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# The Rupe Tarpea: the role of the geology in one of the most important monuments of Rome

## *La Rupe Tarpea: il ruolo della geologia in uno dei più importanti monumenti di Roma*

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ABSTRACT – The Rupe Tarpea is one of the most significant monuments of the Roman time. The Campidoglio is built up on this cliff. The legend says that during the wars of the Romans against the Sabins (IV-III centuries BC), a young lady named Tarpea, while Roman soldiers were sleeping, opened the city doors to the enemy who could enter undisturbed. When the Romans, made save the city, knew about the betrayal, killed the girl pushing her down from the cliff. Since that time, the cliff was named Tarpea. The Rupe Tarpea itself records the geological evolution of the area: it is constituted by ignimbrite deposits erupted from the Colli Albani volcano, immediately south of Roma. Erosion processes during quiescence periods of the volcano and after the end of the volcanic activity, are responsible for the dissection of the ignimbrite plateau forming the rupe and the famous seven hills of Roma. In this study, we indicate the need to include the Rupe Tarpea in global sites of geological interest to promote a discerning for a different type of tourism which basically takes into account people's culture. The Romans, in fact, recognize the Rupe as part of their cultural heritage.

KEY WORDS: Cultural heritage, Geosite, Rome, Capitoline Hill.

RIASSUNTO – La Rupe Tarpea è uno dei più significativi monumenti del periodo Romano e il Campidoglio sorge su questa rupe. La legenda racconta che durante le guerre dei Romani contro i Sabini (IV-III secolo a.C.), una giovane donna di nome Tarpea, mentre i soldati romani stavano riposando, aprì le porte della città al nemico che poté entrare indisturbato. Quando il tradimento fu scoperto i Romani scaraventarono la fanciulla giù dalla rupe che da allora portò il suo nome. Da un punto di vista geologico la Rupe Tarpea registra l'evoluzione geologica dell'area: è costituita da depositi ignimbritici del vulcano dei Colli Albani, immediatamente a sud di Roma. I processi erosivi attivi nei periodi di quiescenza del vulcano e alla fine dell'attività vulcanica sono responsabili dell'incisione del plateau ignimbritico e della formazione dei sette famosi colli romani. Nel presente studio, è stata evidenziata la necessità di includere la Rupe Tarpea nei siti mondiali di interesse geologico al fine di favorire una distinzione per un diverso tipo di turismo che essenzialmente tenga in considerazione la cultura. I romani infatti riconoscono la Rupe Tarpea come parte del loro patrimonio culturale.

PAROLE CHIAVE: Patrimonio culturale, Geositi, Roma, Colle Capitolino.

## 1. – INTRODUCTION

Landscape is a sort of natural archive that shows the route of the natural evolution of the territory. The ability to read it is a useful tool to understand how to use our land and to live with harmony without destruction and degradation. Landforms often provide continuity, in term of processes, between the distant and recent past and present (WIMBLEDON *et alii,* 1999). The Rupe Tarpea represents an important archive including both the key to read the evolution of the roman territory and the primordial legend of the birth of the Urbe (ARNOLDUS HUYZEDVELD *et alii*, 1997a,b).

The history of Roma, in fact, for many aspects, is strictly connected to the presence of the Rupe.

The Rupe is the most southern cliff of the Capitol Hill (Capitoline) which dominates westward the alluvial plain of the Tiber River, in the point

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where the Isola Tiberina (Tiber's island) is almost at the centre of the river valley (fig. 1). Landscape was an important factor inducing Romans to develop on this hill the political and social life of the new city. The steep limit of the cliff allowed an easy defence, whereas the proximity to the other six small hills (Palatine, Viminal, Quirinal, Aventine, Celian and Esquiline) facilitated the continuity of the business in the hinterland. The presence of the Isola Tiberina was critical, and from the Capitol Hill the control of the mercantile business was very easy. Marketplaces and small urban areas developed on the hill very soon.

It was an ideal position and a lucky landscape, but also a large quantity of natural resources due to the geological characteristics of the territory: the Capitol Hill, as the others roman hills, is made of volcanic rocks mainly deposited by the explosive activity of the Alban Hills volcano, few kilometres southeast of Roma. They are made of pyroclastic flow deposits that, being the deposit of topographically controlled median or large volume ignimbrites, originated the flat topography (plateau) of the roman land. Fluvial erosion, particularly active close to the river Tiber delta, dissected the plateau forming the famous seven hills (fig. 1, 5b). Details of this history will be given in the next paragraph. The deposits of the Alban Hills ignimbrites show special lithification, besides to be heavy and porous, which made them easy to work.

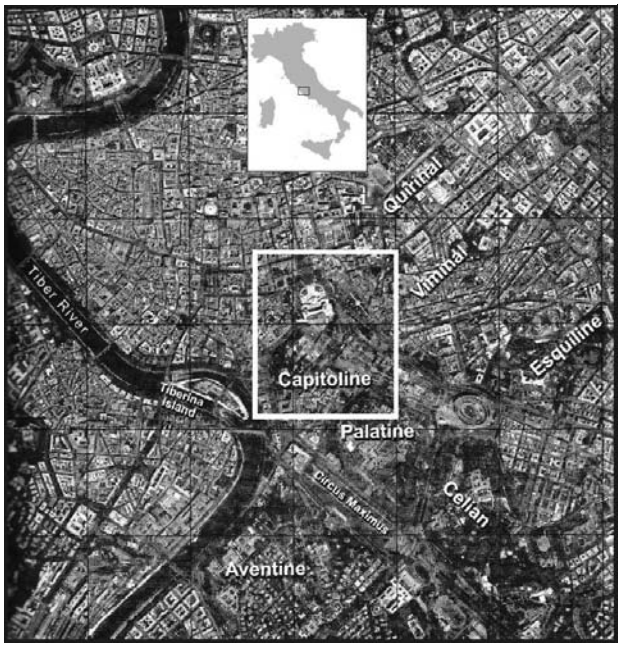


Fig. 1 – Aerial photograph of central Rome. White square indicates the location of the Capitol Hill (Capitoline). The Rupe Tarpea is the most southern cliff of the Capitol Hill (Capitoline) which dominates westward the alluvial plain of the Tiber River, in the point where the Isola Tiberina (Tiber's island) is almost at the centre of the river valley. The "seven hills" are visible, including the Quirinal, Viminal, Aventine, Esquiline, Celian, Palatine and the Capitoline. All these hills are erosion segments of a wide volcanic plateau. On the left, the flat floodplain of the Tiber and several of its meanders are recognizable.

