AQUINCUM

Ancient landscape – ancient town

Edited by:
Katalin H. Kérdő – Ferenc Schweitzer

Geographical Institute
Research Centre for Astronomy and Earth Sciences
Hungarian Academy of Sciences

AQUINCUM

ANCIENT LANDSCAPE – ANCIENT TOWN

THEORY – METHOD – PRACTICE

69

Geographical Institute
Research Centre for Astronomy and Earth Sciences
Hungarian Academy of Sciences

AQUINCUM

ANCIENT LANDSCAPE – ANCIENT TOWN

Edited by

Katalin H. Kérdő and Ferenc Schweitzer

Budapest, 2014

Chapters written by
TIBOR HABLE, ZOLTÁN HAVAS, KATALIN H. KÉRDŐ, ÁGOSTON JUHÁSZ, ORSOLYA MADARASSY, MARGIT NÉMETH, ANNAMÁRIA R. FACSÁDY, FERENC SCHWEITZER, KRISZTINA SZIRMAI, ORSOLYA LÁNG, PAULA ZSIDI

Original Hungarian text read by
LÁSZLÓ ALFÖLDI, DÉNES GABLER, ZOLTÁN KERESZTESI, TIBOR TINER

Translated by: ERZSÉBET E. BÁCSKAY

Translation revised by
LÁSZLÓ BASSA (Foreword, Introduction, Chapter 1–3), ALICE CHOYKE (from Chapter 4)

Maps and figures are compiled and drawn by
ISTVÁN ASZTALOS, JÁNOS BALOGH, KATALIN H. KÉRDŐ, KRISZTIÁN KOLOZSVÁRI, ANIKÓ KOVÁCS, MARGIT MOLNÁR, FERENC SCHWEITZER, JÓZSEF SZEBERÉNYI

Photos
LEVENTE BARTHA, JUDIT FÁRY-SZALATNYAY, ZOLTÁN HAVAS, PÉTER KOMJÁTHY, ORSOLYA LÁNG, GÁBOR RÁKÓCZI, ZSUZSANNA M. VIRÁG, ILONA MOLNÁR, ISTVÁN POÓR, ATTILA TÓTH J., ISTVÁN VICZIÁN

Computer cartography: ANIKÓ KOVÁCS
Cover design: KRISZTIÁN KOLOZSVÁRI, ANIKÓ KOVÁCS
Typography and layout: ESZTER GARAI-ÉDLER

Technical staff: MARGIT CSAPKA-LACZKÓ, ISTVÁN POÓR, MRS. L. TÁRKÁNYI

Responsible publisher:
Péter Ábrahám, Director-in-Chief, Research Centre for Astronomy and Earth Sciences HAS

Printing office: Pannónia-Print Kft.
Publication sponsored by

ISBN 978-963-9545-40-3
ISSN 0139-2875

CONTENTS

Recommendation *(Péter Farbaky)* 7

Foreword *(Katalin H. Kérdő–Ferenc Schweitzer)* 9

Introduction *(Ferenc Schweitzer)* 13

1. The geographical setting of Aquincum *(Ferenc Schweitzer)* 15

2. Geological conditions of the town and its immediate environs, landform evolution *(Ferenc Schweitzer)* 17
2.1. Landform evolution of the area 17
2.2. Surface rocks and sources of raw materials 19
2.3. The relief types in Aquincum and in its wider surroundings 21
2.3.1. Morphological types of mountain relief 30
2.3.2. Morphological types of plain relief 30

3. The reconstructed paleoenvironment of Aquincum *(Ferenc Schweitzer)* 34
3.1. Climatic conditions *(Orsolya Láng–Ferenc Schweitzer)* 34
3.2. Soils and vegetation as a function of topography 35
3.3. Environment types *(Ágoston Juhász–Ferenc Schweitzer)* 36
3.4. Water-courses and springs in Aquincum and in its environs 37
3.5. Some reflections on the Fürdő Island and on the Kis Island at Óbuda 42
3.6. Environmental conditions and environmental management in the Roman Period 46

4. Aquincum and its surroundings in the Roman Period
4.1. Natural characteristics, geographic toponyms *(Paula Zsidi)* 50
4.2. The place and role of the town in the history of Pannonia province *(Margit Németh)* 52
4.2.1. The Roman occupation and the Julius-Claudian dynasty 52
4.2.2. The Flavians and Traianus 52
4.2.3. The division of Pannonia into two parts. Aquincum as the capital of the province with a single legion 53
4.2.4. The capital of the province with two legions, the readjustment of boundaries in 214 56
4.2.5. The capital of Valeria – centre of military public administration 57
4.3. The Civil Town and its environs *(Paula Zsidi)* 58
4.3.1. The territory of the Civil Town and the history of constructions there. An outline 58
4.3.2. Land use in the environs of the Civil Town 63
4.3.3. The area between the Civil and Military Towns of Aquincum 68
4.3.4. The villa estates 70
4.4. Military forts in Óbuda *(Margit Németh)* 77
4.4.1. The ala fort at Óbuda 77
4.4.2. The 1st century AD legionary fortress 79
4.4.3. The 2nd–3rd century AD legionary fortress 80
4.4.4. The 4th century AD legionary fortress 80
4.5. The Military Town *(Orsolya Madarassy–Krisztina Szirmai)* 84
4.5.1. Geographic conditions and the 1st century AD settlement structure 84
4.5.2. The 2nd century AD settlement structure 87

4.5.3. The 3rd century AD settlement structure 89
4.5.4. Changes after the Roman Period 93
4.6. The territories South of the Military Town (Budaújlak–Felhéviz) *(Tibor Hable)* 93
4.6.1. The Eastern slopes on the Western side of Bécsi Road 95
4.6.2. Flood plain lowlands in the strip between Bécsi Road and Lajos Streeet 96
4.6.3. Strip along the river bank and the zone of the limes road on the Eastern side of Lajos Street 98
4.7. Enviromental aspects and the road network *(Paula Zsidi)* 99
4.8. The chain of defence features along the Danube and the fortifications on the Pest side *(Margit Németh–Krisztina Szirmai)* 100

5. Ancient surface types observed during archaeological excavations 106
5.1. Traces of Roman Period embankment and the former Danube bank in the territory of the Gas Factory *(Paula Zsidi)* 106
5.2. Remains left by ancient spring activity in the territory of the Szőlőkert Street villa estate *(Paula Zsidi)* 108
5.3. Traces of the Rádl Ditch and the Aranyhegyi Stream in the Military Town *(Paula Zsidi)* . 109
5.4. The Óbudai Island in the Roman Period *(Katalin H. Kérdő)* 111
5.4.1. A survey of earlier research es related to the history of the island 111
5.4.2. The building complex of the Governor's palace in Aquincum 114
5.4.3. The extension of the Governor's palace based on the results of the latest research 119
5.5. Paleochannels of ancient water-courses in Budaújlak 123
5.5.1. Gully, artificial channel or former Danube branch at Budaújlak (Tibor Hable) 123
5.5.2. The appearance of the so-called Szépvölgyi Ditch in an archaeological excavation (Annamária R. Facsády) 125

6. . Utilisation of natural resources in the environs of Aquincum in the Roman Period 126
6.1. Harnessing springs and the sacred precinct in the territory of Római Strandfürdő *(Orsolya Láng)* 126
6.2. Roman Period brick kilns in Budaújlak *(Annamária R. Facsády)* 127

7. Traces reflecting environment transformations from the Roman Period *(Paula Zsidi)* 131

8. The role of geographic conditions in the settlement history of Aquincum *(Katalin H. Kérdő)* 133

9. New evidence of the role of geographic elements in settlement history *(Zoltán Havas)* 136

Epilogue *(Katalin H. Kérdő)* 140

Bibliography 142
Abbreviations 159
Sources and additional data of figures and pictures 162
List of names and terms 168
Dynasties and emperors mentioned in this volume in the chronological order of their reign 177
A concordance table of data of levels *(Katalin H. Kérdő)* 179

Recommendation

The publication of an unusual volume – *AQUINCUM Ancient Landscape – Ancient Town* – is an event to be celebrated. It has come into being as the result of the close cooperation and interdependence of two scholarly disciplines with great traditions, geography and archaeology, and two of their outstanding centres in Hungary: the Geographical Institute, Research Centre for Astronomy and Earth Sciences of the Hungarian Academy of Sciences and the Aquincum Museum, a branch museum of the Budapest History Museum. This joint research took six years and represents a novel and unique phenomenon in Hungarian as well as in international scholarship. Thanks to the archaeological, topographical and physical geographical investigations carried out for several decades it has become possible to acquaint ourselves with the remains of cultures predating the Roman Period, the landscape shaping activity of the ancient Romans characterized by the precision of engineering as well as their magnificent architectural monuments. Through these data it has become possible to learn about the living conditions and unique aspects of the culture of those forty thousand Roman citizens who once inhabited this area.

The Danube River played a fundamental role in the formation and development of Aquincum, primarily as a waterway and only partly as a strategic-defensive line. The plain of the Danube, articulated by meanders, and islands as well as the spacious valleys extending into the eastern foreground of the Buda Hills offered a suitable place for settlement. The abundant karst springs provided clean drinking water while the warm springs on the Buda side, the rock formations where building and ornamental stone could be quarried, the clay needed for producing brick and tiles and the riverside suitable for harbours were all exploited as favourable geographical conditions.

The reader of this book finds answers to several exciting questions such as which site and location factors influenced the formation and development of the ancient town. The reader will also learn about the town's relationship with the surrounding environment.

Aquincum in the Roman Empire represents the ancient conditions in the oldest city center in Budapest, the capital of today's Hungary. The volume contributes to answering several questions about the town's changing topography as well. These questions are focused on the factors that determined the designation of the settlement parts and the road system, that is, why the topography of the town developed there and exactly why in that particular manner. In addition to the chapters that offer a historical and topographical overview, the presentation of the now disappeared ancient terrain constitutes an interesting part of the volume as well. We can discover where certain sections of the former Danube bank were located and how they looked, where the beds of the still existing streams formerly ran and what kind of traces were left behind by the sources of springs. Evidence of the landscaping activity of the ancient Romans can be encountered as well during the excavations at certain sites.

This scholarly work, an English version of the Hungarian volume published in 2010 under the title *AQUINCUM ókori táj – ókori város*, came into existence as the outcome of close cooperation between some prominent representatives of archaeology and geography and is based on the results of research carried out by generations of archaeologists and experts in geosciences for several decades. The richness of the illustrations constitutes an especially valuable element of the volume, which, in addition to the excavation photos and interpreted drawings, include several maps and graphic reconstructions. I respectfully recommend this unique scholarly work to both Hungarian and international specialists and to everyone interested in the subject.

Budapest, July 2014

PÉTER FARBAKY
Director-in-Chief
Budapest History Museum

Foreword

Geomorphological-paleoenvironmental studies to support archaeological excavations and investigations can be considered a new trend of research within the broad spectrum of studies dealing with environment and geomorphology. By publishing the latest results of investigations of this kind carried out on the territory of Aquincum and in its wider surroundings this book may rightfully reckon on the interest of both professional circles and the reading public.

Therefore we must welcome the publication of a volume of somewhat unusual character which was completed as a result of the collaboration of two important branches of studies, both having cherished traditions. The publication of this book was made possible by the close cooperation of two prominent institutes representing the above disciplines in Hungary: Geographical Institute of Research Centre of Astronomy and Earth Sciences, Hungarian Academy of Sciences (RCAES HAS) and Aquincum Museum of the Historical Museum of Budapest (BTM).

Geomorphology (a study of landforms and the processes that shape them) is an important branch within physical geography. With its potentials it has helped detect the characteristics of geographic conditions during the specific historical period when the antique culture flourished in Aquincum and in its neighbourhood. Remains from this age were investigated within their natural-ecological environmental context. Comparing the chronological frames of geomorphology and archaeology it is clear that geomorphology deals with evolution and transformation of the environment of the given area over a considerably longer period by presenting an overall survey of the geological history of the last approx. 10,000 years (Holocene), while archaeology deals with a shorter period of human history.

The archaeological, topographical investigations of several decades have accumulated a vast knowledge on the remains of cultures preceding the Roman Period, on the activities of the Romans aimed at the transformation of the landscape based on their technological achievements, and we could admire their highly advanced architectural monuments. These studies promoted to clear up the living conditions and cultural characteristics of peoples having lived in Aquincum.

As for the area studied several intriguing questions were formulated. E.g. what kinds of settlement environmental endowments had made possible the emergence of Aquincum? What kinds of settling factors motivated the growth and areal expansion of the ancient town and its relation to the environment? How could be characterised the physical geographical environment during the Roman Period? Whether the topographic conditions were suitable for human settlement? Whether the space available was sufficient for the establishment of the military settlement and Civil Town and did it provide for their expansion? Had the steadily changing landscape along the Danube any influence on construction works in Aquincum? Apart from factors important for the foundation of Aquincum what kinds of natural events (e.g. disastrous floods) had an effect on the life of the settlement and on the selection of the place to accommodate its most important buildings (e.g. the Governor's palace) or provoked their abandonment.

In the present volume attempts will be made to answer all of these questions. We are to present that in Aquincum and in its neighbourhood Roman remains came to light from terrace surfaces, flood-free islands above the swamps, ox-bow lakes or river branches. Waterlogged, swampy places were suitable for settlement only with severe restriction, however, they could have an important strategic role e.g. in defense.

During our studies we tried to clear up the role of those factors of nature which had affected the development of the settlement structure of the Roman Period. Romans had a special ability to realize advantages provided by geomorphological conditions and they skillfully used water, different surfaces of flood-plain relief and rocks for their purposes.

In our studies the main emphasis was put on the introduction into landform evolution and morphological types as well as on the presentation of the natural–ecological characteristics of the fluvial plain, a landscape in constant change. Already at the beginning of our studies it had to be realized that the geomorphology of the area

and the formation of the main types of relief had been determined first of all by processes which took place at the end of the Tertiary and during the Quaternary. Abundant information could be drawn on the rate of formation of characteristic geomorphological levels by observing the position of freshwater limestone horizons. The structure and geomorphological characteristics of the relief were represented in thematic maps.

The geomorphological map of Aquincum and its neighbourhood has a prominent professional prestige all the more because earlier only one similar map was published on this area as a supplement to the Ist volume of the History of Budapest (T. NAGY 1973)[1] which, however, represented the relief conditions and the drainage network rather schematically. (At the same time that map was different for it was conceived to show archaeological sites and demonstrate their main topographic relations for the whole territory of Budapest, from Prehistory until the Migration Period.)

Besides the presentation of soils, climate and quasi-natural vegetation a paleohydrographic reconstruction was also attempted. Our detailed analyses and geological profiles made in the area, furthermore the paleohydrographic map compiled using the borehole data provided information on the paleogeographic conditions of Aquincum in the 1st through 3rd centuries AD. A special difficulty of the task was that the paleoenvironmental conditions had to be established for a geologically very short period and with possible maximum accuracy.

The geomorphological chapters and the paleohydrographic maps are based on the studies which were made in the Geographical Institute of HAS. Furthermore the previous and latest results of the most important geological, geomorphological, hydrological and pedological surveys on the subject were used, published by László Alföldi, Nándor Bacsó, Mrs. T. Fodor, László Góczán, András Grynaeus, Henrik Horusitzky, Ágoston Juhász, Árpád Lorberer, Márton Pécsi, Gyula Scheuer, Ferenc Schweitzer, Pál Stefanovits, József Szabó, Jenő Szilárd, György Wein and Bálint Zólyomi.

