HUMAN UNDERGROUND SETTLEMENTS IN CAPPADOCIA: A TOPOLOGICAL INVESTIGATION OF THE REDOUBT SYSTEM OF GÖSTESIN (NE 20).

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Riassunto

Dopo aver ricordato che le ben note città sotterranee, quali Derinkuyu e Kaymakli, attendono ancora una chiara e definitiva datazione, si attira l'attenzione sul fatto che tali città devono essere considerate solo come una delle molte forme di strutture sotterranee protette da porte-macina presenti nei tufi della Cappadocia. In questo lavoro vengono descritte e discusse le strutture sotterranee che si aprono nel corpo di una piccola collina tufacea contigua al villaggio di Ovaören (precedentemente Göstesin). Le caratteristiche degli ambienti sotterranei indicano con sufficiente chiarezza che ci si trova in presenza di sistemi di difesa che per la loro elementarità possono essere definiti "ridotti" sotterranei. Questi ridotti appaiono essere largamente basati su uno schema ricorrente, realizzato scavando nell'ordine: 1) un primo ampio ambiente in comunicazione con l'esterno, che sembra destinato ad accogliere la normale attività di una famiglia rurale; 2) un corto cunicolo che conduce ad una camera più interna; 3) la camera interna (il ridotto), il cui ingresso è difeso (contro l'esterno) da una porta-macina; 4) un ulteriore lungo cunicolo che dal ridotto raggiunge direttamente l'esterno (via di fuga), difeso anch'esso con una porta-macina. Tali unità elementari sono infine, in genere, mutualmente collegate da un ulteriore cunicolo, anch'esso difeso da opportune porte-macina. Viene illustrato in particolare il caso del sistema G2 che risulta di più facile lettura (cfr. figg. 4 e 6).

1. Introduction

Evidences for extended underground systems dug in ancient time in the soft rocks of Cappadocia and further abandoned in an unknown time are a well recognized feature of that region.

"Underground towns" like the ones of Derinkuyu or Kaymakli have become a well promoted tourist attraction, with their intricate and fascinating network of corridors protected by heavy millstone doors and connecting an impressive and unexpected sequence of rooms extending well down the flat surface of the area.

However, the study of similar structures is still in a very early phase and no detailed investigations of these hypogea have been till now reported in the literature. On that matter we have still to rely on the pioneering papers by Martin Urban (1973, 1975) who drove for the first time the attention on the argument, discussing these evidences only on very general grounds.

However, subterranean towns are still waiting not only for exhaustive archaeological excavations but even for detailed topographical surveys, which of course should be the first step in any attempt of a deep understanding the role of such underground systems.

Nor we have firm conclusions about their ages. As a matter of fact, digging the soft tuffs covering the Cappadocia has been a popular activity till present times, and the region is scattered by excavations of various ages and devoted to several purposes: rocky houses, pigeon houses, storehouses and so on. Indubitably, a large amount of these works has to be attributed to the Byzantine epoch, as witnessed by the impressive amount of Byzantine churches excavated in the rocks , which represent a well known and well studied patrimony of Cappadocia since the fundamental investigation presented in "*Une nouvelle province de l'art Byzantin. Les églises rupestres de Cappadoce.*" (Paris 1925- 1942) by G. de Jerphanion. Customarily, the undergrounds towns are attributed to this last epoch, though no detailed investigations have been presented on that matter.

However, suggestions have been advanced for dating the structures with millstone doors as early as the Phrygian periods (Urban 1973), i.e., as early as the end of the second millennium B.C.. One can only say that whereas the rocky churches are well placed in time, we still lack of records concerning the towns with their defensive millstones, and the attribution to the Byzantine epoch is perhaps probable, but not definitive.

As an important and no widely recognized point, one has to notice that even a simple inspection of the territory surrounding these "underground towns" easily reveals that such towns are in the reality only a particular evidence of a much more extended network of ancient excavations scattered all along the territory.

Here and there in the fields and, in particular, along the slopes of the hills one finds openings driving to more or less extended and more or less preserved abandoned subterranean rooms.

In all cases, the occurrence of millstones doors protecting the interior can be taken as an evidence of ancient works, reasonably to be related to the same diggers at the origin of the underground towns. In particular, one often finds a large amount of cavities crowding at the basis of the vertical cliffs delimiting the basaltic shields emerging from the tufaceous plane to form the series of buttes which characterize a large portion of the landscape of central Cappadocia.

Similar evidences having brought to the light in a preliminary inspection performed in 1991 by members of the "Commissione Nazionale Cavità Artificiali" (CNCA) of the Società Speleologica Italiana, since 1992 a series of mission has been devoted to this problem as organized for CNCA by R.Bixio