*– Fotografia aerea del centro di Roma. Il quadrato bianco indica l'ubicazione del Colle Capitolino. La Rupe Tarpea è il colle più a sud del Capitolino che domina verso ovest la pianura alluvionale del Fiume Tevere, nel punto dove l'Isola Tiberina è al centro della valle fluviale. Sono ben visibili anche i sette colli, Quirinale, Viminale, Aventino, Esquilino, Celio, Palatino e Campidoglio. Tutti questi colli sono il risultato dell'erosione che ha interessato il vasto plateau vulcanico. A sinistra nell'immagine è ben riconoscibile la pianura alluvionale del Tevere e svariati meandri.*

They are good building materials and, in fact, were largely used by Romans to build up their houses (De Rita & Giampaolo, 2005). Even today it is still possible to see the scratched marks on the cliff made by the tools of the quarrymen.

Ignimbrites deposits, which are permeable, lie on impermeable clay sediments due to the Tiber floodings, creating ideal conditions for the development of local aquifers feeding several small but fresh and clean springs. These springs guaranteed the hydric resource for the city (Corazza, 1999; Heiken *et alii*, 2005).

Finally, the roman volcanic deposits are particularly enriched of Si, Na and K, enormously enriching local soils. All these advantages caused the fate of Roma: they contributed to make Roma, between all the developing cities, the most important and powerful city of the known world.

The long and fascinating history of the Capitol Hill and of the Rupe Tarpea could only be possible for the geological nature of the territory that makes them so special. In this note, illustrating as the history and the legends of the Rupe Tarpea are strictly dependent by the geology of the roman area, we want to suggest to consider the Rupe Tarpea is an important urban geosite: in the symbol of the cliff, the geological and morphological characteristics of the roman territory are harmoniously blended with the reasons of the legends and with the history of the Roman people.

## 2. – HISTORY AND LEGENDS OF THE CAPITOL HILL AND OF THE RUPE TARPEA

The Capitol Hill is the smallest of Rome's seven hills but it was and still is the most important. It has been considered the religious and political centre of the city since its foundation more than 2500 years ago. Even today it is considered the navel of Roma: in fact, all distances from and to Roma, as an example, are calculated starting from it.

Several important temples were built on the Capitol Hill: the Temple of Juno Moneta, the Temple of Virtus and the Temple of Jupiter Optimus Maximus Capitolinus, this latter considered the most important temple in ancient Rome. The latter was built in 509 B.C. and was almost as large as the Parthenon in "Athens". With the edification of these

buildings the Capitol Hill became, besides that political, the most significant religious site of the city. Later on, in 79 B.C., on the hill was built the Tabularium, used as the empire's main archive. The hill, and the temple of Jupiter in particular were the symbols of Rome as Caput Mundi, capital of the world. Even after the decline of the Emperor capitol, during the Medieval Age, when the Capitol Hill was the site for the cattle fair, Romans considered the hill the Augustus Hill, the symbol of the Romanity. When in 1143, the Roman people rose up against the Pope, the Capitol Hill became the site of the new municipality and the Romans had there their political and social assemblies (meetings). It is a matter of fact that just above the ruins of the Tabularium the Senate building was built up. After a long period of crisis, in 1538, Pope Paolo III committed Michelangelo the project to restore the Campidoglio square. The new project was scheduled to be as the first step to locate at the centre of the square the Marco Aurelio equestrian statue. To realize the new square a huge quantity of material was used to soil the Asylum, the topographic low separating the two small hill tops of Capitol Hill: the Arch to the north, where is presently the S.Maria d'Aracoeli church, and the Capitolium to the south.

Such a special site could only be a symbol and in fact the Rupe Tarpea is widely considered the symbol of the Romanity. Several ancient legends refer to the Rupe Tarpea. The name itself comes from an ancient fascinating history. Tarpea is the name of a legendary young woman, daughter of Tarpeo defender of the Capitol Hill. She loved the Sabins' king, but at that time there was the war between the Sabins and the Romans. The legend tells that after Roma was built up (VII century B.C.), Romans realized they needed women to originate their progeny. They organized a big party inviting the Sabins, their neighbours. Taking advantage because of the Sabins distraction, Romans kidnapped those women which were close to in the buildings of the Capitol Hill. One night the Sabins' king convinced Tarpea to open the doors of the Capitol. When the Romans knew about her betrayal, she was immediately executed by being thrown down from this same cliff. The hill was since then called Rupe Tarpea (Tarpeian Rock). Since that moment any traitor suffered the same treatment in the same place.

The suggestion of this history is so strong to last up to us and to inspire several tragedies: among them we can remember the tragedy of Cristoph Kuffiner for which Beethoven orchestrated the Triumphal March.

The Capitol Hill falls back again into a well known legend related to the famous Capitol gooses that, in 390 B.C., awaked the Romans with their calls avoiding the Gauls invasion.

## 3. – GEOLOGICAL EVOLUTION OF THE ROMAN AREA

The geological history of the Capitol Hill is very long. It started almost one million years ago (Lower-Middle Pleistocene) when the roman area was subjected to a regional uplift, emerging from the sea. The clay and sandy-clay sediments constituting the bedrock of the area are the marks of that period during which the roman area was occupied by the sea. Monte Vaticano Formation made of Pliocene blue clays overlaid in succession by the Formations of Monte Mario and Monte delle Piche (etheropic to Monte Ciocci) Formations, from Lower to Middle Pleistocene (Funiciello & Giordano, 2005). These formations are made of sandy sediments which show shallower sea water, suggesting the uprising of the area.