The archaeological maps of the book represent certain segments of 2nd and 3rd centuries AD Aquincum with greater details. It was the flourishing period of the town. The time span was reduced because during the four centuries of the Roman rule the settlement pattern of Aquincum altered several times and important changes took place concerning the land use in the different parts of the settlement. Buildings were remodelled, outer and inner floor levels were raised considerably by levelling during reconstructions following the wars. Otherwise the representation of these different periods could be possible only by a series of separate maps. In addition at present the standard of investigations and interpretation of the results with regard to the different times of the Roman Period vary considerably.

Our intention was to deal with information regarding phases not represented in the maps as well as to tackle physical geographical processes and phenomena which were observed during archaeological investigations together with the related problems (e.g. whether the former Kis Island at Óbuda, which today is the southwestern tongue of the Óbudai Island, was actually an island in the Roman Period or not) and we changed our original concept accordingly and extended the text referring to these issues considerably.

In the reconstruction of the topographic conditions of the Roman Period we used the following method to involve archaeological data. As the investigations have been carried out in the area since the 19th century today we have nearly thousand localities to work with. From them those with accurate geodetic data were chosen. That is why the data of archaeological excavations made since 1969, having been surveyed according to a uniform geodetic concept including also the absolute data on levels are considered to be more important. Now it is already an essential condition of up-to-date studies. From the 90s of the last century on excavations were and are made mostly related to investments and they are financed by the business establishments interested. These excavations were made within the framework of a project started by the Aquincum Museum aimed at the study of the Roman Period settlement structure of Budapest. On the basis of data collected according to a uniform scientific concept there was an attempt to reconstruct the geography of the area as well.

The starting point of the representation of the settlement structure was the geodetic adjustment of smaller units. Certain areas (e.g.

[1] The map was compiled by Tibor Nagy and Ernő Nagy.

Budaújlak–Felhévíz, and portions of the military settlement and Civil Town that hitherto had not been investigated) where completely new archaeological results were obtained, as a first step were mapped at a scale of 1:200.

The next step was to select those objects on the sheets of the 1:1,000 scale geodetic summary maps which were then traced onto the geomorphological map. Its scale made possible the linear representation of only the largest, extensive features (roads, aqueducts, walls of the military camps, city walls). Other features (e.g. the most important excavated buildings of the military town, villas, springs etc.) we denoted with symbols. For the reconstruction of relief conditions first of all there were used the data of levels of Roman roads connecting parts of the settlement or avoiding them.

As the result of levellings the inner roads of the legionary camp and those of the Civil Town – within a given construction phase – can be regarded more or less horizontal. The inner floors of the buildings as a rule do not provide information on the original ground level. The most important altitude data were shown on the maps representing the Roman Period settlement pattern.

In the archaeological chapters a historical introduction is followed by the description of Roman Period settlement units proceeding from the north to the south. With the description of different neighbourhoods we wanted to emphasize the role of geographic factors and to underline changes in the land use over the centuries of the Roman rule. Due to their importance the results of studies made on the road network are summarized in a separate chapter. During archaeological excavations we had the opportunity to closely observe geological, geographical and other natural phenomena at several places. Because of the importance of these observations a short review is given on them, completed by detail-drawings and photos. A short summary of the most important Roman constructions and features related to the exploitation of natural resources as well as of marks of activities aimed at transformation of the environment can be found in separate chapters.

The scale of the key map did not allow the representation of all information judged essential (e.g. wells, altitude of levels), therefore we certain Roman Period settlement units were shown at a larger scale.

On the last figure of this book the most important archaeological localities of recent excavations are represented in a map against the background with the present network of streets. Places of earlier excavations in the legionary camp of Aquincum, in the Civil Town and in the military settlement are not represented on this figure. The volume summarizing the archaeological investigations made between 1969 and 2002 (FORSCHUNGEN 2003) includes their detailed description.

The adequate representation of geodetic level data and references to them caused several problems. One of the difficulties was that the two branches of studies tend to give altitude data above sea-level in a different way. In geographic studies absolute altitude is calculated from the level of the Baltic Sea (m aB) while in archaeology the level of the Adriatic Sea (m aA) is used. Therefore in the text and on the figures the calculation method was left intact that was used by the actual subject. The concordance table in the Appendix helps the reader to bridge over this contradiction. In the archaeological text it was inevitable to use Latin words, phrases and archaeological terms. Their explanation can be found in the List of names and terms. The collection of data was completed decisively before 2003, the results of excavations and investigations made after this term usually could not be represented in maps. They are mentioned, however, either in references in the text or in the notes. The most important ones of them are included also in the bibliography.

Regular geo-archaeopedological and malacological investigations at the excavations of the Aquincum Museum had been started since then (MINDSZENTY – HORVÁTH 2003, MINDSZENTY – HORVÁTH – KROLOPP 2006, SCHWEITZER – VICZIÁN 2009). The most important results of these investigations can be found in the reports on archaeological excavations which are published in the annals of the museum, entitled Aquincumi Füzetek.

It should be emphasized that this volume summarizes the work of not only those who are the authors of its chapters, but it is the result of the contribution made by generations of archaeologists over several decades. Their partial results, summarized works, meant a contribution of essential importance to the completion of this book. Here we mention only those scholars whose activity was the most important concern-

ing the Roman Period topography of Aquincum: Bálint Kuzsinszky, Lajos Nagy, András Graf, Melinda Kaba, Tibor Nagy, Klára Póczy, Aladár Radnóti, János Szilágyi, István Wellner. There were also used the results of investigations achieved by Júlia Altmann, Ágnes B. Tóth, Mrs. V. Bertalan, Patrice Bertin, Katalin Debitzky, Judit Gádor, Anita Kirchhof, László Kocsis, Gábor Lassányi, Erzsébet Márity, Dorottya B. Nyékhelyi, Györgyi Parragi, Andrea Pölös, Judit Topál and Péter Vámos.

Geodetic surveys were carried out by György Busi, István Forgách, Pál Héjjas, Ferenc Kalah, Antal Kiss, Tibor Kovács, Ferenc Noéh, Gyula Simonyi, Mrs. A. Szesztai, Mrs. A. Vándor. The archaeological drawings were made by Mrs. P. Czirják, Erzsébet Csernus, László Illés, Péter Szökrön, Mrs. P. Szökrön, computer graphics were prepared by Krisztián Kolozsvári and most of the photos were taken by Péter Komjáthy and Ilona Molnár. Alexandra Nagy participated in the compilation of the volume.

The work of the authors of the geomorphological chapters was added by János Balogh, who made an important contribution to this part of the volume with the compilation of several thematic maps. Thanks are due to Anikó Kovács, Margit Molnár and József Szeberényi for the careful computer compilation of maps and figures,

Katalin H. Kérdő
editor

Ferenc Schweitzer
editor

István Poór for the geomorphological photos, and Eszter Garai-Édler for the layout. The careful edition of the text is the thorough and conscientious work of Tibor Tiner and István Viczián.

Our studies, made between 1999 and 2009, were supported by the Hungarian National Scientific Fund (OTKA). Herewith the editors and authors would like to express gratitude for the sponsorship.

Budapest, March 2014

The editors

Introduction

The aim of geomorphological-paleoenvironmental studies completing the investigations of archaeological excavations was to analyze the paleogeographic and hydrographic conditions of the area in question, to describe the relief conditions of Aquincum and its wider surroundings as well as those characteristics of natural environment which had an influence on the formation and life of the town.

Both Aquincum and its environs fit into the right bank flood plain of the Danube. Therefore the emergence, development and extension, besides the relief conditions favourable for human settlement, were determined by the actual regime of the Danube, the frequency of floods, the areal extension of the largest floods, ground-water conditions depending on the regime of the Danube, excess waters, as well as by the construction and destruction work of wind. Ways and possibilities of the use of the environment were influenced also by the large number of karst springs of different temperatures upwelling first of all on the low and high flood plain levels.

The investigations only partly comprised the environs of Transaquincum and Contra Aquincum on the left bank of the Danube built on the alluvial plain, in an environment of smaller and larger islands, river channels, ox-bow lakes and backswamps alternating with each other.

The relief conditions of the environment of antique Aquincum, especially the paleogeographic conditions of the Danube flood plain in the 1st through 3rd centuries considerably differed from present-day ones. After the Roman Period, changes in the flow pattern of the river, development and abandonment of meanders, formation of bars, fluctuation of branches, formation of new branches or the partial filling up of the older ones have occurred rather frequently in the section of the river which divided the Pest alluvial plain into two parts.

To the formation of the elevated bank section of the Danube between Szentendre and the Gellért Hill has contributed the so-called Coriolis force which is the result of the rotation of the Earth. Eastward rotation causes objects on the surface of the Earth to be deflected rightwards in the Northern hemisphere. Consequently, it is the Western, right side bank of rivers flowing North to South which is undercut by water. As a result – and also affected by other factors of river valley development – the flood plain has become dissected by an entangled network of partly filled up backswamps, ox-bow lakes and former meanders. Then these surfaces constituted the so-called lower flood plain level, which later was gradually filled up with flood sediments, mostly with mud, fluvial sand and paludal clays. This level had deepened into the so-called higher flood plain level of the uniform alluvial plain only by 1–2.5 m (*Figure 1*).

The surface of the higher flood plain (terrace No. I) lay over the culmination level of the large floods and remained uninundated, except for the occurrence of some extreme events (e.g. intensive floods with ice drift). Thus their relief formed in Early Holocene, dissected into larger and smaller islands and developed about 10,000 years ago, provided a sufficient protection during high or even the highest water stages.

Both in the Roman Period and also later until flood control measures had been started, the regime of floods was determined by factors differing from the present ones. That mass of water, which earlier passed through the braided channel in Pesti Plain expanding over a considerably larger area, now flows embanked within the main bed and over the active flood plain. The active flood plain – the area between the levees – has been silted up therefore the draining capacity of the large floods decreased. Nowadays the water level during large floods considerably surpasses the altitude of flood plain relief at several places.

A similar situation occurred e.g. on August 19th, 2002 at the Római part (beach). The protection line built along Királyok Road, Nánási Road, is to defend the buildings of the quarters Aquincum, Rómaifürdő, Csillaghegy. The 848 cm high flood threatened to inundate the terrains at an altitude of 103.45 m aB. The river might have returned to its earlier abandoned beds and it could find its way toward the Margaret Island in the waterlogged depressions of the quarters Mocsárosdűlő–Filatorigát–Kaszásdűlő, in its partly or completely filled up beds. Due to the technical operations of flood control measures, and to the side-effects of river regulation (e.g. silting up) the flood levels of the Roman Period and those of our days differ considerably.

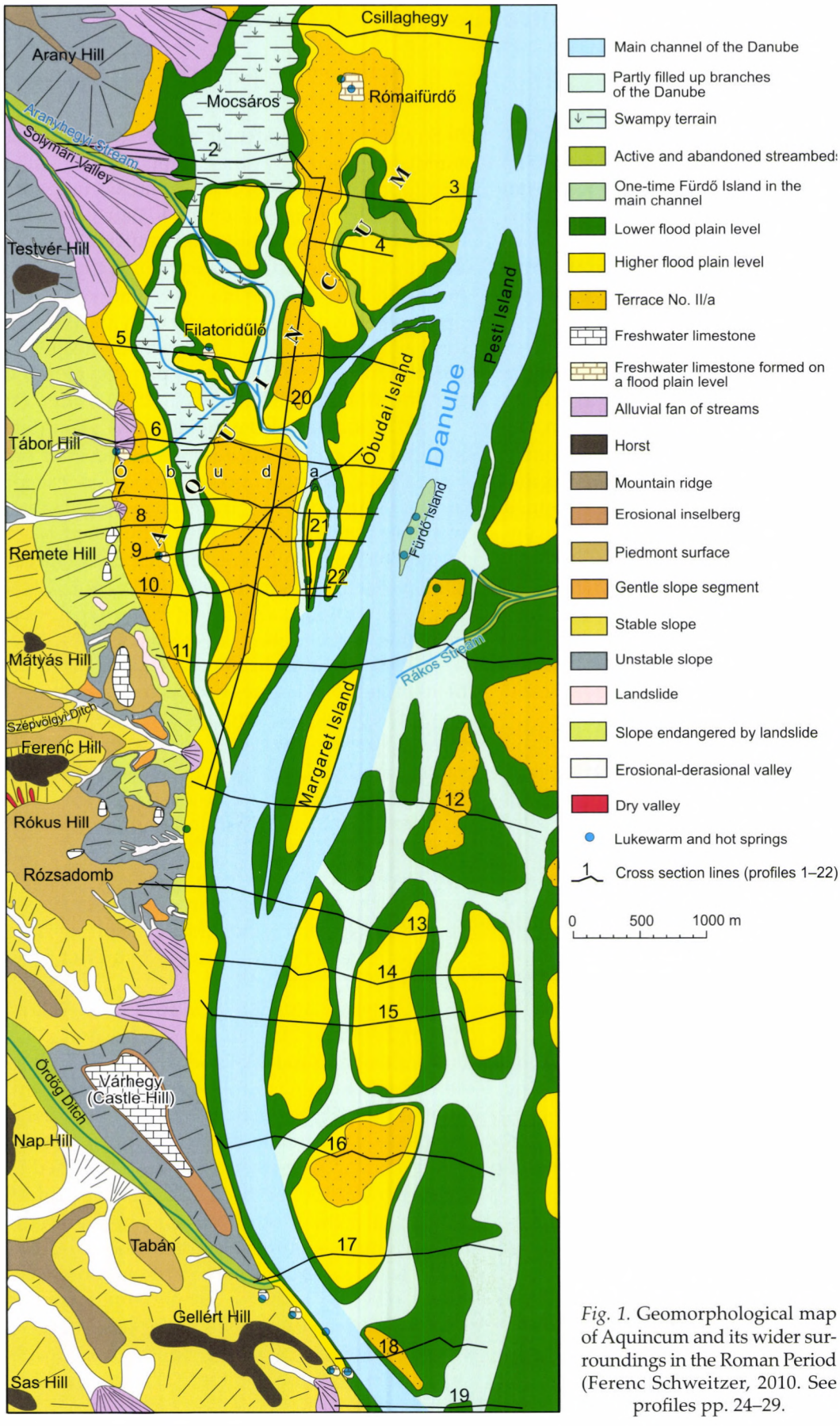


Fig. 1. Geomorphological map of Aquincum and its wider surroundings in the Roman Period (Ferenc Schweitzer, 2010. See profiles pp. 24–29.

1. The geographical setting of Aquincum

Aquincum and its wider environs are situated in the Eastern foreland of the Buda Hills on the terraced alluvial plain of the Danube. This plain is dissected by low terraces at an altitude of 99–110 m aB, and by flood plain levels. The North-Western quarters of Budapest were built over the remains of the nearly two thousand year old antique settlement (*Picture 1*).

Geographical environment of the right and left banks, topography of the area, hydrologic, hydrographic as well as climatic conditions had a fundamental influence upon the development of the Roman settlement and directions of its main traffic connections. It was Aquincum where the *legio II adiutrix* stationed and the town had a prominent role in the defense of the province and of the limes.