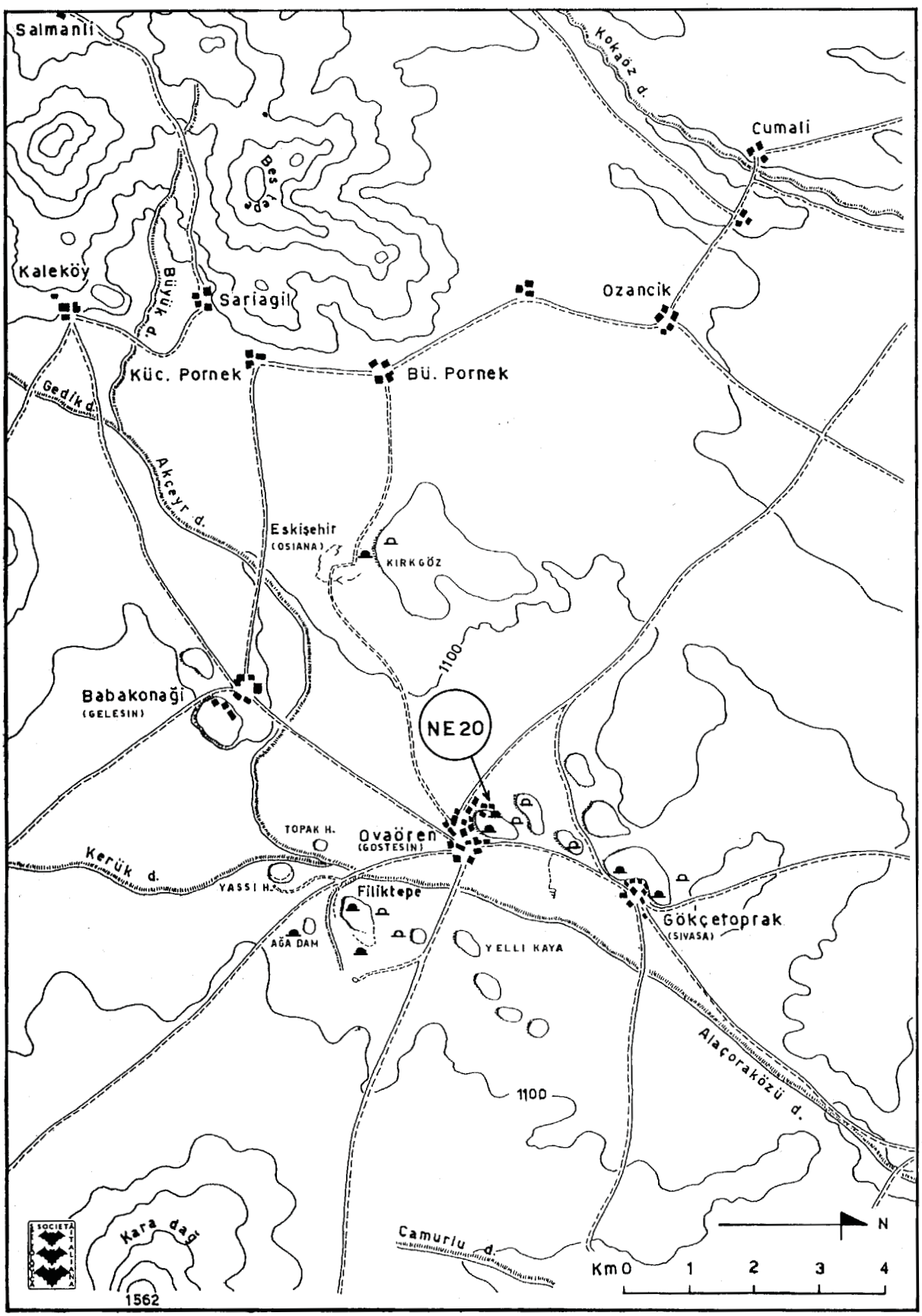

Fig. 1

The location of Ovaören (Göstesin) Village, in the Gülsehir disctrict, Nevsehir province (Central Cappadocia)

Ubicazione del villaggio di Ovaören (Göstesin), nel distretto di Gülsehir, provincia di Nevsehir (Cappadocia centrale)

with the permission and under the authority of the Turkish Ministry for Culture.

The missions were mainly devoted to reach a knowledge as complete as possible of the extension of the phenomenon in the region and, in the same time, to investigate in more details a selected sample of underground structures, producing a topographic survey of the cavities.

In the following we will report and discuss the results concerning one system out of this sample, namely the underground systems NE 20 near the modern village of Ovaören, district of Gülsheir (Fig.1).

2. The system of Ovaören/Göstesin

To familiarize with some toponomy peculiarities of the region, one has to remember that till relatively recent times the area was inhabited by a population of mixed origins, as a consequence of the arrival around the beginning of this millennium of Turkish people into this originally Greek speaking Byzantine region. Only in 1922, after the agreement for the exchange of population between Greece and Turkey the Greek language has definitely disappeared from the area. This explain the large survival of Grecian toponomy in the region, a processes which is still far to be complete and that appears accelerating just at the present times. Whereas the main towns in the area already hold their new Turkish name (e.g., Gülsheir = Zoropassos) many small villages still hold or only recently have changed their original names, which are widely used in the common language. Among many others, this is the case for the village of Göstesin, about 30 miles SW of Gülsheir, which only some years ago changed its name in Ovaören.

The village lies near the southern limit of a rocky plateau. Small rectangular modern houses are scattered around the mosque, just at the foots of the butte which emerges by about 20 m above the surrounding plane. Scattered among the modern houses one finds the remains of ancient abandoned houses, characterized by an inner structure based on a series of pointed arches made up from square blocks of basaltic rock. This inner structure was surrounded by boxy walls and finally covered by loose soil, to produce what appear as semi-subterranean rooms.

The upper surface of the butte is formed by a layer of hard basaltic rock, a few meters deep. Below, the body of the butte is formed by softer tuffs, easy to dig. All along the cliff, a series of openings at the level of the plain is driving into rather large, abandoned rooms, partly occupied by soil and partly destroyed by rock collapses. Large niches along the internal walls suggest to be used to store something and/or to feed domestic animals; rocky rings derived at various heights on the walls again suggest to be used -at least in part- to hold domestic animals. Inspections of these rooms revealed the presence of small cuniculi driving toward the interior, protected by millstone doors. According to such an evidence, we decided to give a detailed survey of the interior systems, in the aim of deriving information about the structure and, possibly, about the destination of these underground works. A partial account for this investigation has been already presented (Castellani V. and Castellani M.1993). Here we will resume and discuss all the evidences recovered during the investigation.

Fig. 2 gives a general overview of the underground network surveyed during the investigation. The network has been divided in five systems, marked G1 to G5, where a system is defined as a group of interconnected cavities. By looking at the figure one finds that the system of cavities mainly develops along the E-S-W portion of the cliff, with an evident lack of interventions along the scarp facing more or less directly to the North. Interesting enough, one finds that a similar distribution is also shown by the houses of the modern village. As we will discuss later on, such a similarity in the distribution can simply be the result of similar environmental constraints, but it could also be a consequence of a continuity of inhabitation from the underground (and pointed arches?) period and the modern village.

The same Fig.2 reveals the occurrence in many systems of three kinds of characteristic structures, namely: i) large and complex rooms in connection with the exterior, ii) internal rooms defended by millstone doors and, iii) cuniculi, sometime connecting different blocks of rooms. As a first point, even a quick inspection of Fig.2 convincingly demonstrates that the structure of the Göstesin undergrounds is quite different from the well known subterranean towns studied till now. We are not in presence of a crowding of underground rooms able to contain hundreds if not thousands of people. On the contrary we are facing the evidence for a few, small but well defended rooms that can indubitably be regarded as a system of underground redoubts.