These deposits are still visible in the highest portion of the roman area (Monte Mario, Gianicolo). On the young land, the erosion processes immediately started, determining the organization of a fluvial drainage network (De Rita *et alii*, 1992). The presence of pebbles and sandy-clay sediments of fluvial environment locally present on the Pliocene clays, makes possible to reconstruct the course of an ancient Tiber river (Paleotiber) that organized its valley in proximity of the Apennine chain and had its delta in the Ponte Galeria area (Ponte Galeria Formation; Milli, 1997; Marra & Rosa, 1995; figure 2a). Between 0.7-0.6 Ma, this area was subjected to an important extensional tectonic phase which caused the uplifting of the NW oriented Monte Mario ridge (Giordano *et alii*, 2003; De Rita *et alii,* 2004). The Monte Mario ridge together with the pre-existing Pomezia rise created a topographic barrier that forced the Paleotiber River to move its course eastward, and its delta in that period moved near the present Anzio village (fig. 2b). At the same time, the area was interested by volcanic events. Two important volcanic districts, the Sabatini volcanic District, almost 20 km NE of the present Roma, and the Colli Albani volcanic District less than 20 km SE (fig. 2c), started their activity mainly characterized by violent explosions of ignimbrites and fall of pyroclastics covering the area with a thickness of several hundred of meters. The first explosions from the Colli Albani volcanic District were particularly important for the geological character of the area. In fact, the very huge quantity of water

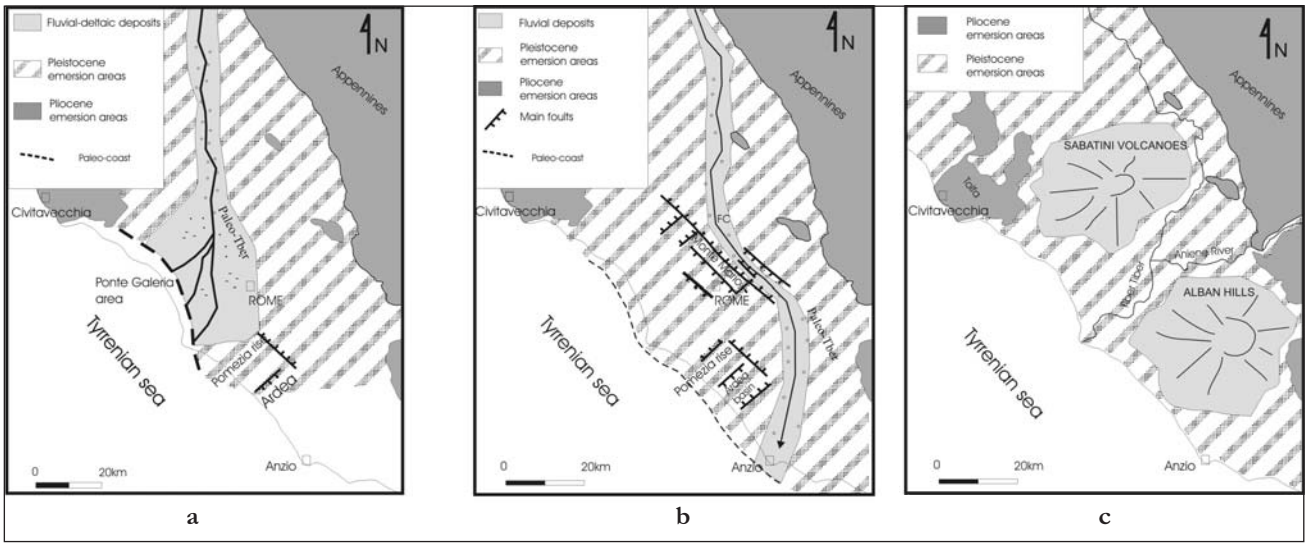


Fig. 2 – Geological evolution of the Roman area. a) One million years ago (Lower-Middle Pleistocene) the roman area was subjected to a regional uplift, emerging from the sea. On the young land, the erosion processes immediately started, determining the organization of a fluvial drainage network. An ancient Tiber river (Paleotiber) organized its valley in proximity of the Apennine chain and had its delta in the Ponte Galeria area. b) Between 0.7-0.6 Ma, the area was subjected to an important extensional tectonic phase which caused the uplifting of the NW oriented Monte Mario ridge. The Mount Mario ridge together with the pre-existing Pomezia rise caused a continuous topographic barrier that forced the Paleotiber River to move its course eastward, and its delta in that period moved near the present Anzio village. c) At the same time, the area was interested by volcanic events. Two important volcanic districts, the Sabatini volcanic District, almost 20 km NE of the present Roma, and the Colli Albani volcanic District less than 20 km SE, started their activity mainly characterized by violent explosions of ignimbrites and fall pyroclastics covering the area with a thickness of several hundred of meters (modified after GIORDANO *et alii*, 2002).
– *Evoluzione geologica dell'area romana. a) Un milione di anni fa (Pleistocene inferiore-medio) l'area romana è stata soggetta ad un sollevamento regionale, emergendo dal mare. Sulla terra emersa i processi erosivi si instaurarono immediatamente determinando l'organizzazione del reticolo di drenaggio. L'antico Tevere (Paleotevere) sviluppò la sua valle in prossimità della catena appenninica e il suo delta nell'area di Ponte Galeria. b) Tra 0.7 e 0.6 milioni di anni, l'area è stata soggetta ad una importante fase tettonica di tipo estensionale che ha causato il sollevamento della dorsale nordoccidentale di Monte Mario. La dorsale di Monte Mario insieme con il preesistente sollevamento di Pomezia hanno causato una barriera topografica continua che ha determinato lo spostamento del corso del Paleotevere verso est e del suo delta vicino all'attuale abitato di Anzio. c) Nello stesso periodo l'area è stata interessata da eventi vulcanici. Due importanti distretti vulcanici, il distretto dei Sabatini, circa 20 km a nord-est dell'attuale Roma, e il distretto dei Colli Albani, a meno di 20 km a sud-est, incominciarono la loro attività, prevalentemente caratterizzata da violente esplosioni ignimbritiche e piroclastiche che hanno ricoperto l'area con uno spessore di varie centinaia di metri (modificato da* GIORDANO et alii, 2002).

stagnating in the low topographic area limited by the Monte Mario-Pomezia ridge and the Apennine chain, coming in contact with the rising magma, determined violent phreatoplinian explosions (fig. 3; DE RITA *et alii,* 2002). The ignimbrites (four successive units separated by paleosoils: Trigoria, Tor de Cenci, Palatino and Cavaliere units) expanded several kilometres from the crater reaching the sea westward and climbing the Apennine eastward.