In the formation and development of Aquincum the Danube played a major part. It served first of all as a waterway, while at the same time it had a strategic role being the defense line.

The plain along the Danube dissected by terraces, river branches and islands and the wide erosion valleys projecting into the foreland of the Buda Hills altogether provided a place highly suitable for settlement.

Other factors as well, such as the karst springs abounding in water and providing drinking water, the thermal springs along the Buda thermal line, the sources of building and ornamental stones, the presence of clay necessary for brick and tile production and for pottery workshops, places suitable for river ports, offered favourable conditions for human settlement

The strategic security of Aquincum was further enhanced by the fact that the left bank branches of the Danube, to the South of the mouth of the recent Rákos Stream, enclosing a

Picture 1. The quarter of Budapest named Óbuda, built on the remains of Aquincum

stripe between the Heroes' Square and the Eastern Railway Station as far as the starting point of the Soroksári Road, formed a wide flood plain surface by building up terrace islands. On these islands Roman forts were built. In the 3rd and 4th centuries AD on one of these islands in the North existed Transaquincum opposite to Aquincum, and on an other islet in the South did the fort Contra Aquincum overlooking Gellért Hill.

The most suitable places for settlement could be found on the right bank of the Danube, on the narrower and wider terraced plain of the river, especially flood-free terraces and terraced islands rich in springs. No. II/a terrace islands, developed about 26,000–30,000 years ago, with traces of frost phenomena, covered by loessy sand and first of all also those horizontal calcareous layers which mark the boundary of permafrost (permanently frozen soil) as well as the gravelly and fluvial sand material of the high flood plain developed about 10,000 years ago, covered by loess-like flood plain material and sometimes mantled by sand-sheet were excellent aquifers. Along with the numerous karst springs the above formations provided drinking water for the gradually growing number of inhabitants. The braided channels of the Danube and the small streams arriving from the middle mountains formed the plain and regular annual inundations resulted in the emergence of various types of flood plain environment.

Talus slopes, marginal pediment surfaces and alluvial fans built up by streams and situated in the entrances of mid-mountain valleys were favourable places for human settlement. After forest clearings the surfaces covered by chernozem and brown forest soils became cultivated lands. There is a sequence of smaller or larger alluvial cones of streams in the area of the so-called Mocsáros (part of the District III of Budapest, now called Mocsárosdűlő). The material transported by streams to build alluvial fans was used by the Romans to fill up low-lying areas, e.g. in case of the Aranyhegyi Stream (ZSIDI 2007, 61–62).

The archaeological finds which came to light during excavations, the ruins of strategic-defensive buildings attest to the excellent building materials from the Buda Hills (sandstone, limestone, dolomite, freshwater limestone easy to carve and dress, clay, etc.) having been widely used for constructions.

Natural resources of the Buda Hills and of the terraced lowland environment of the Danube, the fertile soils brought into cultivation, building stones, high quality drinking waters, lukewarm waters suitable also for human consumption, thermal waters, extensive forests providing timber both as fuel and building material, and were factors promoting the settlement of Romans who had put this land occupied by them into an intensive use, thus turning it consciously into a domesticated landscape.

2. Geological conditions of the town and its immediate environs, landform evolution

2.1. Landform evolution of the area

The geomorphological conditions of Aquincum and its environs are determined basically by plain and mountain relief types. As for its morphology the Buda Hills represents the relief type of *low mid-mountains*. The uplifted plateau of the mountain, its horsts unaffected by denudation (Nagy- and Kis-Kevély, Csúcs Hill, Ezüst Hill, etc.) hardly elevate to summit levels over 550 m aB.

The mountain range with monadnocks and horsts is built up dominantly of carbonate rocks and it is dissected by tectonic grabens and intramontane basins. Parts of the range situated in the environs of Aquincum form a series of *horsts* usually at an altitude of 250–300 m aB. As the result of tectonic movements they are tilted and as an escarpment they reach the terraced valley of the Danube and the area of the Pilisvörösvári Valley by steep slopes of cliffs (WEIN 1977).

During the Tertiary the structures with horsts and grabens, elevated and low-lying terrains had been exposed to different effects of relief formation. The basins and low-lying horsts had become buried repeatedly and those eroded horsts which occurred in different orographic position in accordance with changed climatic conditions were lowered also by denudation processes under a semi-desert climate (PÉCSI – SCHEUER – SCHWEITZER 1982).

The so-called „Budai Marl" formation which had an important role in the topography of the area emerged in Late Eocene while Hárshegy Sandstone and Kiscelli Clay sediments accumulated during the Oligocene. Processes of tectonic morphological differentiation had created mid-mountain grabens and the tectonic ones running perpendicularly (Pilisvörösvári Ditch), intramontane basins (Pilisvörösvári Basin, Pesthidegkúti Basin, etc.) and series of horsts still dominant in the present geomorphology of the area. The step-like structure with horsts and faults along the Eastern marginal escarpment of the Buda Hills was formed at that time. It continued also in the mountain foreland, in the basement of the Pesti Plain (PÉCSI 1974, WEIN 1977, ALFÖLDI 1979).

Deep borehole data attest to Neogene and younger Pleistocene-Holocene, fluvial sequences having deposited in a thickness somewhere more than 100 m over the structure with horsts. In the Aquincum region this is the alluvial fan sequence of the Danube, partly covered by the alluvial cones of the affluent streams adjusted to the current base level of erosion.

The Miocene seas surrounding the mountains had covered the low-lying horsts with coarse limestone, and with sequences of clayey and silty sediments. This process culminated 12–17 million years ago in the Late Miocene when the present mountains, were partly covered by water (Szabadság Hill, Gellért Hill, Sas Hill), and partly rose as an archipelago above the Pannonian Sea which inundated the Carpathian Basin.

Parallel to the Upper Miocene (Pannonian) regression the clearing of the intramontane basins started together with the exhumation of low-lying horsts and with the subsidence of the foreland areas (Pesti Plain). On the margins of the mountains piedmont levels were formed sloping slightly toward the flood-plain of the Danube. They are related to a semi-desert environment which was characteristic of the inner part of the Carpathian Basin of the time. Then, during a long warm and humid period, an intensive formation of valleys started (Ördög Ditch, Solymári Valley[2], Szép Valley). This period also marked the beginning of the emergence of the drainage network in the Carpathian Basin. The regression of valleys, clearance of basins, alignment of the rising karst springs with base levels resulted in the deposition of a sequence of freshwater limestone horizons (SCHEUER – SCHWEITZER 1974, 1980) (*Figure 2*). The formation of freshwater limestone sheets is continuing into the present, their deposits in a flood plain position now develop in the spring horizons of Császár Bath and Római Bath (*Figure 3*).

The appearance and relief forming activity of the Paleo-Danube brought about a new phase in landform evolution. It formed its system of Pliocene, Pleistocene and Holocene ter-

[2] The other name for Solymári Valley is Pilisvörösvári Valley. The name of stream that flows through it is the Aranyhegyi Stream.

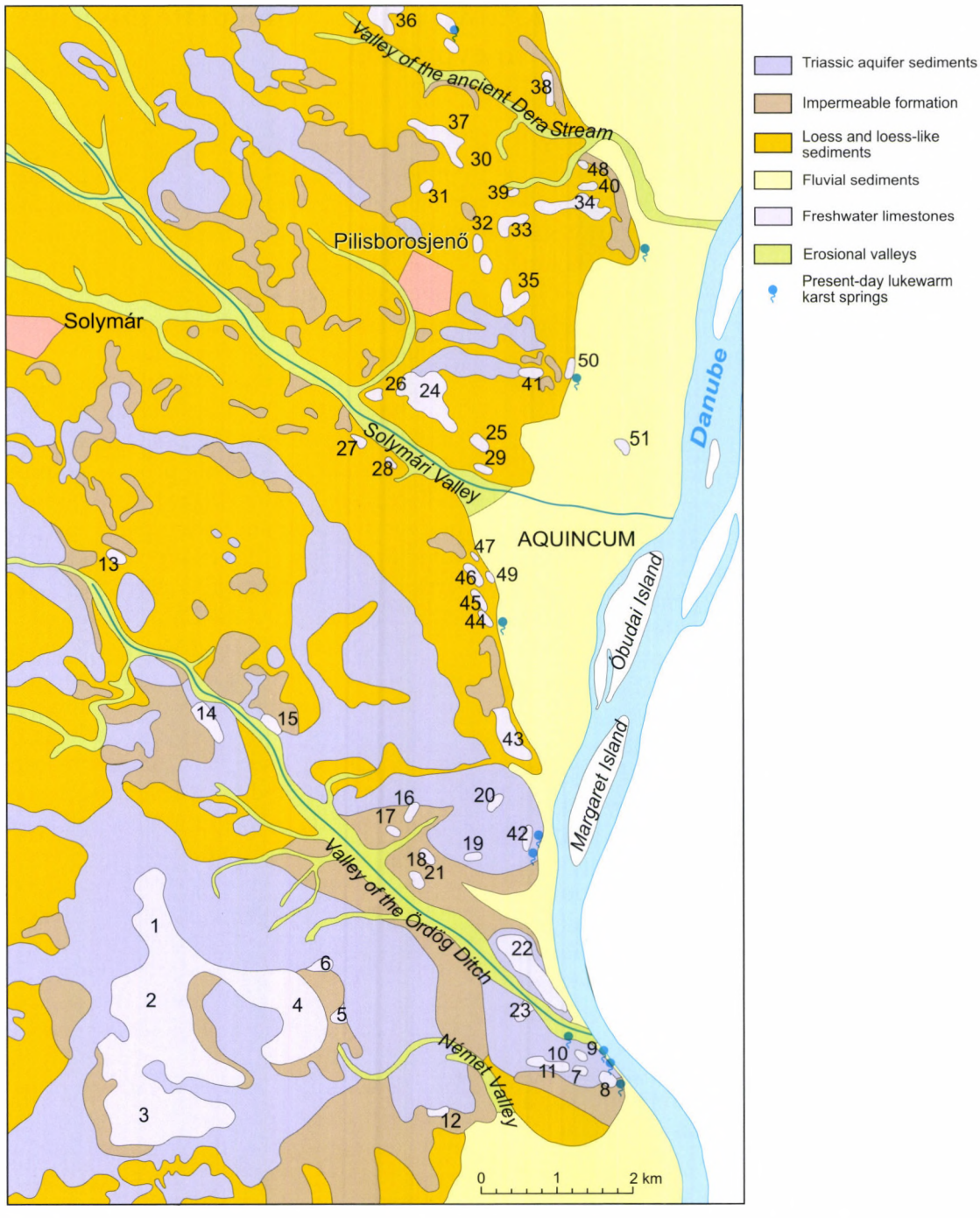


Fig. 2. The occurrence of freshwater limestone (travertine) formations in the Buda Hills and surroundings as the appearances of one-time karst springs (Gyula Scheuer–Ferenc Schweitzer, 1988). – 1–2 = Szabadság Hill (1 = Hármaskút Peak, 2 = Observatory); 3 = Budaörsi Hill, Kakukk Hill; 4–6 = Széchenyi Hill (5 = Felhő Street 7, 6 = Alkony Street); 7–11 = Gellért Hill (7 = Jubilee Park, 8 = Statue of Liberty, 9 = Számadó Street 7, 10 = Kelenhegyi Road, 11 = Somlói Road); 12 = Sas Hill; 13 = Máriaremete; 14 = Hűvösvölgy, Nyéki Road; 15 = Hűvösvölgy, Kondor Road; 16–19 = Rózsadomb (16 = Törökvész Road, 17 = Lepke Street, 18 = Vérhalom, 19 = Bimbó Road); 20 = Szemlő Hill; 21 = Research Institute of Viticulture; 22 = Várhegy (Castle Hill); 23 = Nap Hill; 24 = Üröm Hill, upper; 25 = Arany Hill, upper; 26 = Üröm Hill, lower; 27 = Arany Hill, lower; 28 = Csúcs Hill fields, upper; 29 = Csúcs Hill fields, lower; 30 = Harapovács, upper; 31 = Monalovác Hill, southern slope; 32 = Neighbourhood of Puszta Hill; 33 = Kálvária Peak, upper; 34 = Ezüst Hill, upper; 35 = Felső Hill; 36 = Majdán Plateau; 37 = Harapovács, lower; 38 = Verebes fields; 39 = Kálvária Peak, lower; 40 = Ezüst Hill, lower; 41 = Péter Hill; 42 = Rózsadomb, Apostol Street 15–17; 43 = Kiscelli Plateau; 44 = Farkastorki Road; 45 = Farkastorki Slope; 46 = Laborc Lane, upper; 47 = Laborc Lane, lower; 48 = Budakalász; 49 = Bécsi Road; 50 = Csillaghegy swimming pool; 51 = Római Strandfürdő

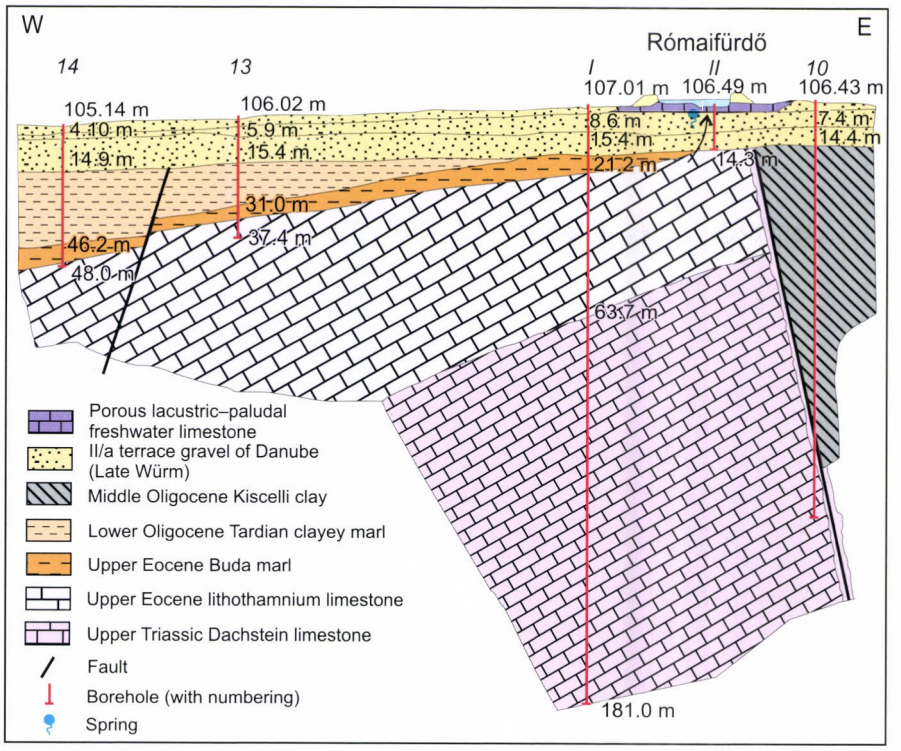


Fig. 3. The section of the freshwater limestone deposits at Rómaifürdő (Római Strandfürdő) (Gyula Scheuer – Ferenc Schweitzer, 1988)

races on the left bank (Pesti Plain) by cutting itself into the Upper Miocene delta formations and later into its own alluvial fan material. The Danube had occupied its present place in its recent valley during the last 10,000 years, in the Holocene, and flowing in a braided channel it formed the environment without restraint till the river regulations.