Fig. 3, 4 and 5 give detailed maps of the single systems. Before discussing these maps let us recall two relevant points. The first one is that the structure of a millstone door (Fig. 6) is so that the millstone can be operated only from one side, and thus the door is defending that side against the opposite side. Such an evidence has to be taken into account to achieve relevant information about the role of the doors and the overall strategy of the system. As a

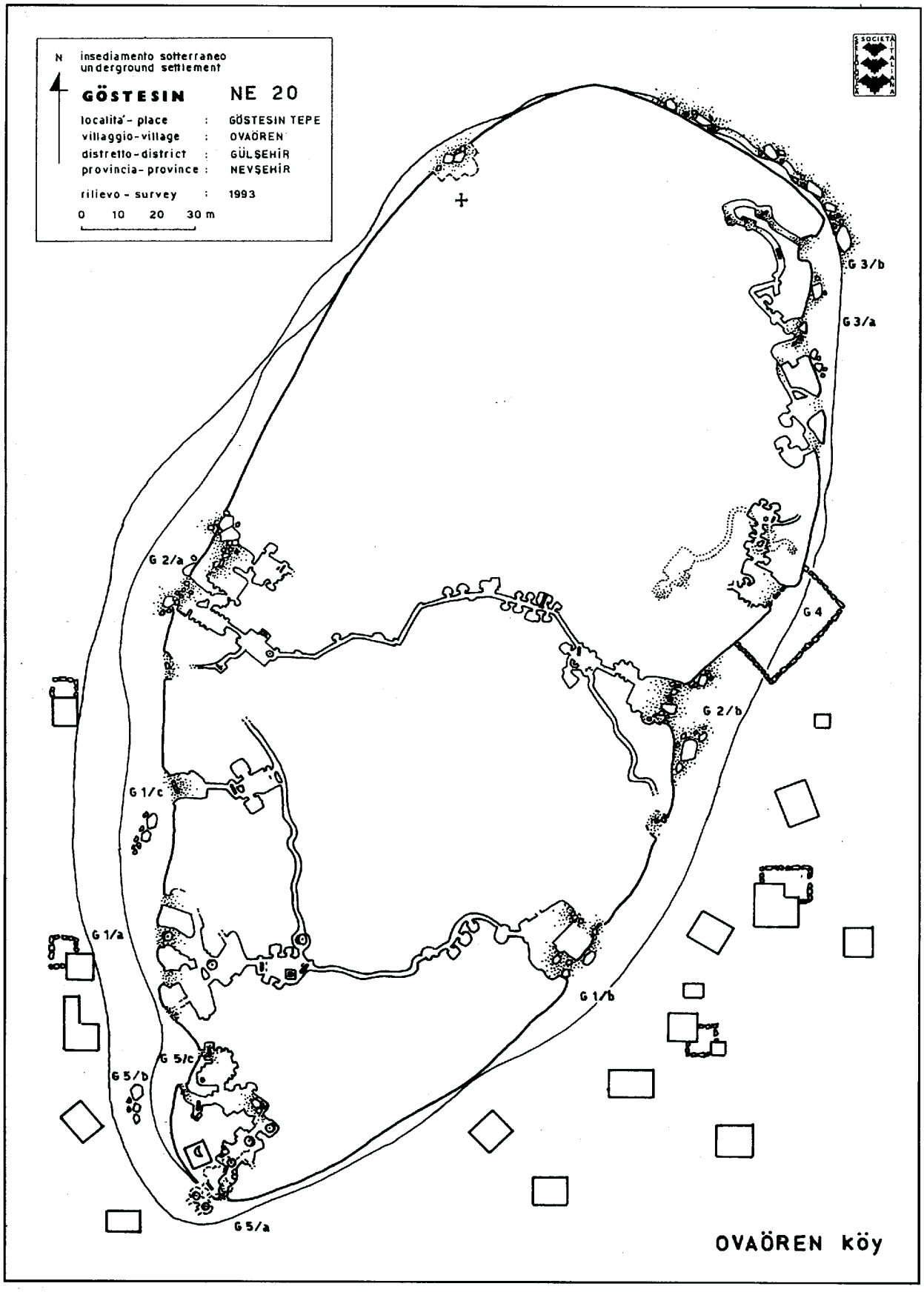

Fig. 2
A general underground overview of the Göstesin butte
Vista d'insieme dell'insediamento sotterraneo nel butte (collina piatta con fianchi ripidi) di Göstesin

second point, one has to notice that inspection of the cuniculi often give clear indication about the working direction, which can be derived from the digging marks along the walls and the roof of the cuniculi. As we will see, on this basis one can obtain relevant information about the temporal sequence of the works and, in turn, on the "logic" of the systems.

For the sake of simplicity, let us start discussing the system G2, which appears well extended but rather simple and thus of easier "lecture". By looking at Fig.4, one finds that the system appears formed by two rather identical subsystems, we will name "unities", placed at the opposite sides of the butte and connected by a long cuniculus. The elements of these unities can be listed as follow:

I) a large room in connection with the exterior, with several large niches on the walls and rocky rings. As a whole, one derives the feeling that this room should have been devoted to receive the normal activity of a rural family, with its stores of foods and with its domestic animals,

II) a short cuniculus, of the order of 10 m or less, leading to an internal room,

III) an internal room with dimensions of the order of 50 square meters,about 1.8 m high, defended with a millstone against people ingressing from the previous cuniculus,

IV) a cuniculus connecting the internal room with the exterior, defended with millstones against the exterior,

V) a long cuniculus connecting the two unities across the butte, defended with millstones against the opposite unity.

All these five elements are in common to both the unities, and thus can be taken as a definition of the unities. By adding the information on the working direction, one can sketch the structure of the unity as presented in Fig.7. On this basis one can start to advance some considerations.