After these volcanic events the morphology of the roman area was completely flattened, assuming the aspect of a large and flat plateau dissected by the course of the Tiber river which had moved again westward, close to its actual position. A similar history was repeated every time that new violent ignimbrite explosions occurred during the Tuscolano-Artemisio Epoch (from 600 ka to 300 ka; DE RITA *et alii,* 1995; 2005) (fig. 4) and filled the valleys newly created by the erosive processes occurring after each eruptive phase. The thickness lateral variation of the ignimbrite deposits indicate the shifting of the paleo-valleys of the roman land after each eruption. The erosive processes were particularly active for two reasons: (i) for the quaternary wide sea level oscillations which characterized the climate during this period and (ii) for the enormous amount of new material added to the topography by the volcanism. Obviously, if the sea level was lowering during or after the eruptions, the cut of the valleys was particularly efficient. This is the reason of the seven hills of Roma due to the development of deep valleys on the ignimbrite plateau close to the delta of the Tiber river during the last glacial period, when the sea level was more than 100 m lower than at the present (fig. 5a). During the last interglacial period, still in course, these valleys come to be progressively filled by thick piles of fluvial sediments (more than 60 meters, in some cases) (fig. 5b).

## 4.– THE GEOLOGY OF THE CAPITOL HILL

The Capitol Hill, even today, shows its original geological characteristics and can be used as a lecture key to understand the geological evolution of the Roman area. The NW-trending hill has a very flat summit and steep cliffs with elevations between 40 and 45 m asl. The geology of the area of the Capitol Hill is summarized in figure 6a, whereas figure 6b shows a NNE-trending schematic cross section trough the Capitol Hill.