2.2. Surface rocks and sources of raw materials

The main rocks building up the mountain and plain types of relief can be found in a various areal distribution and formations. Different rocks of the region were extensively used for construction purposes in the Roman Period. At the same time the surface rocks or subsurface deposits determined also the geographical position and technical conditions of building constructions. The main types of rocks in the surroundings of Aquincum and their age are shown on *Figure 4*. The stability of slopes is represented on *Figure 1.*

The oldest rocks in the neighbourhood of Aquincum are the Upper Triassic carbonate sequences of the mountain frame which are continued also into the basement of the Pesti Plain by step-like escarpments.

Dachstein Limestone, Hauptdolomite and cherty „Raibli-layers" are the rocks which mainly build up the surface of Tábor Hill, Remete Hill, and Hármashatár Hill. Limestone forms steep cliffs in the range of the Hármashatár Hill while in the vicinity of Aquincum (e.g at Pünkösdfürdő) it could be found only in deeper boreholes at a depth of 500–550 m (*Figure 3*, borehole No. I.) At Rómaifürdő, where this formation yields the upwelling warm water, Dachstein Limestone lies at a depth of 64 m (WEIN 1977, SCHEUER – SCHWEITZER 1974).

Upper Triassic carbonate rocks are covered by Upper Eocene sediments of various thicknesses. *Redeposited bauxites, red clay layers, conglomerate and sandy limestone form* this sediment cover, eroded still in the second half of the Tertiary, the base of Eocene, furthermore nummulina-discocyclina limestone, *several kinds of marls* and the bryozoan marl known from the area, representing the characteristic rocks build up the relief of sequence of horsts consisting of Mátyás Hill, Szemlő Hill and Rózsadomb.

With their variegated sediment sequences Oligocene marl and clay formations (Kiscelli Clay Formation) cover the low-lying Mesozoic mountain ranges at the margins of the mountains like a mantle. They constitute the stepped piedmont parts of the mountain margin, and thickening eastwards form the basement differentiated by subsidences in the foreland of the mountains. Roman Period clay pits and brick kilns operated on the Kiscelli Clay in the zone of the mountain margins and piedmont surfaces (*Picture 2*).

Loess, loess-like formations and slope sediments, as the usually 5–8 m thick cover

Picture 2. Brick kiln burning the material of Kiscelli Clay Formation

sediments of eroded Tertiary and Quaternary surfaces were also sources of brick-making. Its facies redeposited by landslides and solifluction processes could reach a thickness of several meters in the hollows of piedmont surfaces formed in Late Tertiary and in the Quaternary ones on the higher terraces (*Picture 3*).

Due to their unstable character from the soil mechanical aspect loessy slope sediments and Oligocene clayey marl formations were a hindrance to siting of the buildings and their safety. First of all mass movements on slopes, slumps developed on the surfaces caused significant damage. Events of mass movements in the Roman Period, their pernicious effects are testified by archaeological observations. Cultural layers, kilns, ceramics disturbed by these movements, and dragged away suggest slope slides (*Picture 4*).

Freshwater limestone horizons (travertines) are the remains left by the activity of former springs and of those still active (*Figure 5*). Being easy to carve and resistant even under extreme environmental conditions freshwater limestone got precipitated from karst springs was a favoured building material of Romans. For construction puposes there were quarried travertines primarily in a mass unstratified, free from other unconsolidated sediments. In the Roman Period the most important quarries were situated in the Eastern part of the mountain margin. Traces of Roman Period quarrying were found on Ezüst Hill, Gellért Hill (*Figure 5*) and on the Kiscelli Plateau.

Fluvial gravel, sand, silt, etc. sediments adjusted to the current direction of flow of the Danube, related to its erosional and accumulational activity, were deposited mostly in longitudinal stripes of North to South direction, parallel to the direction of the flow. Paleochannels and hollows filled up with peat, alluvial silt, alluvial sand, and clay testify to the frequent changes in the paleohydrographic conditions during the Holocene (*Pictures 6* and *7*).

According to the data of boreholes clayey-sandy slope debris, gravelly sand with rock debris on the foothills, at some places the interfingered formations of sandy silt and clay are associated with the higher terraces (Nos II/b and III) of the Danube. These sediments of various thicknesses can be found along the Bécsi Road, at the margin of the Rózsadomb, and on the slopes of the Arany Hill.

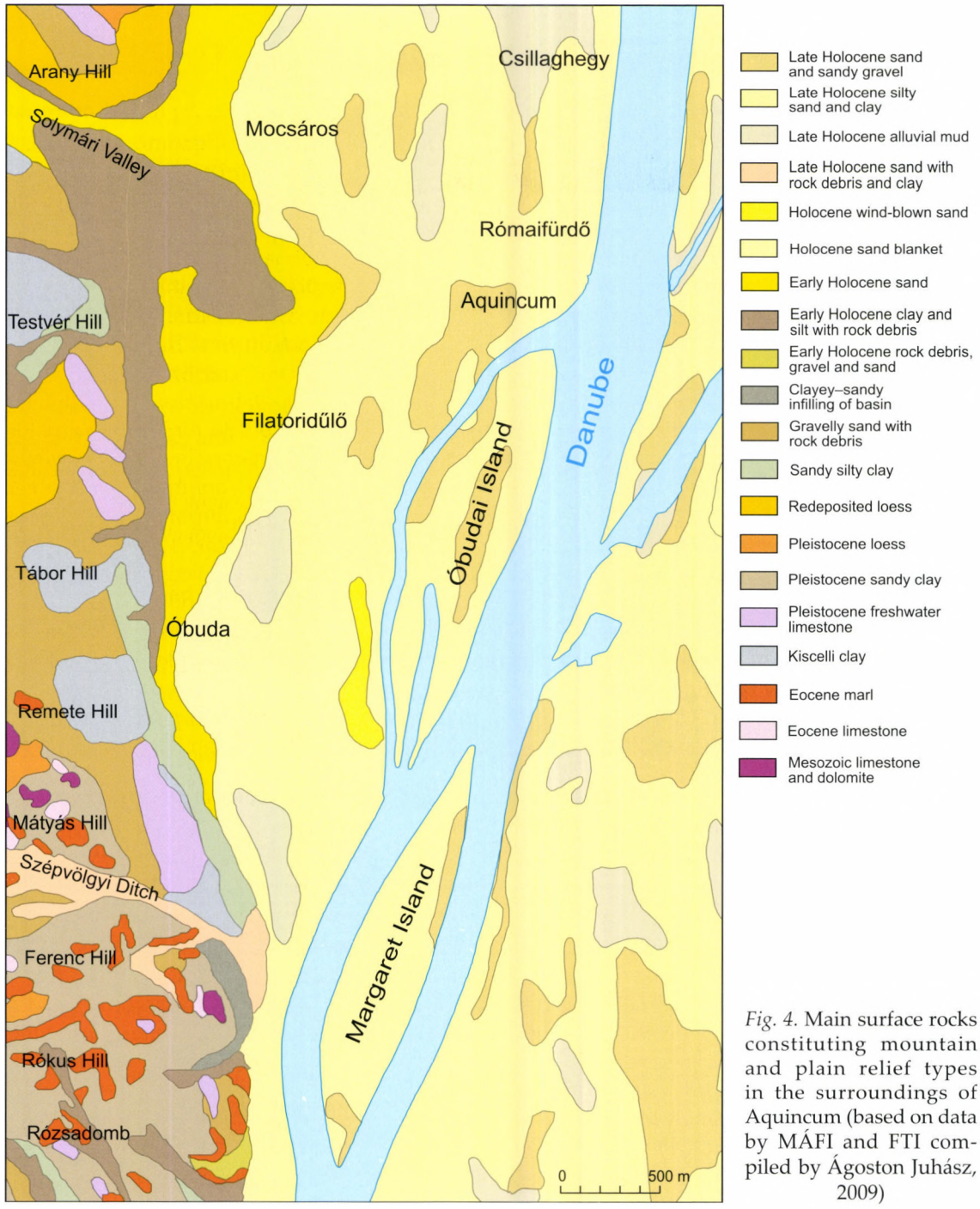


Fig. 4. Main surface rocks constituting mountain and plain relief types in the surroundings of Aquincum (based on data by MÁFI and FTI compiled by Ágoston Juhász, 2009)

The alluvial material transported by streams arrived from the nearby mountains and they differ from the sediments of the Danube. These unsorted, angular, alluvial debris, which mainly consist of dolomite as a matrix and frequently mixed with slope sediments was accumulated in the entrances of the valleys or in their foreground, in the form of detrital alluvial fans (Solymári Valley, Szép Valley, etc.) (*Picture 8*).

2.3. The relief types in Aquincum and in its wider surroundings

The Eastern marginal part and foreground area of the Buda Hills can be divided into two distinguishable units, notably into a unit of mountain relief type and another one of plain relief type, as it is represented in the geomorphological map of the area (*Figure 1*). To compile this map

Picture 3. Products of landslides and solifluction processes in the Quaternary hollows of piedmont surfaces and higher terraces

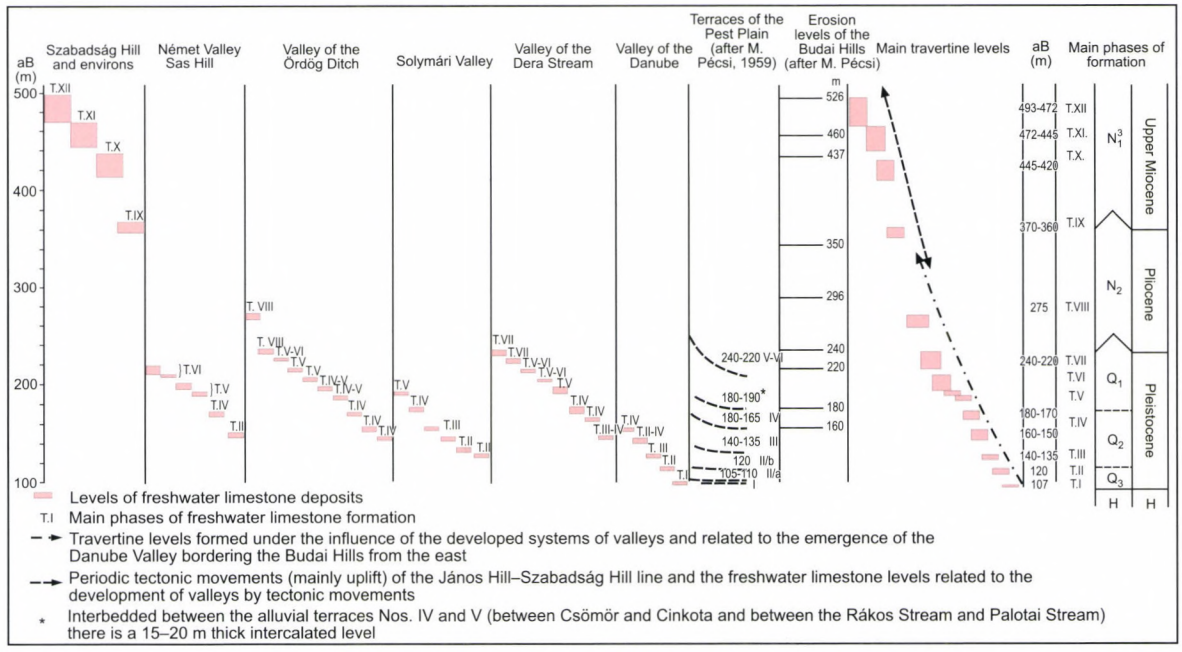
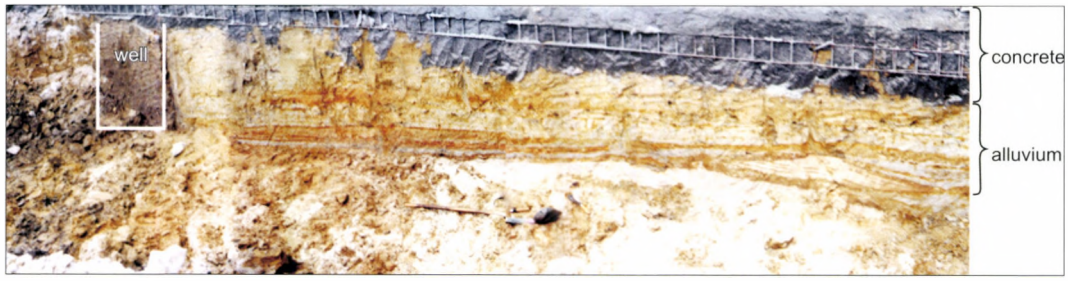


Fig. 5. Freshwater limestone (travertine) levels related to the valleys of the Buda Hills (Gyula Scheuer – Ferenc Schweitzer, 1988)

Picture 4. A closing wall deformed by mass movement processes in the Roman Period in the area of the so-called Testvérhegyi villa

Picture 5. Freshwater limestone quarry from the Roman Period on the Gellért Hill



Picture 6. Part of the lower flood plain level of the Danube filled up with layers of alluvial sand, mud and clay having caused the infilling and rise of the lower flood plain level and of the active flood plain. On the left side of the excavation there is the spot of a well from the early Roman Period.

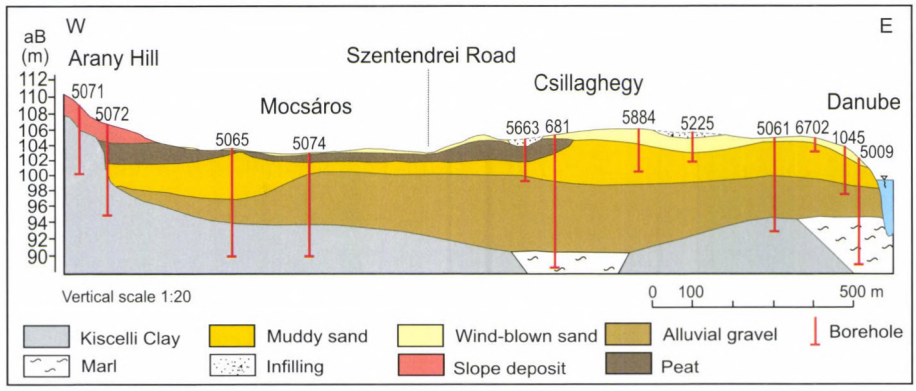
Picture 7. Bed filled up with sediments in the profile of an archaeological excavation at Budaújlak

Picture 8. Remains of an alluvial cone accumulated by the Szépvölgyi Stream at the exit of the valley

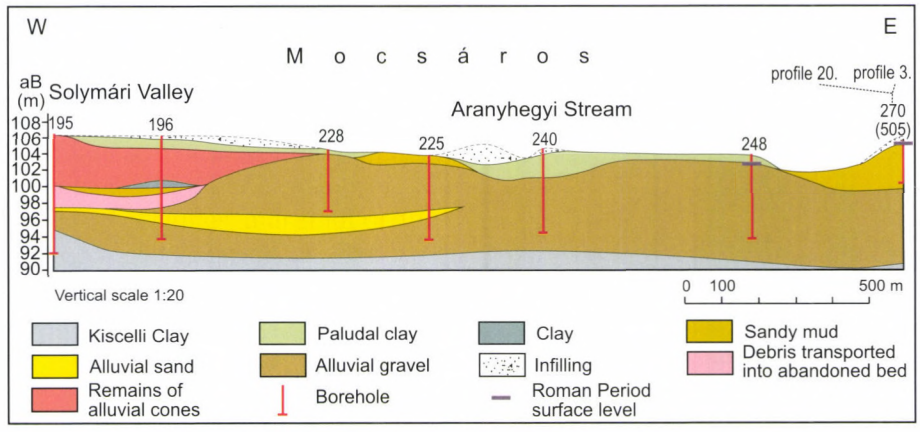
the paleogeographic map of the area was used made in the Geographical Research Institute HAS between 1970 and 1973 and also the works of HORUSITZKY (1933, 1939), PÉCSI (1958, 1959), PÉCSI – SZILÁRD – LOVÁSZ – JUHÁSZ – SCHWEITZER (1981) were involved.

