaries of the ancient town are determined by an oval surface running from North to South, being four kilometres long, about two wide, and appear like a yellow spot on which a blade of grass cannot grow.'

Each plant makes a little boring for its root, one must know how to recognize this when meeting it. The disturbance that the presence of subterranean ruins cause to vegetation is the result either of hydrometric irregularities already mentioned, or of the presence of materials unsuitable for vegetation such as stones or bricks, on the other hand particularly heavy moulds and soils are favourable. It is obvious that the presence of a slight depth of soil flagged or paved with concrete, or a stone causeway, hinders or constricts vegetation; if the materials are quite near the surface, they are generally the least gramineous; if they are more deeply buried they will be deep-rooted plants and bushes which are sustained by the condition of the sub-soil. If, on the other hand, a cavity is formed filled up by foliation or with vegetable refuse, these offer a very favourable medium for the growth of plants.

Trees show a certain symmetry between the roots as well as in the trunk and branches. A fir-tree which is well-grained and has a tap-root which is deeply buried, an oak which spreads out its branches over a considerable space possesses roots which extend far and to a moderate depth. This information enables us in certain cases to recognize the approximate depth of an obstacle to vegetation in the sub-soil, especially the presence of rock.

(7) Magnetic indications or those of an analogous nature.—As a piece of information and in order to be complete I must point out that in the examination of mines, engineers utilize the properties of the magnetic needle. In fact the metallic masses distract the needle and cause it to deviate.

It appears also that empty subterranean rooms affect the hazel-twist or pendulum; at any rate this seems to result in the case of many discoveries.

The process has been employed with great success in the excavations at Capera, near lake Leprignano, in Italy. By means of the hazel-twist four Etruscan tombs were discovered, with an interesting inventory.² In Palestine, near Abu-Ghosh, while looking for a spring 'a cave completely hidden under a layer of rock was found. The "water-diviner" had definitely marked it as being empty'. The tomb in question had a shaft with a bench, of the iron age.³

The attempts of investigating by sound that we had made several times, gave us no result. In striking the rock with a sledge-hammer, one sometimes obtained a loud resonance through a mere crack when the proximity of a room gives only a dull sound. At Alesia, however, M. J. Toutain, has obtained successful

¹ Nouvelles fouilles de Tello, campagnes de 1903, p. 5.

² *Le Miroir du Monde*, 1931, p. 170.

³ *Revue Biblique*, 1921, p. 97.

results, in striking the ground of Gallic houses. The resonance revealed to him a curious silo that he only had to open.

(8) Indications from survivals are the result of this principle that that which exists has a tendency to continue to be. Societies hold inherited funds which compel them to preserve that which exists, above all in the religious domain. This is also the case with topographical survivals, they are extremely ordinary, if I may say so. Temple, church, mosque often succeed one another on the same site. At Mishrife although the site had remained uninhabited during centuries (perhaps more than 2,000 years), the site of the temples on the mound of the church seems to have been preserved for the sake of tradition among the shepherds of the desert. In consequence, when the inhabitants returned to settle upon the site of Qatna, about 60 years later, they put their church outside the village, on the ancient High-place. It is the same tradition that is of value to us in recognizing the same site even now badly expressed as 'Qubbet Luth' (Qubbet=small building, probably here 'little temple'). In a general way, all the marabouts, the *qubbes* in the country merit attention. The places denoted by legends are also very deserving of examination. The St. George or Khodr of Beyrout provides an example. The place of the combat of St. George that they still show one near the town is the seat of very ancient legends which appear to go right back to antiquity, because as early as this time one of the principal divinities of Berytus, Eshmun, was represented escorted by two dragons and with almost the features of St. George. Some remains have since been noted in the same locality; it would be interesting to make excavations of them, for the traditional indication appears precise and ancient.¹

Very often the tracks and roads, although many times repaired, remain in the same place. The road going round the circumference of the town indicating the interior and exterior is generally preserved after the demolition of the rampart and suffices to indicate it. This phenomena can be observed at Pompeii and in many towns of the Middle Ages. At Beyrout, the roads show clearly not only the plan of the ruined ancient rampart but that of the Roman circus long since disappeared and hence the outline of *decumanus maximus*.² The burying-grounds are often kept up on the same site since ancient times.

The boundaries of the fields can reveal the former state of sites. At Alesia, the *cavea* of the theatre, entirely ruined, can be recognized by a curved line separating the cadastral portions.

It is quite evident that the different kinds of indications described here are merely examples and that the ingenuity of each one should tend to discover and use other signs. It is a matter of occasion and ability. In this domain, the excavator ought to emulate the most shrewd detectives.

¹ *Bulletin de la Société française des fouilles archéologiques* 1925-26, p. 82 à 134; *Mélanges de l'Université Saint-Joseph*, 1927, p. 251. à 265.

² Quartier Saint-Elie, below the Grand Serail, to the N-O.