There is no doubt that the basic unity appears to be formed by a normal living room, the room connected with the exterior, with the added facility of a fortified shelter in the interior. The first question is thus: why a living room dug into the tuff? The answer appear not difficult when one takes into account the characteristic of the region. Central Cappadocia is a volcanic plane more than 1,000 m above the sea level, which thus suffers very rigid winter temperatures. From a statistic over the last 20 years it appears that during the winter rarely the tem-

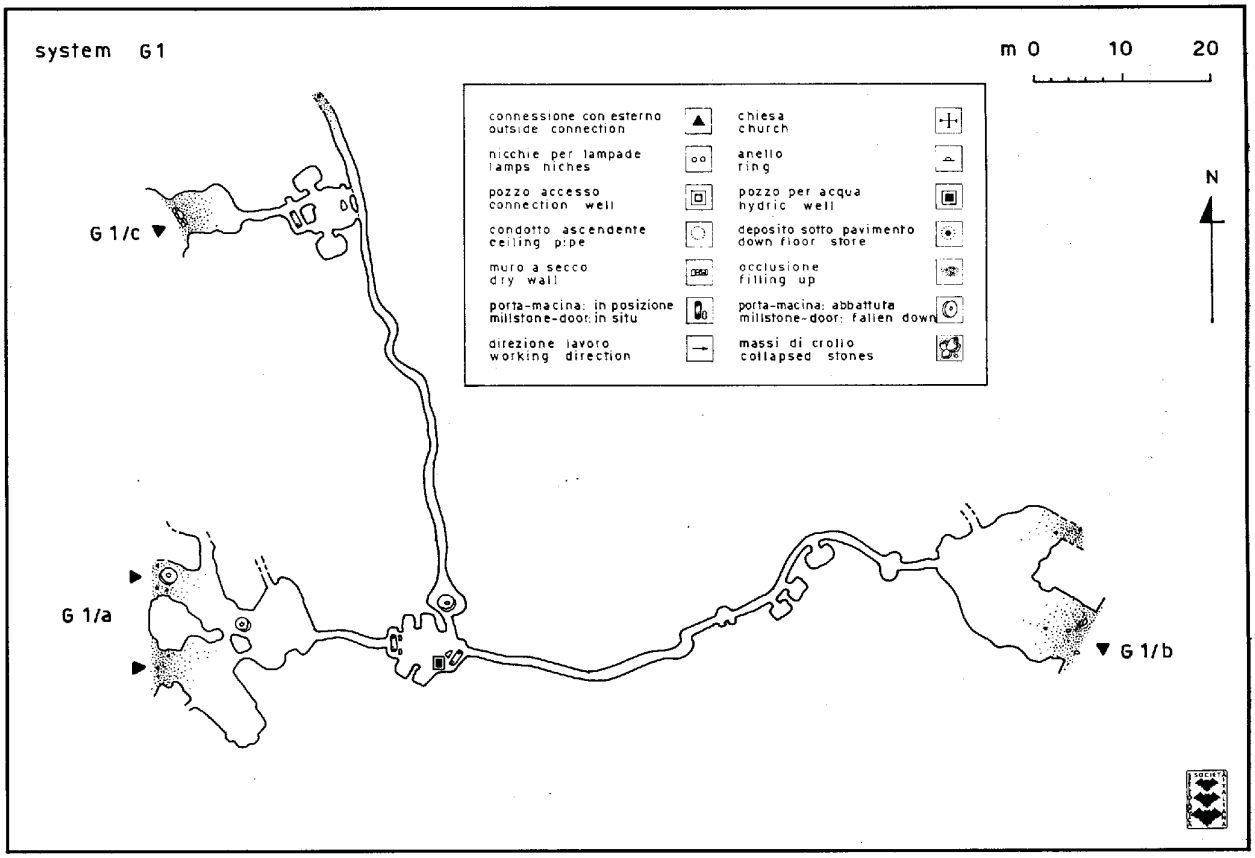

Fig. 3
Map of the system "G 1" - *Pianta del sistema "G 1"*

perature goes above 0 degree (Celsius), having reached a minimum as low as -23 degree in February 1976. How to survive during similar cold winters and, in particular, how to succeed in preserving domestic animals? The easier answer is just what one has under his eyes: taking advantage of the easy-to-dig rocks, one can prepare subterranean refuges, where the microclima is largely decoupled from the external temperatures and it is not too difficult to maintain an acceptable environment. Note that similar arguments can account for the evidences for semi-subterranean houses quoted before.

Thus the use of underground rooms could be regarded as a natural response to the local climate, the only one allowing the installation on the place of rural communities. Or, at the least, the most direct and economic way to cope with the local climate.

However, such an evidence raises another question: why and how the ancient Hittite towns, spread all around Cappadocia, seems having be able to survive without such an easy trick? A different climate? Or, maybe, a difference between the rural communities and the town communities? We can only leave that question open to further investigations and/or comments.

No doubt, the internal room appears like a refuge or, better, a subterranean bunker devoted to receive not only humans but also domestic animals. A redoubt whose defense has been carefully planned according to an experienced strategy. The short tunnel leading to this room is not only stopped by a millstone door but, in particular, it appears in both unities narrow (of the order of 80 cm) and not higher than about 140/150 cm, thus clearly and deliberately lower than the following room. The reason for such a feature is easily understood when considering that an aggressive man forced to stay bowed into the cuniculus, without the capability of freely handling arms or any other offensive object is constrained to remain practically defenseless in front of the loophole at the center of the door and thus against the offense produced through this hole even with a simple lance. Taking into account that the cuniculus is obviously forcing an offensive group to queuing one by one in front of the door, it is easily understood that the system is in principle able to indefinitely stop the aggression of even numerous adverse assailants.