The map includes also those geomorphological profiles which were constructed by using the data of boreholes deepened by the Central Geological Office (KFH), and by the Soil Surveying and Mapping Company (FTV) in the seventies of the last century (*Profiles 1 through 22*).

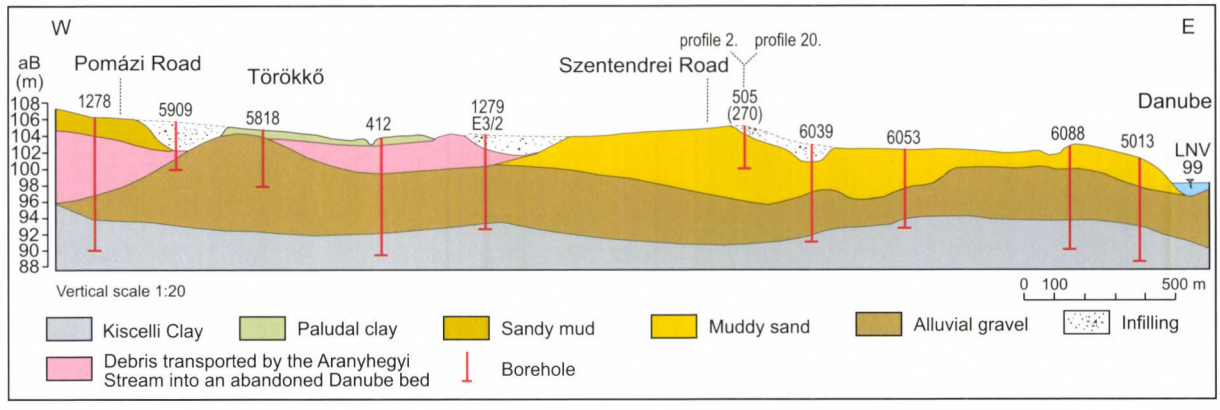
Geomorphological and hydrographic maps were originally designed at a 1:10,000 scale. For the sake of representation the scale of layers on the geomorphological-geological profiles had to be reduced. The direction of the profiles is mostly West to East, and in some cases North to South. These profiles present a more accurate picture of the ancient relief and of the hydrographic conditions of the area, and they provide information on the altitude of the Roman Period floor level above the level of the Baltic Sea.



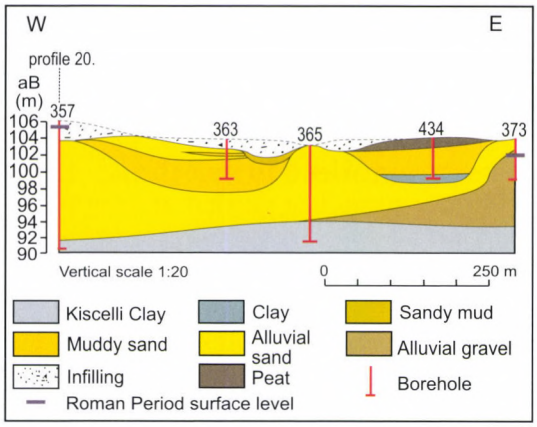
Profile 1. Geological-geomorphological profile of the area between Arany Hill and Csillaghegy. The former Danube bed is marked by peat layers. (On the basis of the borehole data of FTI compiled by F. Schweitzer, 2005.)



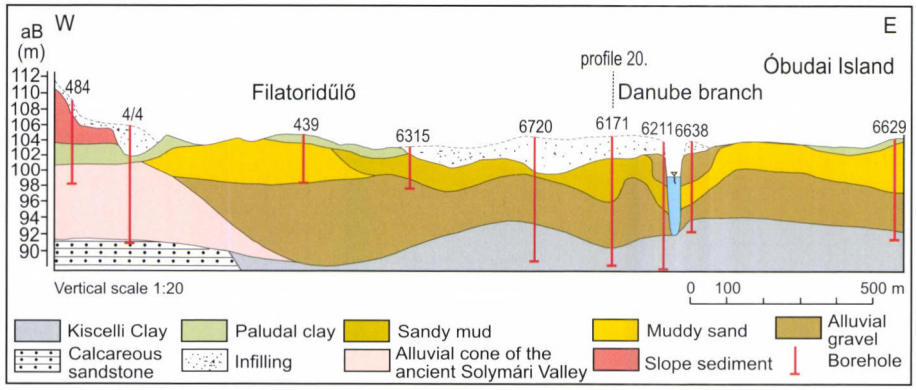
Profile 2. Geological-geomorphological profile of the area between Solymári Valley and Kaszásdűlő. (On the basis of the borehole data of FTI compiled by F. SCHWEITZER, 2009.)



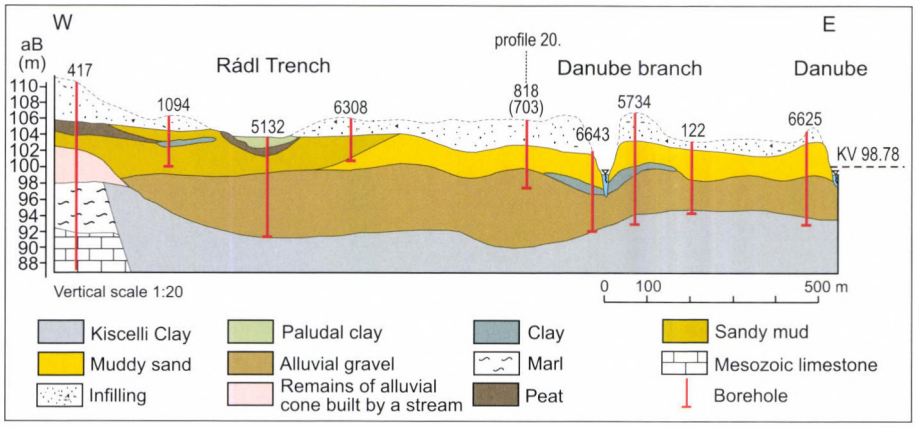
Profile 3. Geological-geomorphological profile between Pomázi Road and Rómaifürdő. (On the basis of the borehole data of FTI compiled by F. Schweitzer, 2005.)



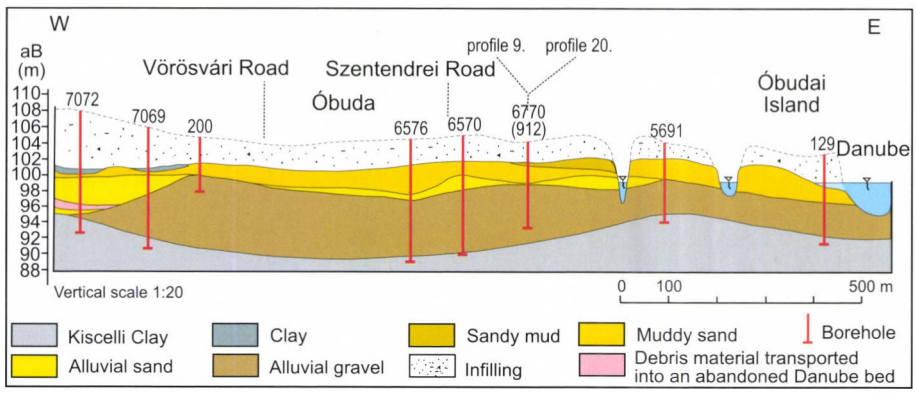
Profile 4. Geological-geomorphological profile between Kaszásdűlő and Aquincum. (On the basis of the borehole data of FTI compiled by F. SCHWEITZER, 2009)



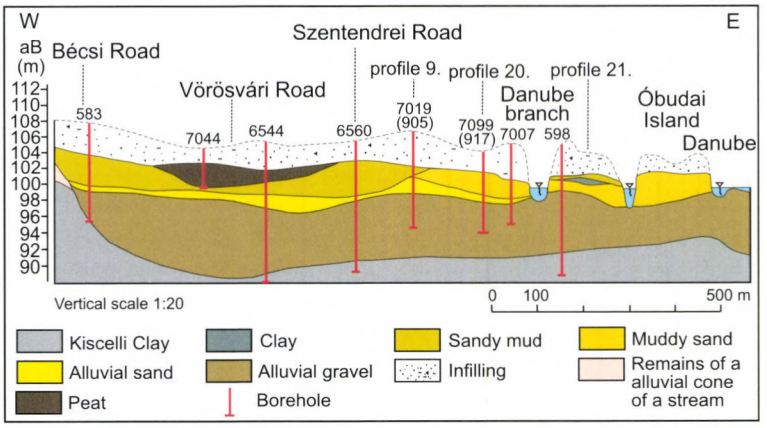
Profile 5. Geological-geomorphological profile between Filatoridűlő and Óbudai Island. (on the basis of the borehole data of FTI compiled by F. Schweitzer, 2005.)



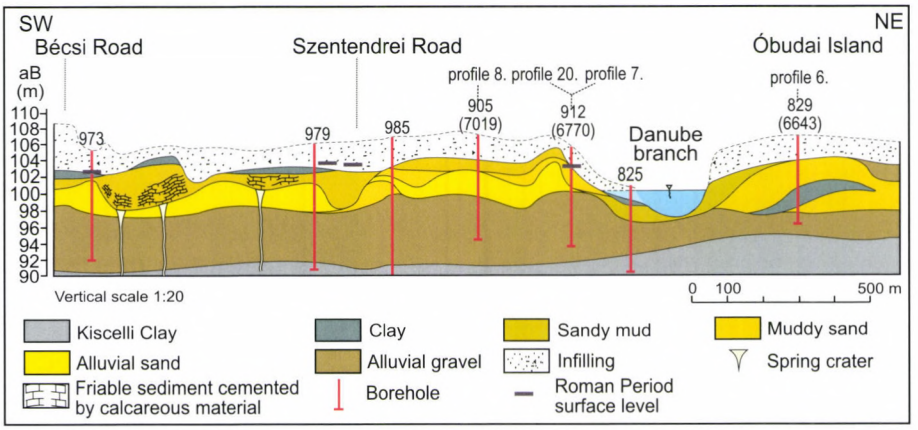
Profile 6. Geological-geomorphological profile between Tábor Hill and Óbudai Island. (On the basis of the borehole data of FTI compiled by F. Schweitzer, 2005.)



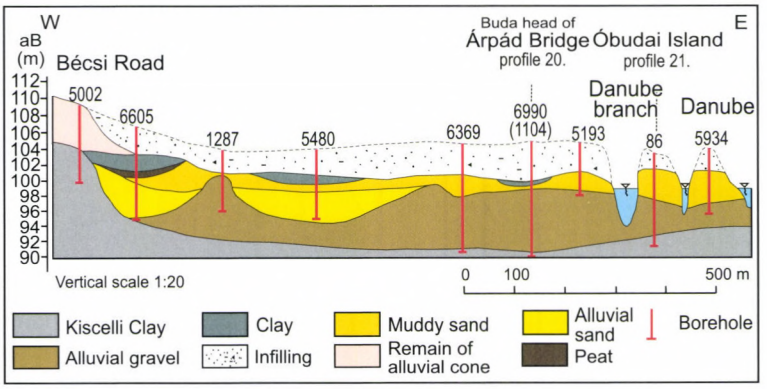
Profile 7. Geological-geomorphological profile between the Brick Factory at Óbuda and the Óbudai Island. (On the basis of the borehole data of FTI compiled by F. Schweitzer, 2005.)



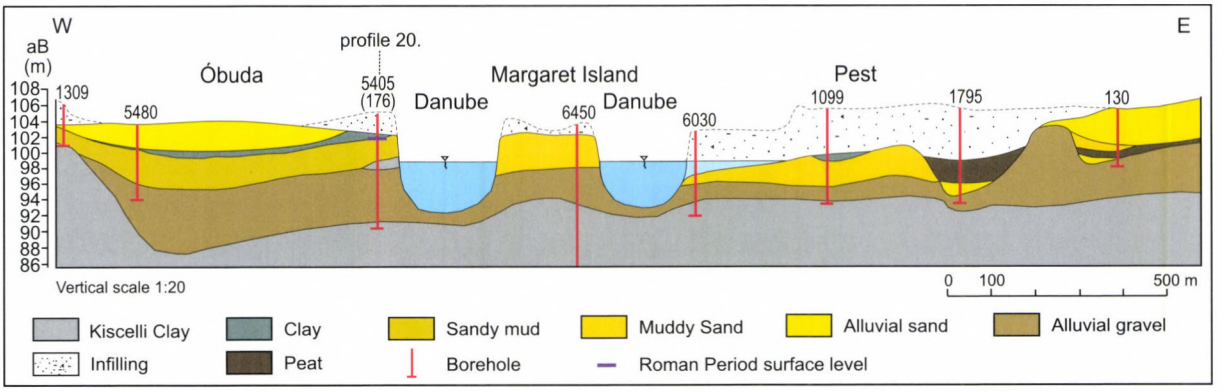
Profile 8. Geological-geomorphological profile between Bécsi Road and Óbudai Island. (On the basis of the borehole data compiled by F. Schweitzer, 2005.)



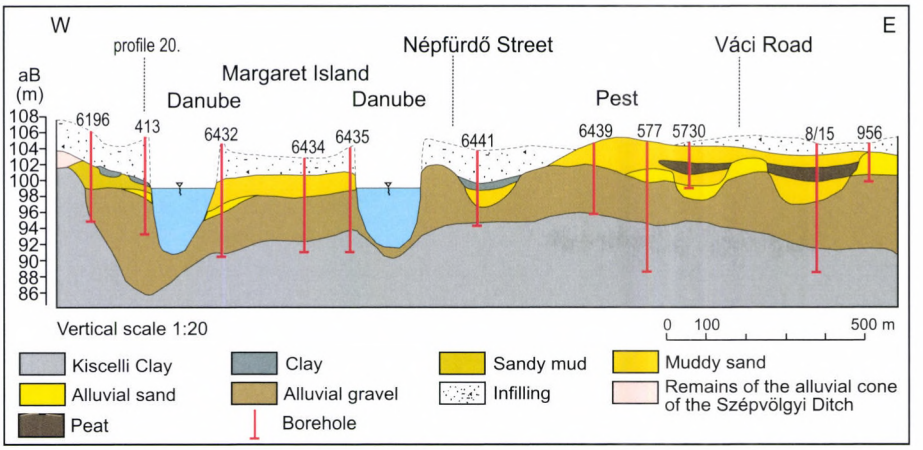
Profile 9. Geological-geomorphological profile between Bécsi Road and Filatorigát. (On the basis of the borehole data of FTI compiled by F. SCHWEITZER, 2009.)