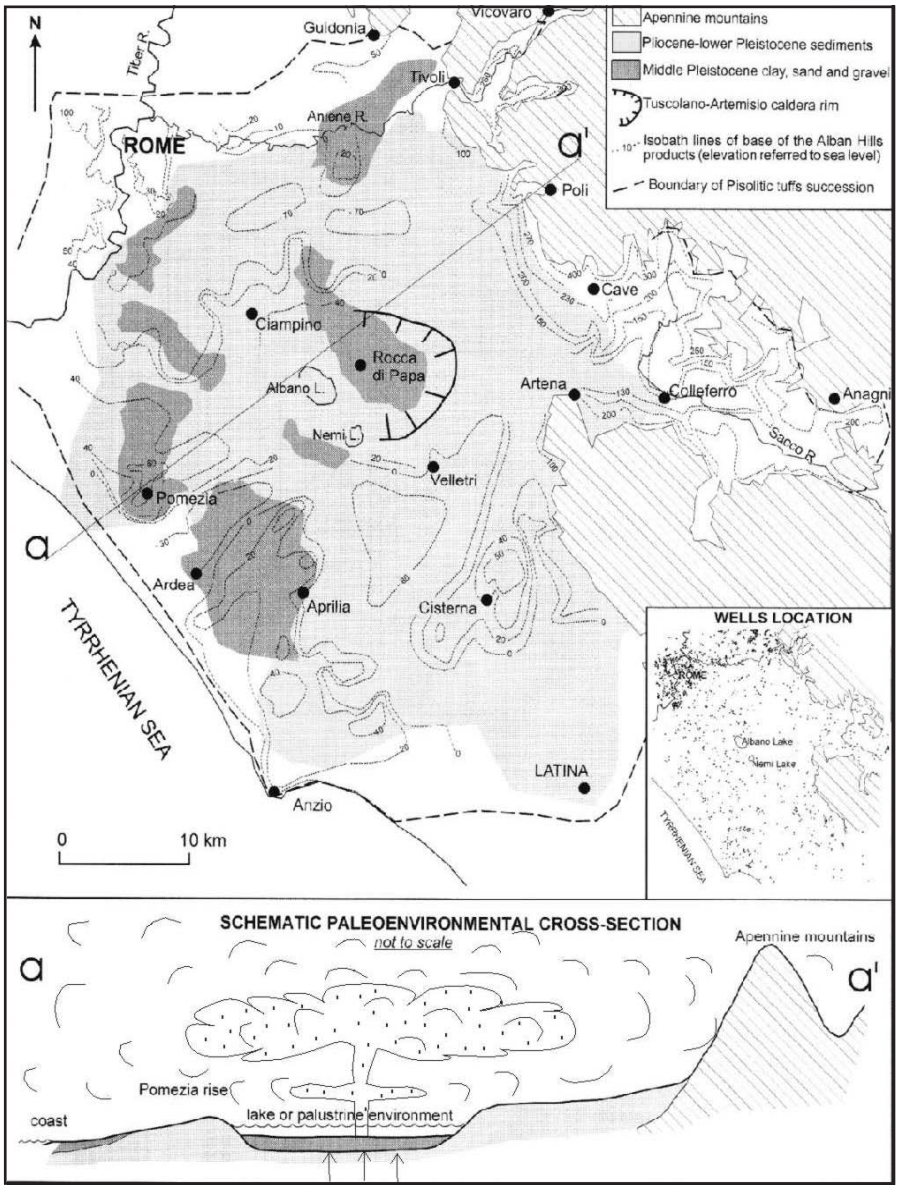


Fig. 3 – Schematic map showing the paleomorphology of the Alban Hills area at the beginning of the volcanism. The map has been constructed interpreting the data of several shallow wells, usually done for water supply (small square, down right of the map). Below is a schematic interpretation of the phreatomagmatic character of the first explosions from the Colli Albani volcanic District. The huge quantity of water stagnating in the low topographic area limited by the Pomezia rise and the Apennine chain, coming in contact with the rising magma, determined particularly violent explosions. The ignimbrites (almost four successive units separated by paleosoils: Trigoria, Tor de Cenci, Palatino and Cavaliere units) expanded several kilometres from the crater reaching the sea westward and climbing the Apennine eastward (modified after De Rita *et alii*, 2002)
– *Carta schematica che illustra la paleogeomorfologia dell'area dei Colli Albani all'inizio del vulcanesimo. La carta è stata costruita interpretando i dati di numerose sorgenti poco profonde, generalmente utilizzate per l'approvvigionamento d'acqua (piccoli punti in basso a destra della carta). In basso un'interpretazione schematica del carattere freatomagmatico delle prime esplosioni del distretto vulcanico dei Colli Albani. La grande quantità d'acqua accumulatasi nell'area compresa tra la dorsale di Pomezia e la catena appenninica, venendo in contatto con il magna in salita, determinò esplosioni particolarmente violente. Le ignimbriti (per lo più quattro unità successive separate da paleo suoli: unità di Trigoria, Tor de Cenci, Palatino and Cavaliere) si espansero per diversi kilometri dal cratere raggiungendo il mare ad ovest e salendo verso l'Appennino verso est (modificato da* De Rita et alii*, 2002)*

The most ancient deposits outcropping in the Campidoglio are made of an aggradational and fining upward succession of fluvial to lacustrine sediments. The succession, named S. Cecilia (cf. Marra & Rosa, 1995; Funiciello & Giordano, 2005; Giordano *et alii*, 2003) was deposited between 700 and 550 ka, by the activity of the Paleo-Tiber River that from lower Pleistocene to the beginning of Middle Pleistocene was flowing in a position more eastward, having its delta in the area of Ponte Galeria (Marra & Rosa, 1995; Milli, 1997). On this succession, volcanic deposits from the Colli Albani volcano lie. At the base of the Rupe there is the deposit of the third (named Palatino unit) of the four largest magnitudo eruptions occurred between 570 and 530 ka from the Alban Hill volcanic area (Karner & Renne, 1998; Karner *et alii*, 2001). This event is separated by a paleosoil from the subsequent Casale del Cavaliere unit (fig. 7). These eruptions were particularly violent (phreatoplinian type; De Rita *et alii,* 2002) because the rising magma encountered surficial waters related to a large costal lake or to a palustrine environment developed between 700 and 600 ka, when the uplift of the NW trending Mt. Mario ridge caused the diversion of the paleo-Tiber river toward southeast. The ignimbrite deposits are generally known in literature as "Pisolitic tuffs" (Fornaseri *et alii*, 1963) for the presence in the ashy matrix of accretionary-lapilli. In the Campidoglio area the ignimbrite deposits seem to be confined within a NW-trending paleo-valley that may be the course of the ancient Tiber or a secondary valley of it.

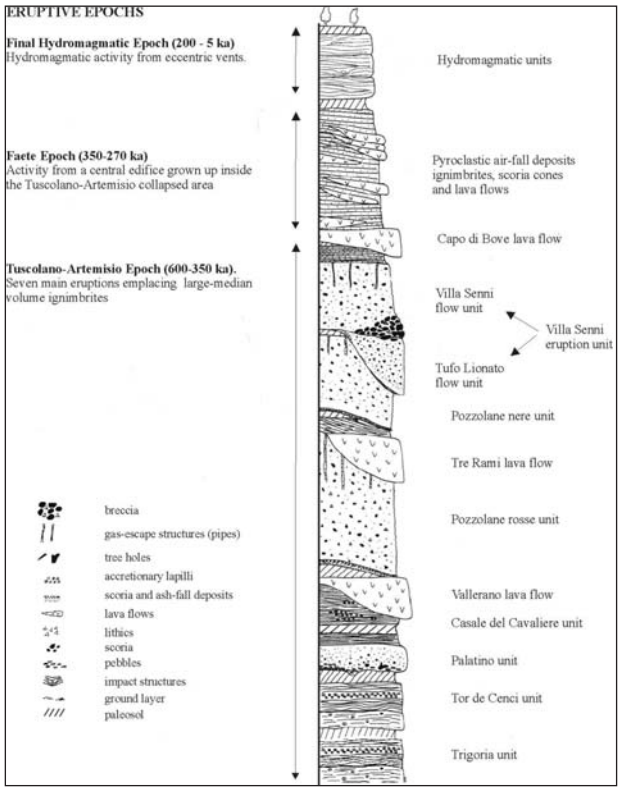


Fig. 4 – Up to date schematic stratigraphy of the Alban Hills volcanic activity (modified after ROSA, 1995).
– *Schema stratigrafico aggiornato dell'attività vulcanica dei Colli Albani (modificato da ROSA, 1995).*

Outcrops along Via della Consolazione allow to recognize a massive and poorly sorted deposit, made by 90% coarse ash-sized matrix composed of juvenile shards and fragments of analcime, clinopyroxene and mica crystals. Lava lithics and vescicular scoria lapilli are dispersed in the matrix. At the base of the unit it is possible to observe wood remains, density structures and calcareous and siliceous fluvial clasts ripped up by the pyroclastic flow (fig. 8).

Thin deposits of clastic and volcaniclastic fluvial materials lie on the Casale del Cavaliere unit and are visible along Via della Consolazione. They are the record of fluvial processes occurred immediately after the eruption to restore the normal sedimentary conditions. The two phreatoplinian deposits in the Campidoglio area are deeply eroded. On the erosive westward dipping surface is the deposit of the Villa Senni unit whose thickness increases westward (fig. 9). This suggests that significant modification of the drainage network occurred between the deposition of the phreatoplinian units and the subsequent Villa Senni volcanic unit occurred at about 350 ka. During this interval of time a new important valley, northwest of the ancient one, in the area where now is Via del Teatro Marcello, was eroded. This event probably occurred because of the subsequent deposition of ignimbrites (Pozzolane rosse and Pozzolane nere units dated at 430 ka; KARNER *et alii*, 2001) from the Alban Hills volcano whose emplacements forced the Tiber river course westward. None of these ignimbrites is present in the Campidoglio area.