In spite of such an efficient defense, it appears that the internal room, after its completion, was provided with a cuniculus leading directly to the

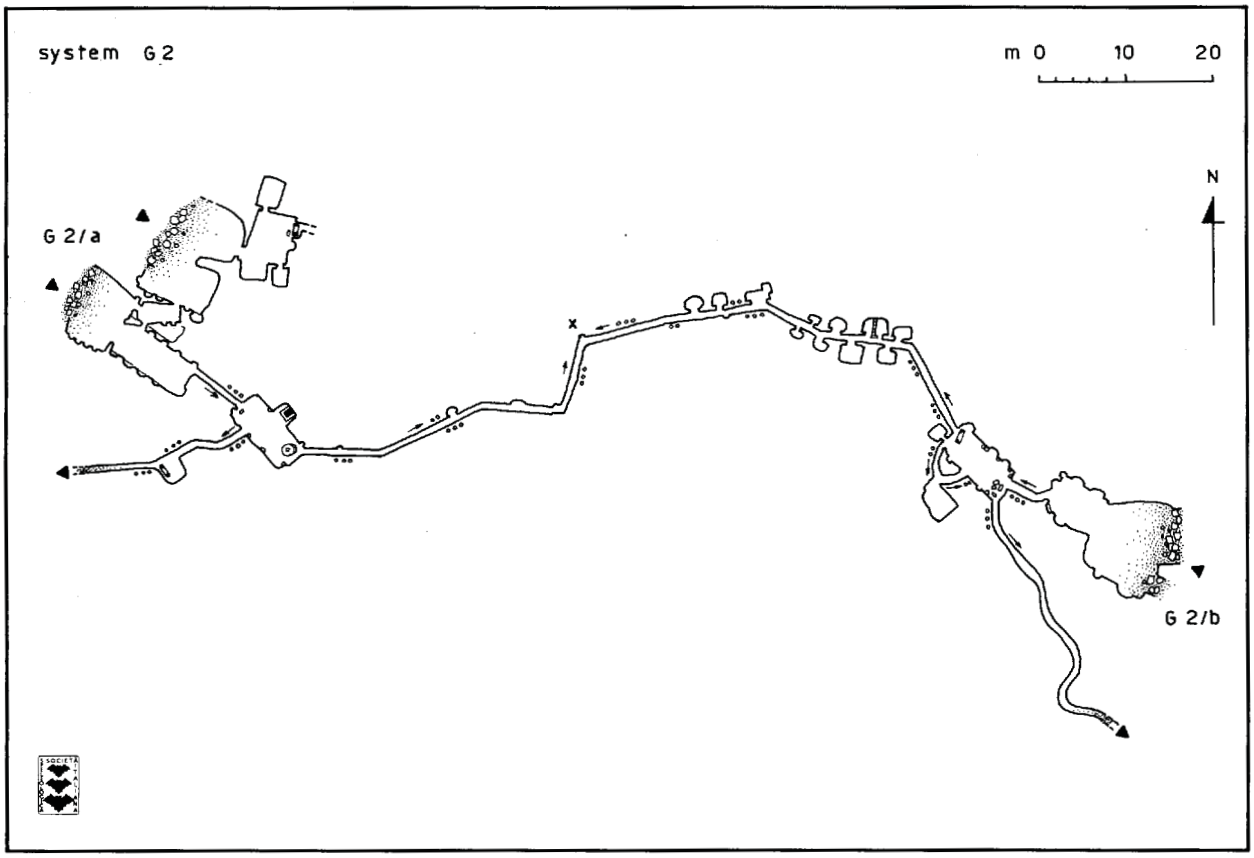

Fig. 4
Map of the system "G 2" - *Pianta del sistema "G 2"*

exterior, defended by a further millstone. These long cuniculi are even smaller than the previous cuniculus connecting the external with the internal room. As a consequence, the cuniculi can be easily defended by a smaller millstone, placed either directly in the internal room (unity G2b) or in a "operating room" located along the cuniculus (unity G2a). The door in the internal room have the advantage of more people helping in the defense, but the drawback of allowing the enemy to reach the very proximity of the defended place before being stopped. On the contrary, the "operating room" along the cuniculus has the disadvantage of requiring continuous watch by one or two people, with the advantage of stopping the enemy well before the protected room and, if forced, to allow a second line of defense based on the cuniculus itself. One has indeed to notice that proceeding on all fours, with an oil lamp in a hand, queuing one-by-one, is not a possible way to manage an attack, and a small cuniculus is by itself an efficient line of defense, the millstones being only a further redundant protection.

According to such an evidence, one also understand that the sizes (width and height) of the cuniculus connecting the external rooms to the interior are the result of the need of optimizing two contrasting necessities, i.e., to allow an easy and quick pass to the refugees and, in the same time, to make as difficult as possible the way for the assailants.

The problem of course arises: why this second and direct connection with the exterior? This is of course matter of conjectures, to be treated with caution. The first answer coming to the mind is that we are in presence of a "way of escaping", a feature which is often present in places prepared to suffer a siege. Curiously enough, just at the border of Cappadocia one finds one among the most ancient and most enigmatic evidences for such a feature, as given by the well known "pusterls" crossing the walls of the ancient capital of the Hittites Hattusa. The aim of our "ways of escaping" could be multifold. It could of course allow the flight of the besiegeds (but no of the domestic animals). But, and in our feeling more probably, these cuniculi were devoted to allow the exit of one or more people to explore the situation, to ask for help or, maybe, back attack the assailants and so on. This being our preferred hypothesis, an alternative or additional explanation could be to help the circulation of air through the circuit of tunnels: as a matter of fact during our survey we often detected the occurrence of sensitive air flow through these tunnels.

As sketched in the same Fig. 7, the two unities have been finally connected by digging from the two internal rooms two cuniculi crossing the butte in opposite directions till reaching a final intersection point. The digging marks reveal that the intersection was reached in the point labeled "X" in Fig. 4. As shown in both figures 4 and 7, the path of these cuniculi appear rather erratic, not guided by precise constructive plans. As a matter of fact, starting from the internal rooms and without the aid of shafts reporting the underground positions on the upper surface of the plateau, it would be difficult to obtain precise information on the digging direction. However, the cuniculus from G2a starts pointing rather accurately toward the opposite unity, whereas the cuniculus from G2b starts with so a different direction to suggest that the connection was not the original aim. Only after more than 10 meters this cuniculus turns toward a direction allowing the final connection. According to all the evidences, the intersection was finally reached when the two cuniculi were near enough to allow the rock to transmit the digging noises: as discussed in Castellani & Castellani 1993, at this point the cuniculus from G2a has been abruptly turned left to reach the opposite cuniculus. As a whole, the digging technique appears rather crude, not revealing the application of the sophisticated procedures allowing the match of opposite cuniculi already applied in the VI century B.C. in Samo (i.e. not far away, on the present Turkish coast) to dig the Eupalinos tunnel (Kienast 1983). However, this is probably only the evidence that the dig has been performed by a rural community, which did not need to know or to adopt advanced techniques to cope with their rather simple task.