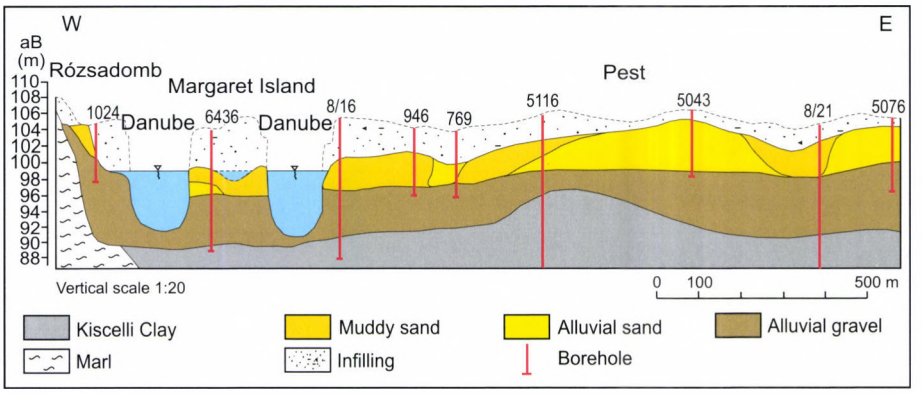
Profile 10. Geological-geomorphological profile between the Bécsi Road and Árpád Bridge. (On the basis of the borehole data of FTI compiled by F. Schweitzer, 2005.)



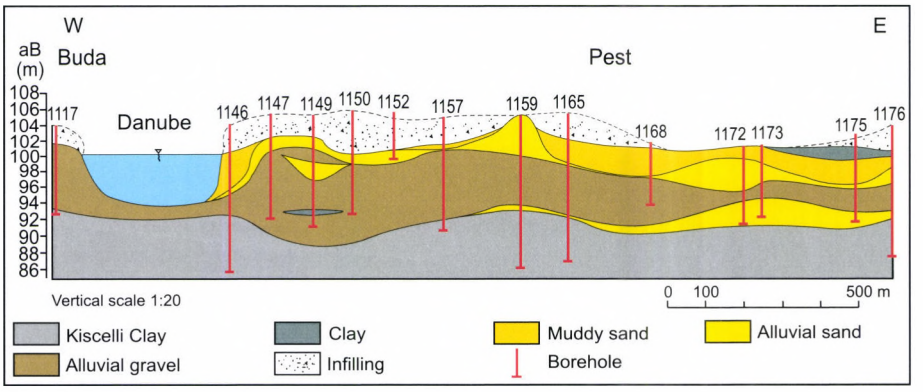
Profile 11. Geological-geomorphological profile between the amphitheatre of the Military Town and Rákos Stream. (On the basis of the borehole data of FTI compiled by F. Schweitzer, 2005.)



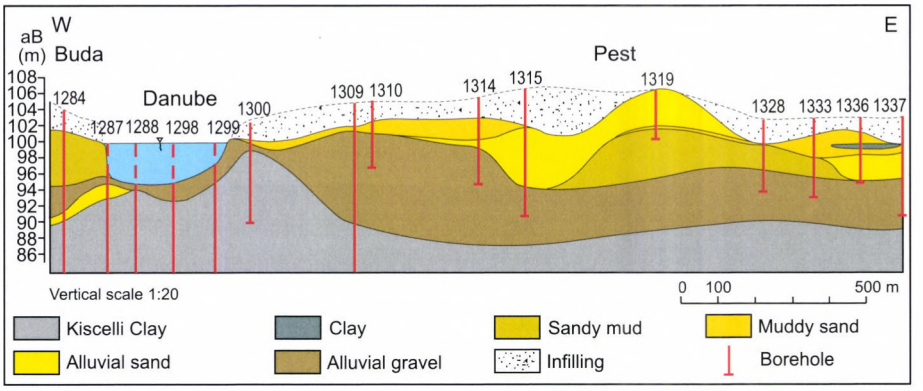
Profile 12. Geological-geomorphological profile between the Újlaki Church and Váci Road. (On the basis of the borehole data of FTI compiled by F. Schweitzer, 2005.)



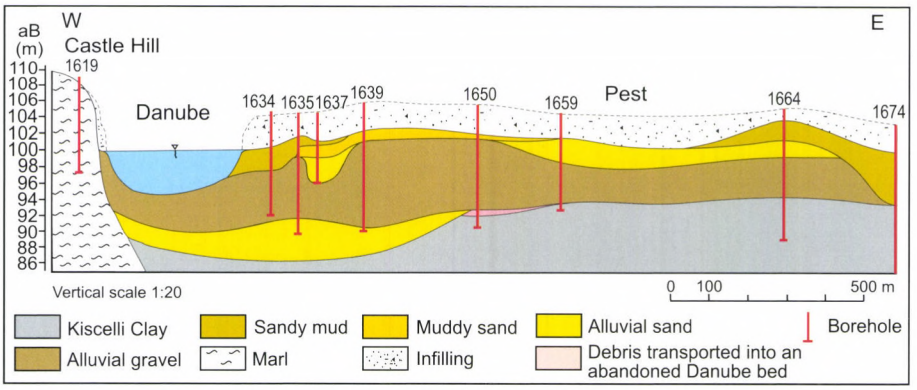
Profile 13. Geological-geomorphological profile between the Rózsadomb and Andrássy Avenue. (On the basis of the borehole data of FTI compiled by F. Schweitzer, 2005.)



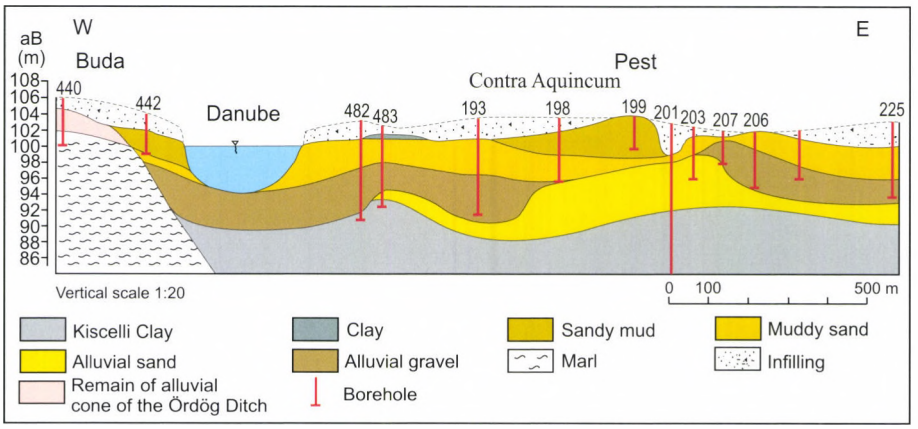
Profile 14. Geological-geomorphological profile between Bem József Square and Kodály Circus. (On the basis of the borehole data of FTI. compiled by F. SCHWEITZER, 2009.)



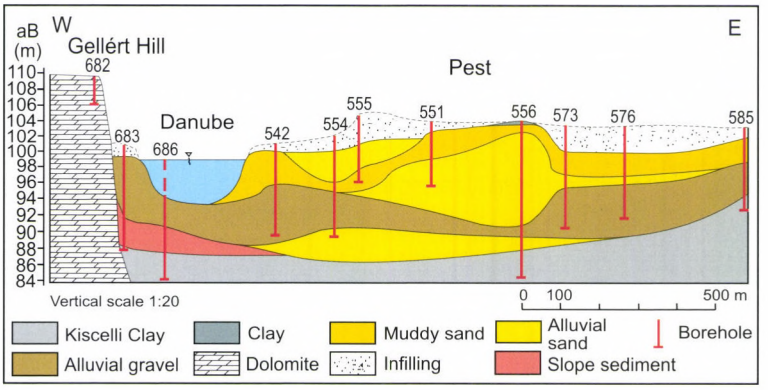
Profile 15. Geological-geomorphological profile between Batthyány Square and Oktogon. (On the basis of the borehole data of FTI compiled by F. SCHWEITZER, 2009.)



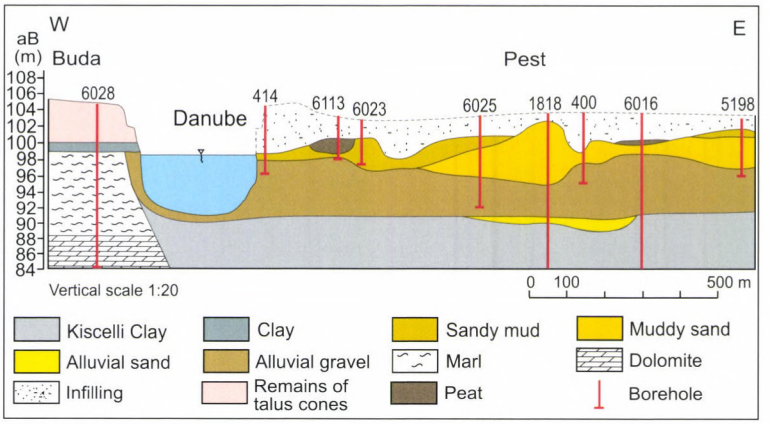
Profile 16. Geological-geomorphological profile between Vár-hegy (Castle Hill) and Klauzál Square. (On the basis of the borehole data of FTI compiled by F. SCHWEITZER, 2009.)



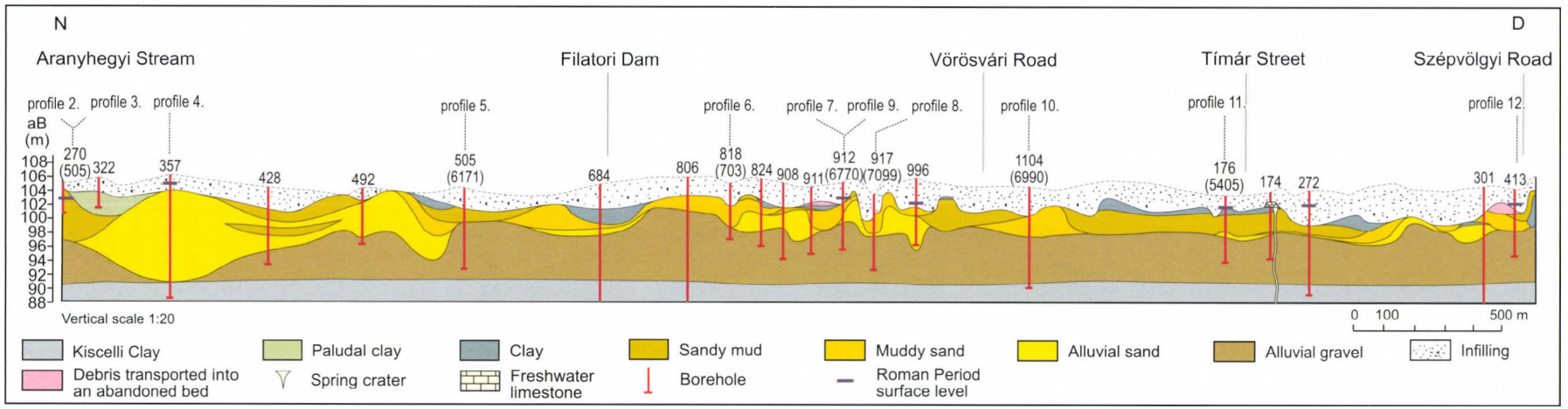
Profile 17. Geological-geomorphological profile between Döbrentei Square and Rákóczi Square. (On the basis of the borehole data of of FTI compiled by F. SCHWEITZER, 2009.)



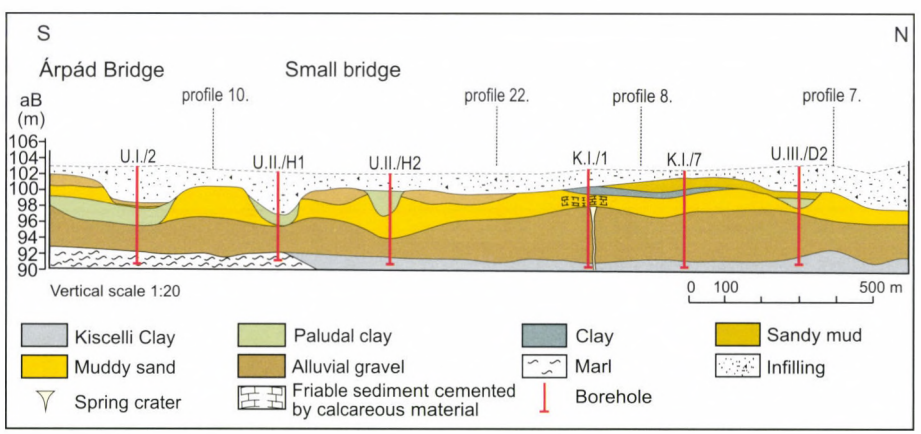
Profile 18. Geological-geomorphological profile between Gellért Hill and Harminckettesek Square. (On the basis of the borehole data of FTI compiled by F. SCHWEITZER, 2009.)



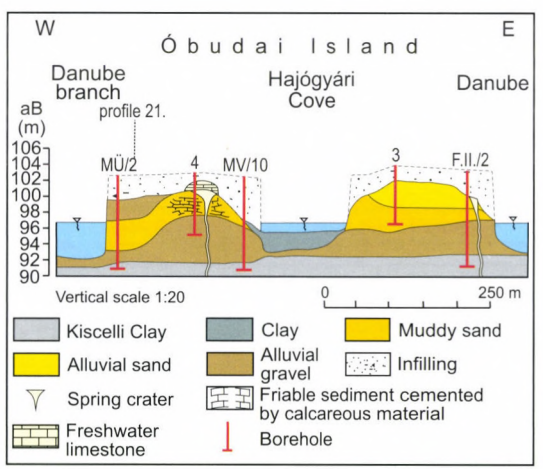
Profile 19. Geological-geomorphological profile between Bartók Béla Road and Ferenc Boulevard. (On the basis of the borehole data of FTI compiled by F. SCHWEITZER, 2009.)



Profile 20. Geological-geomorphological profile between Aranyhegyi Stream and Szépvölgyi Ditch. (On the basis of the borehole data of FTI compiled by F. SCHWEITZER, 2009.)



Profile 21. Geological-geomorphological profile of North–South direction across the Hajógyári Island. (On the basis of the borehole data of FTI, compiled by F. SCHWEITZER, 2009.)



Profile 22. Geological-geomorphological profile of West–East direction across the Hajógyári Island. (On the basis of the borehole data of FTI compiled by F. SCHWEITZER, 2009.)

There are only very few boreholes available from the sections of the Danube bed therefore the representation of the profiles on the maps terminates at these places and where only a few boreholes were deepened the accuracy of representation on the profiles is different.

Bibliography includes only those items which were published in official bulletins. There is, however, an expert's opinion of technical sort, dealing with the area which can be available in the ÉVM Register of Soil mechanics and Hydrology at the FTV therefore also those profiles and drillings are available which were made during the engineering geological mapping of Budapest directed by the chief geologist Mrs T. Fodor (Central Geological Office, KFH). During this work between 1970 and 1975 geomorphological profiles and maps were drawn in the GRI HAS under the guidance of Jenő Szilárd and Márton Pécsi (PÉCSI 1981). Borehole data from the Kis Island at Óbuda were provided by the Metropolitan Civil Engineering planning Company (FÖMTERV) and they were thankfully used. Geological-geomorphological longitudinal profiles present subsurface layers by using a uniform legend and key of colouring.