The Villa Senni unit is composed of two different deposits: (i) the Tufo Lionato and (ii) the Villa Senni units which are the lower and upper flow units respectively of the same eruption. These eruption-units have been dated several times with different techniques at ca. 350 ka (BERNARDI *et alii*, 1982; RADICATI DI BROZOLO *et alii*, 1981; KARNER & RENNE, 1998; KARNER *et alii*, 2001). The Rupe Tarpea is made of the Tufo Lionato deposit (fig. 10) whereas the Villa Senni unit is not present. It has very limited and thin exposures in the Campidoglio area.

The Tufo Lionato eruption-unit is characterized by yellowy-reddish ashy matrix composed of juvenile shards and fragments of analcime, clinopyroxene and mica crystals. Yellow pumices, black scoria, lava and holocrystalline (leucite + pyroxene) lithics may be found dispersed in the matrix. The name Tufo Lionato comes from the yellow colour of the ashy matrix resembling that of the lion head of hair and from the lithification of the tuff due to intense processes of zeolitization of the ashy matrix that give to the tuff its particular resistance.

On top of the Tufo Lionato eruption-unit, the Aurelia unit is present (MARRA & ROSA, 1995, GIORDANO *et alii*, 2003; FUNICIELLO & GIORDANO, 2005). The Aurelia unit is made of pebbles, clays, sands and volcaniclastic sediments on a flat morphology representing the remain of a previous fluvial terrace (fig. 10). The altitude of the Aurelia deposits indicates the level of the river after the Villa Senni eruption. The last marine low standing at about 18 ka caused the intense fluvial erosion that has determined the steep cliffs of the hill. The present day morphology of the Capitol Hill is also partially due to the man action. The most important modifications of the morphology of the hill due to the action of the man are the separation of Capitol Hill from the Quirinal Hill wanted by Julius Caesar between the 108 and 113 B.C. to make space for the Roman Foro and the realization of the Campidoglio square that included the partial filling up of the threshold (*Asylum*) separating the two small tops of the hill, the Arx and the Capitolium. In urban areas the man actions may be considered as a geological factor strongly modifying the natural environment.

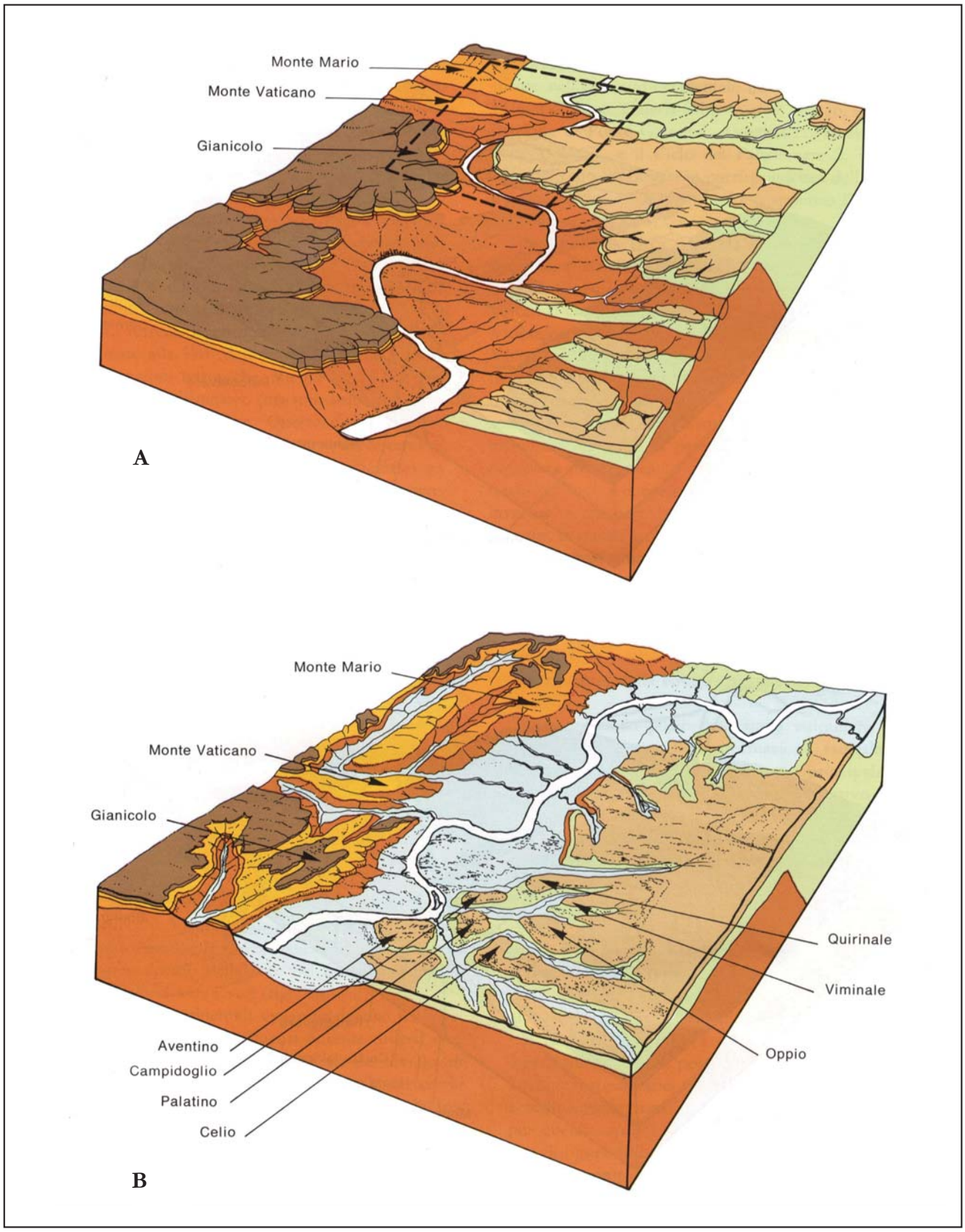


Fig. 5 – Block diagrams illustrating the recent geological evolution of the Roman area. 5A) Erosion processes related to the Wurm glacial period caused the excavation of deep valleys in the volcanic products. 5B) The erosion processes caused the formation of the seven hills upon which Rome grew up (from FUNICIELLO, 1995).