As a final interesting point, one has to notice that both the internal rooms have been protected from the connecting cuniculus by millstone doors. Why this connection and why the protections? On very general grounds one can answer that a system of two coupled unities gives to a besieged group more chances and more opportunities than two isolated bunkers: the defenders can share the forces according to the need and, in the case of breakdown of one unity, they could keep resisting in the second one. It appears that the millstone doors closing the connecting tunnel should have been planned to account for such a possible occurrence. However, before settling the argument, one has to notice that the two unities, beyond the already quoted similarities, do have interesting and perhaps complementary differences. G2a has scarce evidences for storing rooms but has a well, on the contrary G2b has no wells but a large amount of secondary rooms likely devoted to the storage of goods, both along

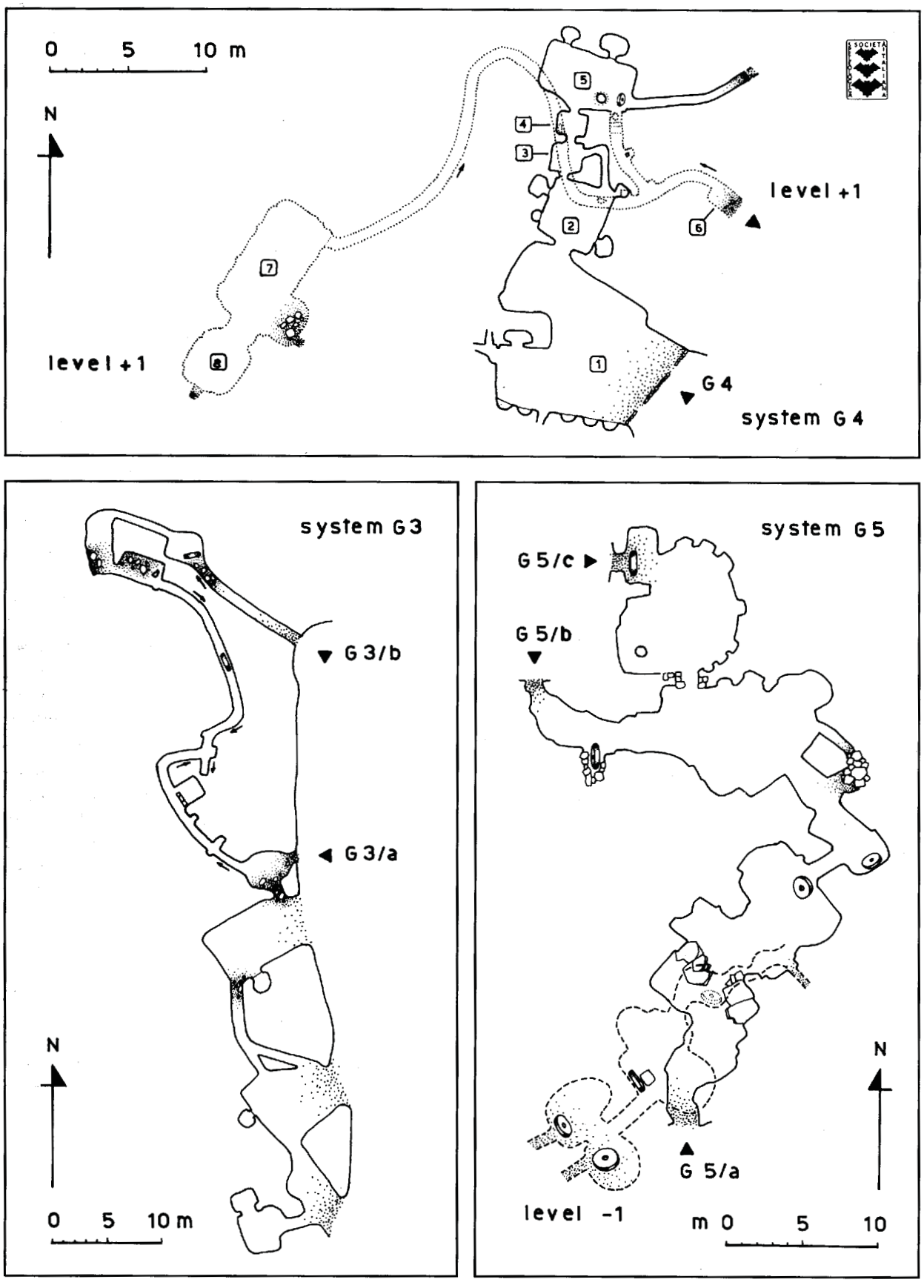

Fig.5
Maps of the systems "G 3", "G 4", "G 5" - *Piante dei sistemi "G 3", "G 4", "G 5"*

the first portion of the connecting tunnel as well as within the same internal room. Of particular interest in G2b the large room connected to the internal room by the annular cuniculus: a feature likely devoted to facilitate the traffic of people leading or taking goods to or from the storage room. Thus one is facing contradictory evidences: from one side there are strong indications that the unities are conceived as self consistent and protected rooms. Moreover, the connecting tunnel seems not having originally planned for this purpose, the connection having been realized only in a second time, taking the opportunity of the already dug portion of the G2b tunnel. In the same time the already quoted complementarity seems to indicate just the contrary. It is obviously difficult to reach firm conclusion on that matter on the basis of only the topographic investigation.

However, let us advance a possible explicatory scenario just to give an example of the various possibilities one is dealing with. The structure of the system could be understood if G2b was dug first, as a self consistent unity. G2a was thus initiated knowing the existence of G2b with its stores and with the plan of joining the two unities instead of duplicating these rooms. The well was dug in G2a perhaps taking advantage of the low depth of the water table in that place. An hypothesis to be regarded only as an exercise to put in light the existence of many unknown variables, as the history or the water table level, affecting the details of the general scenario one can extract from the topological analysis of the system.