2.3.1. Morphological types of mountain relief

In several cases relief types of mountains and of their foreland are separated from the erosional-accumulational plain of the Danube by a steep scarp. In the area studied the remnants of horsts and plateaus, can be divided into two genetic types on the basis of their orographic position, structural-morphological character, uncovered or buried fashion as well as on the basis of relief forming processes.

1. Completely covered horsts in threshold position (e.g. Rókus Hill). They represent the relief types of buried horsts, in this case covered by a sheet of Tertiary and Quaternary sediments, and being in a marginal position within the mountain. In several cases the Tertiary sediment sheet had conserved the highly abraded tropical morphological features.

2. Partly exhumed monadnock horsts in threshold position (e.g. Mátyás Hill, Rózsadomb). They are surfaces buried at the beginning of the Tertiary, and after having partly been exhumed, truncated and transformed by pedimentation processes, again in the second half of this period. These are the remains of relief forms along the eastern margin of the Buda Hills, that markedly differ from their environment.

The morphology of the range of horsts in the marginal areas of the mountains is enriched by the various marginal piedmont benches (e.g. Rózsadomb, Tábor Hill, Testvér Hill) and by the slightly undulating piedmont surfaces which were formed mostly along the boundary between the solid carbonate formations of the horsts and unconsolidated Tertiary formations. The height of these stepped surfaces might be increased by Quaternary loess and loess-like deposits as well as by slope sediments. Their morphological types can be found on the sides of the Mátyás Hill, Hármashatár Hill and on their slopes descending to Óbuda.

On the unconsolidated sediments of the mountain margin slope relief types rich in microforms were developed. On the margins of slopes dissected by erosional gullies and by derasional valleys without water-courses, slope segments affected by slumps and also those exposed to landslides occur. This topography of rough slope segments of variable stability is characteristic of the whole mountain margin. The intensive development of slopes was accelerated by the intensely regressing erosional gullies, collapse valleys and also by the derasion valley system without streams.

2.3.2. Morphological types of plain relief

With its geomorphic activity mainly during Late Pleistocene and Holocene the Danube had formed a terraced plain with varied topography and rich in microforms in the eastern foreland of the Buda Hills, on the right bank and left bank flood plains of the river (*Figure 1*).

The geomorphological features of Aquincum and its surroundings are determined first of all by fluvial landforms of erosion and accumulation. As for their genesis erosional-accumulational surfaces represent the type of alluvial fan plains. The right bank plain of the Danube, divided by low terraces, adjoins the mountain margin as a 1–5 km wide stripe with embayments; its surface might be elevated by sheets of wind-blown sand and by alluvial fans accumulated in the entrance of mountain valleys.

In the section of the Danube on the Pest alluvial fan plain where the river divides the plain

into two parts changes in the direction of flow, the development of bars, the fluctuation of meanders and of distributaries and the development of new ones as well as the partial filling up of the old ones occurred rather frequently before the regulation of the river. These processes resulted in turning of the flood plain into an area dissected by a confused patchwork of partly filled up waterlogged hollows, ox-bows and bed remains.

Within the immediate neighbourhood of Aqincum and its wider surroundings the Danube Valley has two Holocene surfaces. The so-called low flood plain has a relative height of 1.5–3.0 m, whereas the so-called high flood plain (terrace No. I) has a relative height of 4.5–6.0 m. The mountain foreland margin of Pleistocene age has a higher position. In some places the higher Holocene levels form large, continuous surfaces and into this higher flood plain level a confused network of filled up distributaries and hollows is deepened – this is the lower flood plain level. Higher floods can deposit sediments on both levels, while the lower ones do it only on the lower flood plain level.

Scow-channels and rivulets carrying away the flood towards the farther parts of the flood plain or carrying back the water receding from the flood plain to the main channel had a significant role in the formation of the flood plain surface at Aquincum, Transaquincum and Contra Aquincum, especially, as regards the elevation of the surface level going together with the silting up. The low flood plain is deepened by hardly 1.5–3 m into the so-called high flood plain of the homogeneous alluvial fan. On the right bank (Aquincum) the high flood plain level lies 5–6 m above the 0 cm water level of the Danube. Therefore its surface is inundated only by the highest floods. The fluvial sequence consists of gravel, gravelly sand and alluvial sand.

These sediments had been cut by most of the boreholes deepened for mapping (HORUSITZKY 1920, 1933, FTV 1971). The material of the gravel assemblage consists mainly of quartz, certain kind of quartzites, limestone, sandstone, quartzite schist, gneiss and phyllite. Granite, granitic aplite, quartz porphyry and andesite are the most important rocks of magmatic origin. In the mineral composition of fluvial sediments first of all magmatic, metamorphic and epigene materials dominate (TÖRÖK 1971) (*Figure 6*).

The fluvial sand assemblage is also very important. It is well sorted, splintered, coarse-grained, even a grain-size of 2 mm occurs occasionally. The 2–6 m thick fluvial sand is underlain by gravel.

It is worth to mention sandy silt and silty sand sediments, called by some experts as loess silt, having formed in the Early Holocene in the deposits overlying fluvial gravel and sand formations covering the flood plain levels which At that time were still in a low flood plain position. They include krotovinas (burrows of soil-dweller small mammals) cemented Together later by calcareous solutions and filled by chernozem soils. These are covered by a 0.3–1.5 m thick chernozem soil suggesting that these terrains used to be inundated by floods only rarely.

Terrace No. II/a (at an altitude of 102.5–104 m aB) was flood-free. Beside the higher flood

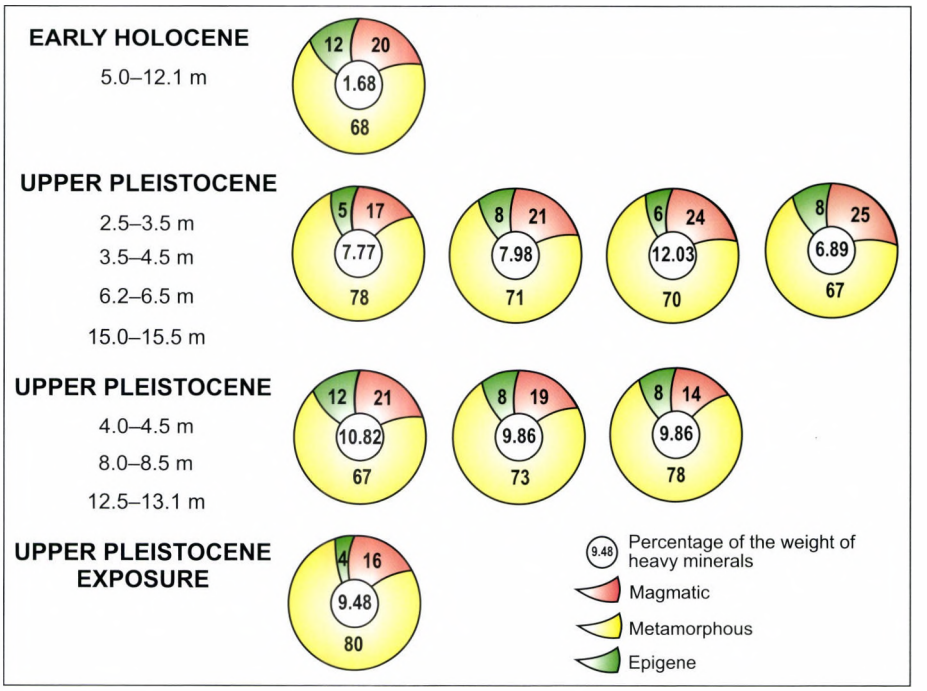


Fig. 6. Mineral composition of Danube sediments (after Endre TÖRÖK, 1971)

plain level the Roman Period settlements, aqueducts, watch-towers as well as the limes road were built typically on this terrace. Its surface was covered and slightly elevated by freshwater limestone, travertino having precipitated from karst springs (Rómaifürdő, Attila Spring, Császár Baths, Filatoridűlő, Kis Island, etc.) (*Figure 7*), and in drier periods also by wind-blown sand in the form of 20–30 cm thick sand sheet, sand dunes, and coastal dunes. As a result the terrain reached an average altitude of 104–106 m aB. This sand was blown out of those islands which initially were bars and from point bars which had become dry steadily (*Figure 8, Picture 9*).

On the higher levels, i.e. on the higher flood plain, which emerged 9,000–11,000 years ago according to 14C datings (terrace No I) or on the terrace No.II/a which developed 26,000–32,000 years ago, some minor, 1–2 m deep deflation hollows and flat had been formed by the wind action. These surfaces are covered by sand with a slight humus content, a skeletal soil. Roman Period remains, can also be found on them.

Prior to the flood control measures larger or smaller bar islands had frequently occurred in the main channel of the Danube, some of them being in a stage of progress, while others in that of decline (e.g. the Margaret Island with two members earlier, the Óbudai Island consisting of the Nagy and Kis islands, Fürdő Island, Palotai Island, Nép Island, Pap Island). During the excavations and in boreholes it it could be frequently observed that the main channel had undercut the concave side of the higher flood plain level as the bank is steeper there. This can be seen e.g. in the Roman Period riverside sector of the area in the Gas Factory at Óbuda, where the destruction of the riverbank could be stopped only by its protection or by embankment construction (ZSIDI 1999/1, *Picture 10*).

Where the riverbank is convex flat flood plain levels and those at different altitudes usually run parallel to each other, forming belts. Here broadened flood plains develop as a result of the joining of point bars. They are built up and raised by the load of highest floods and in drier periods by sand transported and deposited by wind.

This planates surface unevenness and raises the level. Surface segments of this kind can be found in the Római part (beach) along the Nánási Road and in the Nagy Island at Óbuda (*Figure 8, Picture 9*).

It is suggested that the Romans had realized the role of the point bars in preventing the expansion of inundation. It is possible that they used the water flowing out gradually through the mouths of the point bars. Thus they tried to contribute to the food supply of the population grown in number, and they applied some sort of traditional flood plain farming, by using scow-channels. It is more important, however, that by tapping of inundation through the scow-channels they could regulate the water level of floods, using the inundated area as a natural reservoir.

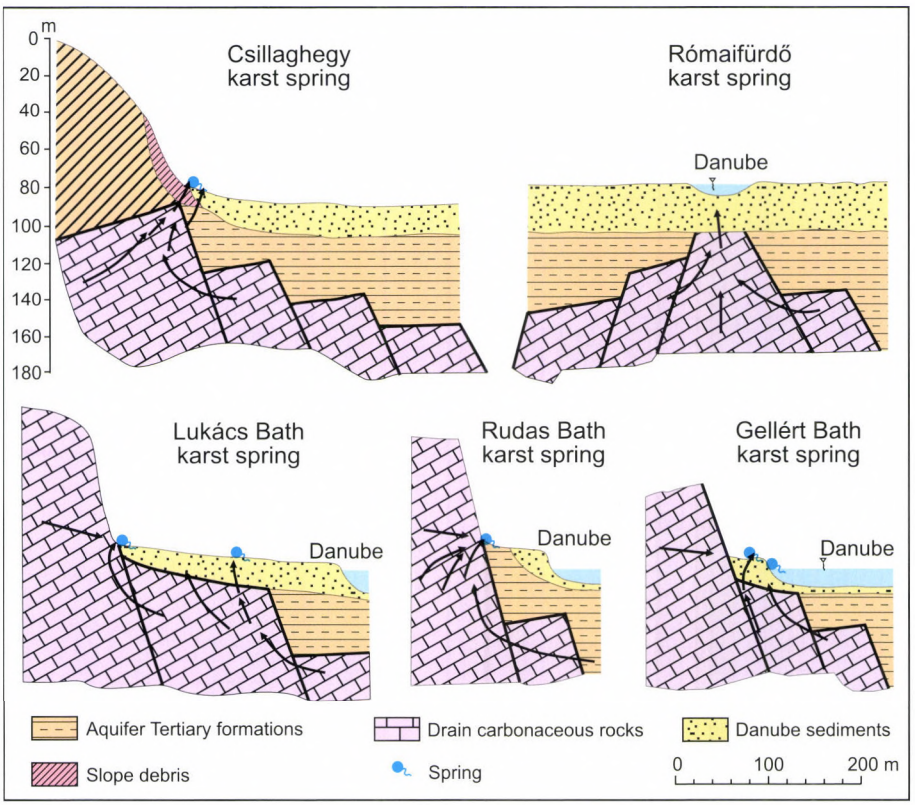


Fig. 7. Sub-types of karst springs at Buda and the geomorphological position of their sources (Gyula Scheuer – Ferenc Schweitzer, 1978)

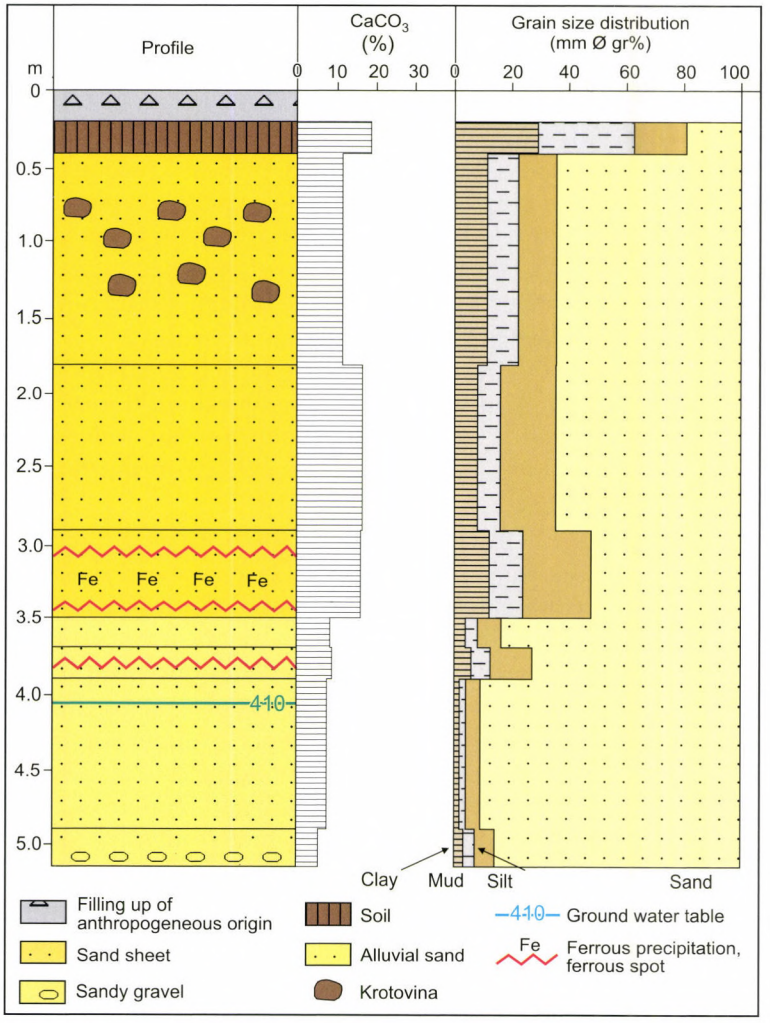


Fig. 8. A profile of a point bar along the Danube in the Óbudai Island (István Viczián – János Balogh, 2009)

The cut-off beds became separated while other beds collected waters arriving from the mountains and there are some indications that the Romans conducted the water of affluent creeks rising from the nearby mountains transporting mostly dolomite debris into the deeper branches or swamps in order to get as many lands as possible and as soon as possible. These areas were probably situated in the present-day quarters of Mocsárosdűlő and Filatorigát and in their environs.