*– Il diagramma a blocchi illustra la recente evoluzione geologica dell'area romana. 5A) I processi erosivi correlati al periodo glaciale würmiano hanno causato l'escavazione di profonde valli nei prodotti vulcanici. 5B) I processi erosivi hanno causato la formazione dei sette colli sui quali Roma si è sviluppata (da FUNICIELLO, 1995).*

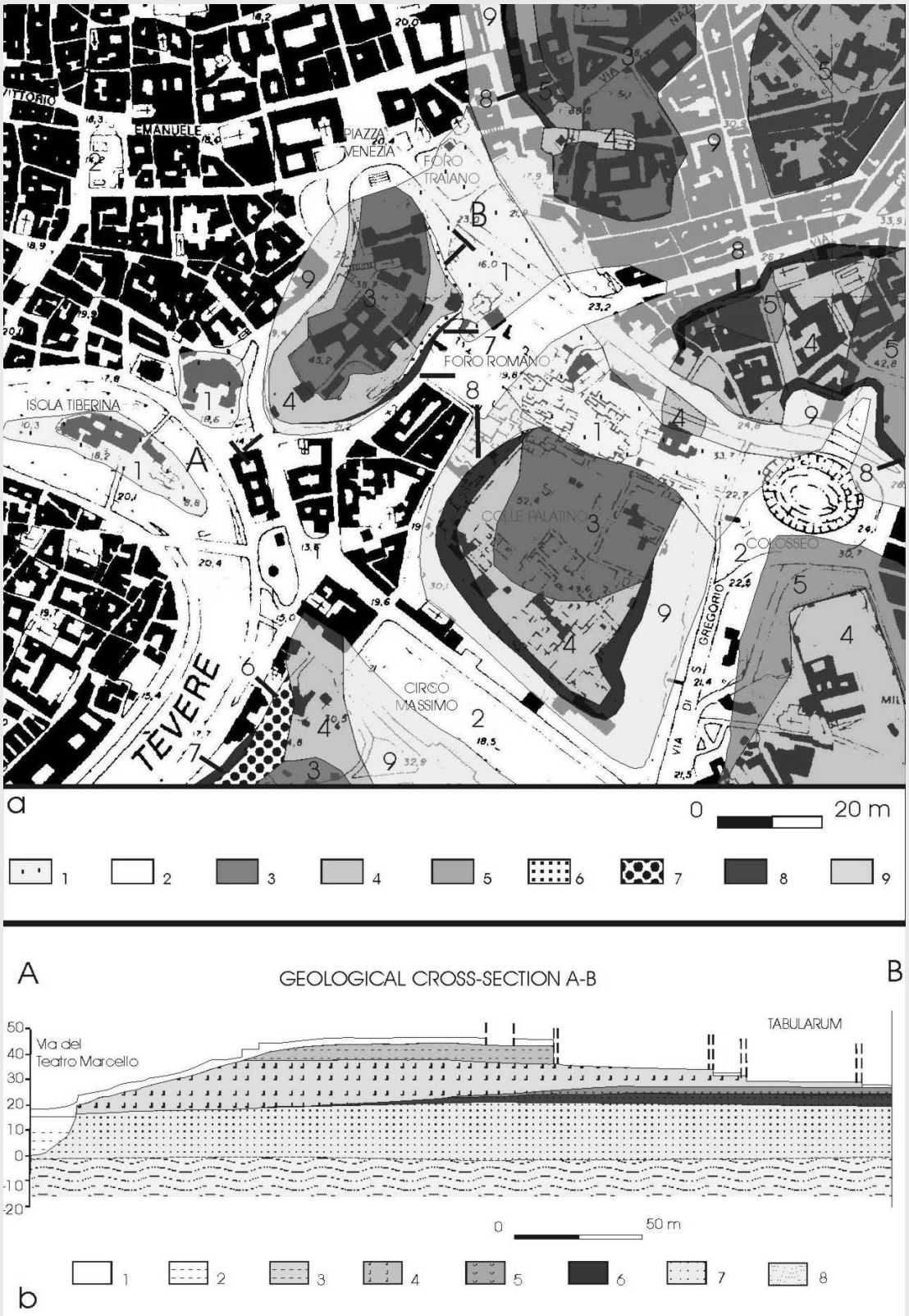


Fig. 6 – a) Schematic geological map of the Campidoglio area. Legend: 1. Urbanized areas. 2. Alluvial deposits. 3. Aurelia unit. 4. Villa Senni eruption deposits. 5. Sacrofano succession. 6. Valle Giulia unit. 7. Casale del Cavaliere unit. 8. Palatino unit. 9. Santa Cecilia unit. b) NE-trending cross section trough the Capitol Hill. 1. Antropic materials and buildings. 2. Alluvial deposits 3. Aurelia unit. 4. Tufo Lionato flow unit deposits. 5. Casale del Cavaliere unit. 6. Palatino unit. 7. Santa Cecilia unit. 8. Monte Vaticano Formation.