One can now compare the previous results to the structure of other hypogea of the group. As for G1 (Fig.3), one easily recognizes that both G1a and G1c closely resemble the structural unity as defined before, with large external rooms connected by a short cuniculus to their internal room, clearly devised as a refuge protected by millstones at all the entrances. A tunnel is now connecting G1a to G1c, going further, likely toward the exterior. One can suggest that this tunnel is now fulfilling the double task of connecting two unities, offering in the same time an "escaping way". In the internal room of G1a one finds a further cuniculus which crosses the body of the butte to reach G1b, which is now formed by an external room only, lacking of the corresponding redoubt. However, in G1b one finds also a cuniculus filled by earth, not open to our investigation. We suggest that this cuniculus could lead to the internal room of G1b, so that the cuniculus crossing the butte should fulfill only the task of connecting G1a to G1b, either as a further "escaping way" or to allow a defensive network based on the three units G1a, G1b and G1c. Alternatively, one could consider the lack of internal room as an evidence that the people in G1b relied on the internal room of G1a as a common refuge for both the unities. Note that the internal room of G1a is the only one in this system having a well. As a whole, G1 and G2 appear largely based on the same "philosophy", disclosing the common function of all these systems.

A similar scheme can also be found in the lower level of the hypogeum G4. As in G2a and G2b, one finds a series of unprotected rooms, more or less directly in connection with the exterior. From the more internal of these rooms starts a short cuniculus leading to the internal room. Now we are in presence of two new features worth to be discussed. The first one is that the room leading to the cuniculus is not more a direct continuation of the previous room, but is derived on the right side of the main room so that the entrance of the cuniculus is already embedded in the dark. This could be only a fortuitous occurrence, however one could note that in such a way the entrance of the cuniculus is much less evident than in the previous location. This could be a further precaution in the attempt of not driving the attention of the assailants on the cuniculus. Much more interesting is the fact that the cuniculus leading to the internal room is no more a short straight tunnel but it turns left about at 90 degrees about 2 meters before reaching the millstone door. This is an interesting and important innovation, definitely increasing the efficiency of the millstone door. As a matter of fact, the turn off of the tunnel little affects the practicability for transferring people or good. In the same time this turn off prevents from the use of long battering-rams or similar objects against the door, nor the door can be attained by stones or arrows flung from the exterior. On the contrary the first assailant is forced to stand alone in front of the door, thus in a quite dangerous location.

This system has been successively connected with a long cuniculus overpassing the unity at an upper level and with a rather erratic behavior to reach finally the exterior. This cuniculus is part of an upper unity which has not exhaustively investigated because of filling of earth. However, several features could suggest that this unity was abandoned before completion. The same suggestion can be advanced concerning the system G3 (Fig.5), the more northern system of the butte. It consists of two cuniculi with small rooms, dug with an erratic behavior till reaching a connection. At this stage of the work, it appears rather difficult to imagine an useful meaning for this hypogeum, nor the location of the millstone doors seems devoted to protect something of valuable

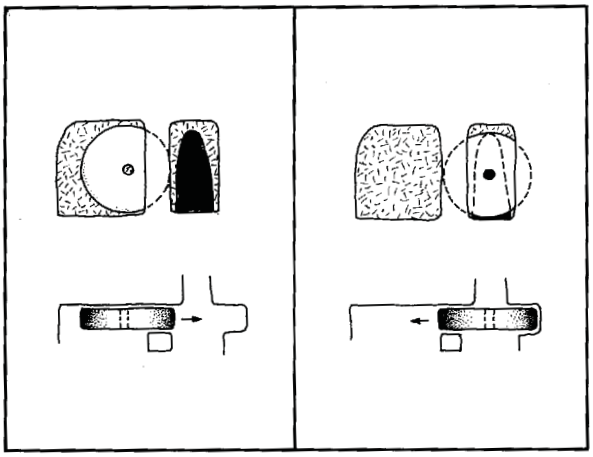

Fig. 6
. Sketch of the structure and of the operating principle of a millstone door.
Schizzo della struttura e del principio di funzionamento di una porta macina

interest. To be noted a millstone door abandoned along a cuniculus, in a place for which it is difficult to find a logical explanation, either if abandoned during the original works or if abandoned during a further sacking of the hypogeum.

At the extreme South of the butte one finally finds the system G5 (Fig.5), another hypogeum which does not allow an easy interpretation. The portion not filled by earth and open to investigation appears formed by three large rooms, all actually in communication with the exterior. A series of millstone doors is protecting the two northern rooms both from the outside and from the southern room, whereas a further millstone, if in place, seems to protect this last room from the previous. This room is also in connection with a lower level formed by a few small rooms, protected with three millstones against the South, where likely there were one or more entrances. Owing to the relevant degradation of the hypogeum it appears difficult to find indication about the use and the dug procedure.

3. Discussion

With reference to the general map already given in Fig.2, one may summarize the evidences given in the previous section as follows: South to North along the butte one finds in the order

I) the hypogeum G5, formed by rooms without a clear planning,

II) two extended systems formed by a total of 5 "unities" mutually connected to form G1 (three unities) or G2,

III) the system G4 again formed by one unity but with an upper level possibly not completed,

IV) the system G3 which could have been abandoned before a substantial completion.

This section will be mainly devoted to discuss the historical scenario one can infer from the relevant evidence given by the systems G1 and G2, whose careful planning can give light on the needs suggesting the planning itself and thus, on some characteristics of the human settlement at the origin of the hypogea.

However, before approaching this argument, let us notice - at the least as a speculation worth of further investigation- that the distribution on the ground of the various systems could be understood in terms of a temporal development of the hypogea from the South to the North of the hill. According to such an hypothesis, the first human settling producing hypogea was placed just at the South corner of the butte, and at that time G5 was dug. We have no idea if these hypogea were really housing the human group or, rather, they are only additional rooms for the domestic animals, though we are inclined toward the first solution for the climatic reasons told before. We suspect that these hypogea were dug before the need for a protection become evident, and that the existing millstones are only the result of a following adaptation to this need. This because the lack of cuniculi, which appears the most obvious and most simple protective procedure. Note that the location of the original settling to the South is not only suggested by our topological approach but obeys a much more general opportunity. As a matter of fact, bearing in mind the meteorological conditions recalled before and, in particular, the extreme rigidity of the winters, it appears obvious that the southern side of the cliff is the best location being the only one enjoying solar irradiation for the whole day. As a confirmation, one finds that not only in our butte, but in all the other buttes in the region, the hypogea, when present, are clearly grouped around the South extremity of the butte, the Northern uninhabitable side lacking in all case in hypogea (Bixio, private communication). In this context, it may be interesting to notice that even at present time the mosque, which represent the center of the modern village, is located just on the southern corner of the butte, right in connection with the system G5, as shown in the previous Fig.2.

According to such an hypothesis, only in a second phase the settling was fortified and developed with the excavation of the hypogea G1, G2 and G4 and the system was still growing with G3 when something happened, the work in G3 were interrupted and, probably, the whole fortress (as the butte was at that time) was abandoned or collapsed. We cannot have clear indication of what happened. However,

in the undergrounds we find several features one could take as an indication that the hypogea were finally forced by unknown assailants. In particular one finds that the great majority of the millstones is in its closing location, and that they have been forced and inclined toward the interior. Of course, one has to take into account that the hypogea remained open to pillage for centuries: however one may notice that in a normal situation it would be much easier to operate the door into its open position even from the external side rather than forcing the millstone to incline away. Moreover, in one case (the internal room of G2b) one finds a millstone broken in several pieces, an occurrence which requires a great deal of efforts and the use of some instrument like a ram, an occurrence difficult to reconcile with the quite pillage of an abandoned hypogeum. One can finally notice that similar evidences have been found in other hypogea in the region and, in particular, in the near hypogeum of Filiktepe.

Coming back to our main argument, there is no doubt that the subterranean structure of the main systems is devoted to defend small group of humans with their crops and their domestic animals from an external attack. This tell us of rural communities, organized in small groups, likely on familiar basis, submitted for a long time to a continuous danger of pillages from something like bands of robbers. The adopted kind of defense would be indeed useless against a large amount of enemies occupying permanently or for a long time the territory. This because the defenders could not survive indefinitely in the hypogeum, even if the occurrence of wells indicates that rather long stages were foreseen and prepared.

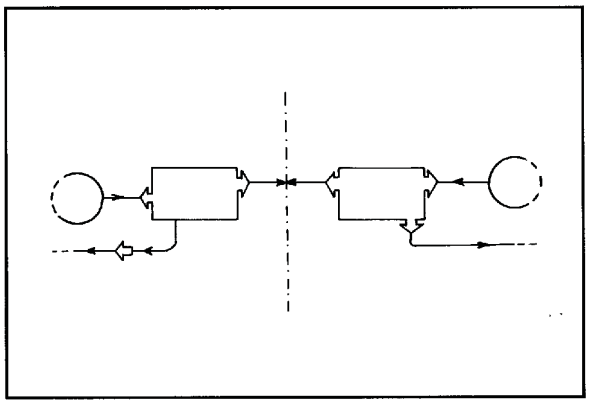

Fig. 7
Sketch of the composition and of the mutual position of the two basic "unities" of the system "G2". Thick arrow lines represent cuniculi with their digging direction. Open wide arrows represent millstone doors: arrows are pointed toward the portion of cuniculus closed and controlled by the door.
Schizzo della struttura e della reciproca posizione delle due "unità" di base del sistema "G 2". Le linee con le frecce piene, rappresentano i cunicoli e la loro direzione di scavo. Le grandi frecce aperte corrispondono alle porte-macina: la punta indica la parte del cunicolo chiusa e controllata dalla porta.

The problem is thus who and when in the region was historically in a similar situation? To our knowledge, there are two times fulfilling such a scenario. The first one is in very ancient time, when the Hittite empire collapsed in a series of small kingdoms, in everlasting fight against the nearby kingdoms as well as against the Phrygian invaders. It may appear curious to go back so a long time; however the region bear clear witness of these and even older times. Just in the field surrounding Göstesin Tepe one finds a tumulus formed by the rest of a neolithic village and, at the side, the huge rest of a Phrygian settling. A Hittite stele on the rocks of a nearby tepe (Sivasa) bears the memory of the settling of Hittites on the territory. Thus one cannot exclude a priori a similar ancient origin of the hipogea.

However a much more convincing concordance can be find at the time when the Byzantine emperor Eusebius reconquered the Cappadocia and tried to stabilize the Byzantine power in the region. To this purpose, this emperor introduced the so called "thema", namely, the figure of soldier-farmers, giving the propriety of the farms to people who committed itself and his descendant to defend the territory with the arms. As a matter of fact, these soldier farms were indeed able to defend for a long time the territory from the raids of the Arabian bands, until the final arrive of the Turkish people. One finds that a similar historical scenario completely overlap the evidences given by the hypogea, strongly supporting a Byzantine origin for our underground systems. However, curiously enough no remains of these period can be found in the cavities: neither potteries nor marks on the wall maybe testifying the religious piety of this people. This is an enigmatic feature which would deserve some explanation we are not able to attain.

As an independent approach to the problem of age, one could try to place the evidence for the characteristic technique of millstone door into an historical context. However, one obtains no definitive answers. Evidence for millstone doors have been reported in the Orient. Near Cappadocia, millstone doors have been found in Palestine in a Roman tomb of the first century. On this basis it is difficult to drive any conclusion, since Cappadocian millstones are in all cases very far in time, about a millennium after (or before) the Palestinian tomb. As a last point, let us notice that this technique of rolling doors was not

adopted in similar condition by the Byzantine people who for a rather long time survived into the Eupalinos famous tunnel of the isle of Samo to the Turkish invasion (Kienast 1992). It may be the strategic situation was different, it may be that the technique did not reach the western coast of Anatolia. One may conclude that, as usual, approaching a new field of investigation, as we did with our missions in Cappadocia, give a valuable amount of new evidences producing in the same time a correspondingly large number of open questions which will require further and further investigation before attaining firm conclusions about the historical and sociological scenario one is dealing with.

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