*– a) Carta geologica schematica dell'area del Campidoglio. Legenda: 1. Aree urbanizzate. 2. Depositi alluvionali. 3. Unità Aurelia. 4. Depositi dell'eruzione Villa Senni. 5. Successione di Sacrofano. 6. Unità di Valle Giulia. 7. Unità di Casale del Cavaliere. 8. Unità di Palatino. 9. Unità Santa Cecilia. b) Sezione del Campidoglio con direzione NE. Legenda: 1. Materiali antropici ed edifici. 2. Depositi alluvionali 3. Unità Aurelia. 4. Depositi dell'unità di Tufo Lionato. 5. Unità Casale del Cavaliere. 6. Unità Palatino. 7. Unità Santa Cecilia. 8. Formazione di Monte Vaticano.*

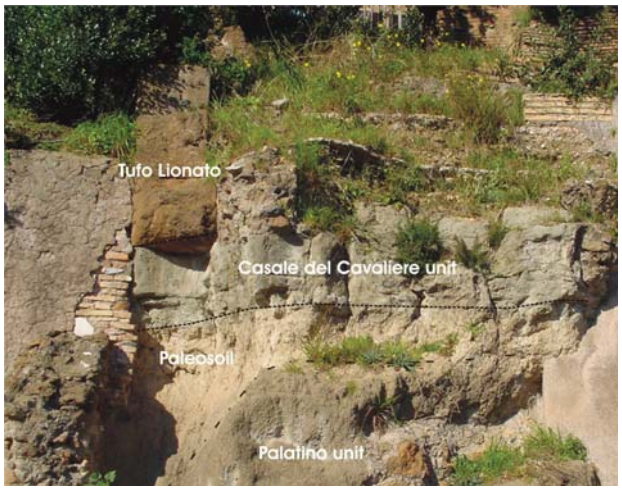


Fig. 7 – The Rupe Tarpea from Via della Consolazione. On top of the volcanic deposits (Palatino, Casale del Cavaliere and Tufo Lionato units) the sandy-clay sediments of the Aurelia formations are visible.
*– La Rupe Tarpea vista da Via della Consolazione. Al di sopra dei depositi vulcanici (unità del Palatino, unità Casale del Cavaliere e unità Tufo Lionato) sono visibili i depositi sabbioso-argillosi della Formazione Aurelia.*


Fig. 8 – Density structures at the base of the Palatino unit.
*– Strutture di densità alla base dell'unità Palatino.*

## 5. - CONCLUSIONS

In the Capitol Hill, the ruins of the roman monuments, the architecture of the historical buildings and the landscape constitute an inseparable whole: all these aspects are, in fact, closely interconnected. The landscape assumes an archaeological relevance as much as it perpetuates the morphological and landscape conditions which permitted the establishment and development of man's activity. The Rupe Tarpea reflects the concept that a landscape that has remained intact trough the millennia offers a key to the interpretation of ancient civilizations and acquires consequently an archaeological value (ANZIDEI, 1999).

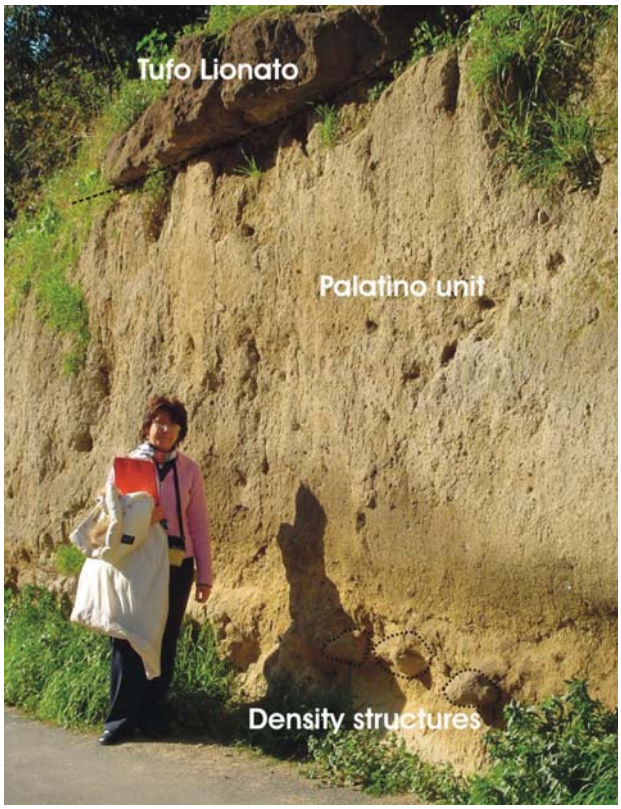


Fig. 9 – Outcrop on the south-eastern side of the Capitol Hill, showing the volcanic and volcaniclastic succession constituting the Rupe Tarpea. This outcrop represents the mark of the geological evolution of the area. At the base is the Palatino unit that a paleosoil separates by the overlying Casale del Cavaliere unit. This last unit appears deeply eroded by an erosion NW dipping surface forming a fluvial channel. The channel is filled up by the volcanic deposits of the Tufo Lionato eruption unit.
*– Affioramenti del settore sud-est del Campidoglio che mostrano la successione vulcanica e vulcano-clastica che costituisce la Rupe Tarpea. Questo affioramento rappresenta il segno dell'evoluzione geologica dell'area. Alla base affiora l'unità del Palatino che è separata dalla successiva unità di Casale del Cavaliere da un paleo suolo. Quest'ultima unità appare profondamente erosa da una superficie erosiva con immersione con direzione nord-ovest a formare un canale fluviale. Il canale è stato riempito da depositi vulcanici dell'unità eruttiva di Tufo Lionato.*

The geology and the geomorphology of the Capitol Hill and the steep cliffs of the Rupe Tarpea represent cultural heritages of the Roman area. In this small but representative area of Roma city the relationships among geology, geomorphology, archaeology, history and architecture are evident and significant and strongly suggest to include the Rupe Tarpea in the global sites to promote a discerning type of tourism that takes note of people's culture. The Romans, in fact, recognize the Rupe as part of their cultural heritage. The symbol of the cliff, the geological and morphological characteristics of the roman territory are harmoniously blended with the reasons of the legends and with the history of the Roman people.

The original geological characteristics of the site are well preserved and may be indicated to illustrate the regional geological characteristics of this area even constituting an irreplaceable witness of the history of the Roman area.


Fig. 10 – View of the Rupe Tarpea from southwest. The altitude of the Aurelia deposits indicates the level of the river after the Villa Senni eruption. – *Vista della Rupe Tarpea da sud-ovest. La quota dei depositi dell'Aurelia indica il livello del fiume dopo l'eruzione di Villa Senni.*

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