Picture 9. The sand of a point bar in the Óbudai Island. The alluvial sand is overlain by wind-blown sand

Picture 10. On the surface consisting of greyish yellow sand with loessy silt the Roman Period bank section running parallel with the Danube is clearly discernible as the dark stripe also enclosing the embankment.

3. The reconstructed paleoenvironment of Aquincum

In order to reconstruct the paleoenvironment of Aquincum in the first place it was necessary to get a knowledge of the main climatic conditions characteristic of the time because the formation of different soils always depends on the climate, relief and parent rocks. As for the latter two a relatively thorough knowledge has accumulated by now, after reconstructing climatic conditions the main types of soils could be defined and on this basis the typical plants determined within the area in concern. Based on the resulting environment types a mosaic-like schematic environmental reconstruction of Roman Period Aquincum has become feasible.

3.1. Climatic conditions

No accurate knowledge has been gained so far on the climatic conditions of Aquincum in the 1st through 3rd centuries AD. It can be explained first of all by the fact that palynological analyses, geological and dendrochronological investigations made on the material of archaeological excavations which could provide the basis of climatic studies, have become regular only during the last decade. That is why no sufficient amount of data is available about the studied area for the time being. It is worth to compare the results of scientific studies with those of archaeological researches made in the area.

From phytogeographic studies and palynological analyses (ZÓLYOMI 1952, 1958) we know that the cooler and humid Bükk II climate phase gradually changed into a period of a drier and warmer character („Roman Period climatic optimum", KOPPÁNY 1981).

The annual rings of oak wood samples from archaeological excavations near Aquincum – and also from several other sites all over Pannonia – are situated very close to each other suggesting that during the first phase of the Roman Period the climate had turned dry in the region.[3] Results of recent studies suggest a submediterranean climate, similar to the one in present-day Northern Italy, which could have changed at around the turn of 2nd and 3rd centuries AD. However, at present only some sporadic archaeological data are at our disposal to support this hypothesis. Several villas and cemeteries from the Roman Period near Lake Fertő and Lake Balaton are covered by water in our days as some parts of forts of the limes are as well. A lower water-level in the Roman Period can also be explained partly by climatic causes.

The so-called lock-gate of Galerius found at Siófok raises an intriguing question. It may suggest that some human control of the water-level of Lake Balaton already existed in the Roman Period.[4]

Though at present these are mere hypotheses, some phenomena can be mentioned also from Aquincum in this respect. Present-day studies generally attribute them to historical events and to changes in the way of life. For example during the construction boom which took place in the cilvilian town in the period of prosperity under Septimius Severus, not only public buildings but also dwelling houses had been rebuilt and modernised: the increasing number of inhabitants made necessary the division and building in the earlier spacious, larger-size insulae with some open-spaces.[5] Earlier these blocks were not built in completely or at that time there were fewer dwelling houses with larger ground-space and perhaps courtyards.

The so-called closed, long-house type of dwelling-houses had become widespread at that time. Though this can be explained chiefly by practical considerations and by the thriving town, the role of climatic factors must not be ignored either: it is clear that the gradual setting in of a cooler and more humid climate from the beginning of the 3rd century AD onward, had made necessary certain alterations in the ground-plan of houses. Only a very small number of the dwelling houses known from the Civil Town represented the classic house type with atrium or peristylium, most of them belonged to the long-house type, closed outwards.[6] In a lack of studies on construction phases for the time being, however, it is not possible to determine the age of the emergence of „classic" house types and, similarly, it is not known whether they were rebuilt at all later.

[3] For a summary of wood materials from Aquincum see LÁNG – GRYNAEUS 2005.

[4] GRYNAEUS 2004, 961–998.

[5] ZSIDI 2002/4, 49.

[6] For the house types: ZSIDI 2002/4, 76–77; 2006; 2008; LÁNG 2008.

At present the above mentioned observations neither could be confirmed nor discarded, since no conclusions have been supported so far from the archaeological side. Information of this kind can be expected first of all from the study of the ground-plan and of other elements of the remains of buildings (e.g. the more frequent occurrence of closed dwelling house types, of heatable buildings, rooms). Though the dating and periodisation of remains of buildings which came to light during the excavations in Aquincum over more than 100 years were associated reasonably first of all with the important historical dates and periods concerning the seat of the province, it is possible that climate change also had its part to play in the remodelling activities.

W. Vetters dated the beginning of the cooler and more humid period to the last quarter of the 2nd century AD. According to him the humidity and coldness of that phase was enhanced by the large quantity of dust which had been emitted into the air during the eruption of the Taupo volcano in New Zealand in 186 AD (VETTERS 1994). Searching for the archaeological proofs of the climate change H. Zabehliczky found among others marks of floods and evidence of raised floor levels within settlements. North of the Danube, at Bernhardsthal, several Germanic settlements (23 out of 29 ones) lying in a low, and consequently, in a threatened position in the river valley, were destroyed around the turn of the 2nd and 3rd centuries AD. In the first half of the 3rd century AD they already did not exist. Among settlements established on higher levels this ratio was more favourable (32 settlements from 33 ones survived). He explained this phenomenon – in support of the earlier opinion of Vetters – by the deterioration of the climate and with the rising of the ground water table. He evaluated the exchange of miltiary garments for a warmer one and the spread of floor-heating in dwelling houses as cultural effect of climatic change (ZABEHLICZKY 1994).

Research methods of natural sciences having been increasingly applied at archaeological excavations recently and their results would hopefully contribute to a more exact interpretation of certain archaeological phenomena.

The above described climate conditions of Aquincum were somewhat modified by local factors as well. Different parts of the area, situated at the boundary between the mountains and plain: mountain slopes, piedmont surfaces, valley entrances, terraced surfaces can be characterized by environment types rich in meso- and microclimates. Generally it can be stated that except extreme climate events climatic conditions were favourable for peoples living there.

In addition to general hypotheses and data concerning the reconstruction of climate it can be said that the main features of climate in the Roman Period did not differ considerably from those of present-day climate, consequently the same conditions are also valid for soil formation.

3.2. Soils and vegetation as a function of topography

The characteristic soils of the mid-mountain background of Aquincum and its neighbourhood were first of all lithosoils, settled on barren surfaces with scanty vegetation, the rendzina which can be characterized by karst scrub forests and also the brown forest soils with clay illuviation in the valleys and Northern slopes covered by closed oak and Turkey oak forests. On the piedmont parts the height of which was added by slope loess, Ramann's brown forest soil also appeared providing excellent conditions for viniculture.

On flat surfaces with small differences of elevation, higher terraces affected by the Danube, with medium ground water table and with more extreme and drier ecological conditions, soils of chernozem character had formed. Before the Roman Period these parts had been covered by the plant communities of steppe meadows and grassland with sand soils (wind blown sheet – Római part), forest steppes, and of oak forests on sand soils.

Infillings of beds containing paludal silt, muck and peat accumulated over a long time testify to the earlier presence of Old Holocene river branches (Mocsáros) which were created by the dynamic change of the Danube channel.

The lower flood plain levels formed by the floods of the Danube with their alluvial and hydromorphous soils provided a favourable habitat for flood plain forests. Regular floods contributed to the silting up of terrains where a vegetation characteristic of silty environment and flood plain weeds grew. According to our knowledge the vegetation of the area in the Roman Period in general outline of characteristics could be similar to the present-day one.

3.3. Environment types

Paleogeographic conditions of Aquincum in the 1st through 3rd centuries AD were dependent on the current regime of the Danube. With its effect on ground waters, by the repeated inundations of its abandoned bed the river had created a varied ecological environment. Ecological patterns were determined primarily by the structure of relief (lower flood plain level, higher flood plain level, plains of higher terraces, piedmont surface, mid-mountain type horsts), by the frequency of the water stages of the Danube (that is the frequency of low, medium and high stages) as well as by the ground-water effect related to water stages.

Interpretation of the data available on natural-ecological factors (relief, hydrography, soil geographical and phytogeographical characteristics and settlement environmental conditions, etc.) has led to the establishment of the following reconstructed environment types in the area of Aquincum and its surroundings (*Figure 9.* A–G).

– The main channel of the Danube and its branches

It is an ecotype being in the state of constant change, its development is determined by the quantity of water flowing dynamically. With its floods the Danube had shaped its banks in a radical way, constructed bars or destroyed them, formed a series of islands. The latter ecofacies can be characterized by plant communities with pioneer willow bushes, flood plain forests accompanied with willow-poplar gallery groves. Flood plain forests had been sustained not only by inundations, as on the flood beds alluvial skeletal soils had formed (*Figure 9.* A).

– Lower flood plain level with hydromorphous soil and high water stage

Prior to the flood control measures the flood plain with a dense network of one-time beds was a scene of continuous alteration of beds because annual regular floods used to inundate them for shorter or longer periods. Depending on the length of time and frequency of inundation several types of flood plain

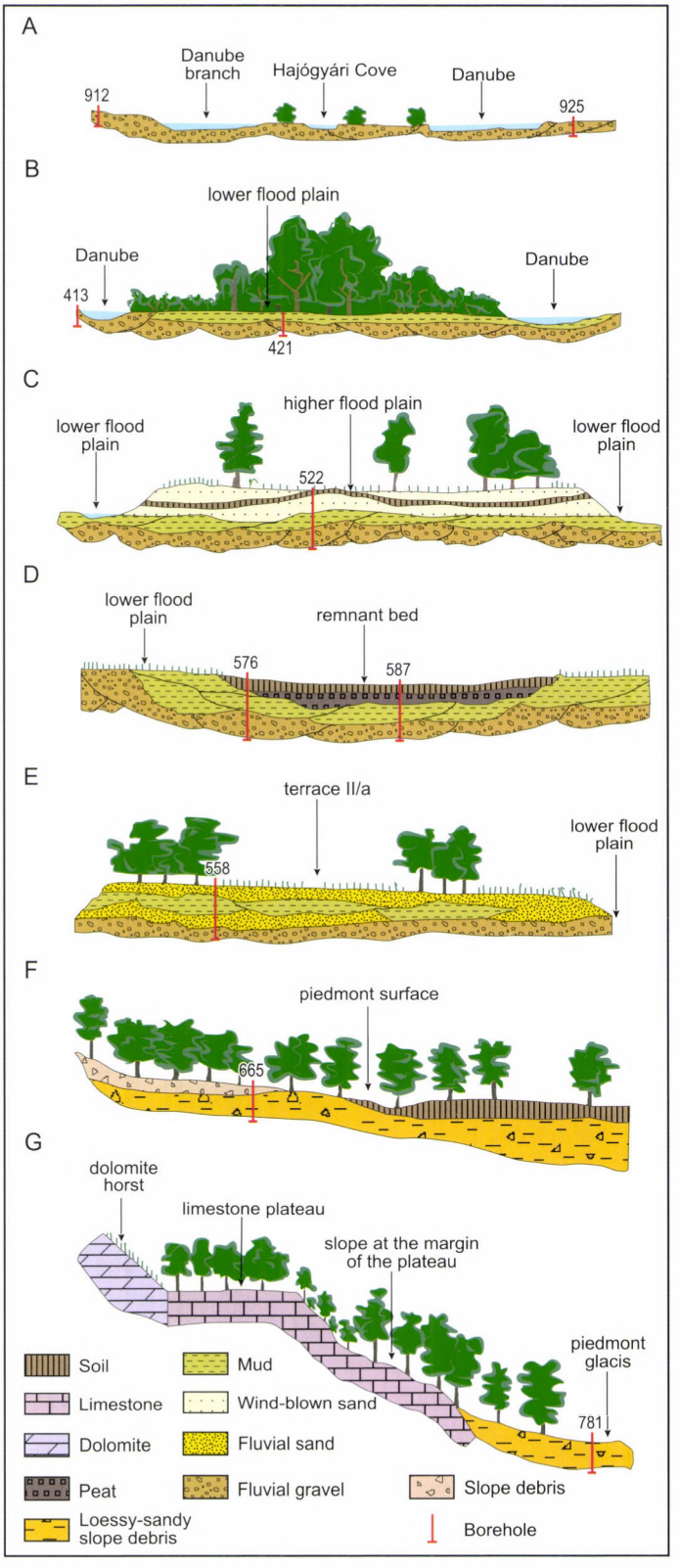


Fig. 9. Generalized ecological conditions of surfaces with different spatial position (Ágoston Juhász, 2005). – A = Main channel and branches of the Danube; B = Lower flood plain with high ground water level; C = Upper flood plain level with medium ground water level; D = Bed remains; E = No. II/a terrace islands; F = Piedmont slopes; G = Horsts, plateaus

vegetation (willow-poplar gallery forests, willow groves, willow bushes) occurred. Now only some island-like remains of them exist, alluvial and meadow soils refer to their former distribution area. Their ecofacies (remains of beds affected intermittently by water, with swampy, boggy and reedy vegetation) were characterized by an intensive filling up, nowadays muck, and paludal soil formation mark their earlier occurrence (*Figure 9.* B).

– Higher flood plain level with gallery groves, with medium ground-water level, chernozem and sand soils

In contrast to the above-mentioned geoecotypes this one represented the oak–elm–ash gallery forest of flood-free surfaces. Its higher geomorphological position, compared to the one of its environment, the lower ground water table meant also that this ecotype provided acceptable conditions for settlements. Especially those upper flood plain level surfaces were suitable for settlement where the silty-sandy sequences of layers had been raised by wind blown sheets. By now there is a domesticated open country on their loose, well aerated soils (chernozem, meadow chernozem, sand soil). On the other hand the intense urban sprawl resulted in built-up areas that once had been under cultivation. In the Roman Period its vegetation was characterized by sandy steppe vegetation and a forest steppe of mosaic pattern (*Figure 9.* C).

– Filled up remains of one-time beds of the Danube, intermittently inundated, with marshy sedge vegetation

The Early Holocene branch of the Danube can be traced from Békásmegyer up to the Margaret Bridge. During the highest floods of the Danube this branch supposedly had entered into contact with the main branch in the 1st through 3rd centuries AD. Its ecofacies could be characterized by remains of beds alternating with waterlogged sections, bog meadow, desiccating marshes with sedge vegetation. Near the present-day quarters of the town called Rómaifürdő, Mocsárosdűlő, Kaszásdűlő, Filatorigát they represented a patchwork of flood plain environment (*Figure 9.* D).

– Terrace surface with forest steppe, chernozem and sand soil cover (terrace No II/a)

This geoecological type can be characterised by medium ground water level, raised by airborne dust sediments, wind blown sand, by the series of alluvial fans of minor streams and was covered mostly by chernozem and brown forest soils. Having excellent conditions for settlements this ecotype provided favourable conditions for the Roman expansion. The varied spatial distribution of its soils suggests the existence of a forest vegetation of both closed and mosaic pattern. Some modified soil profiles prove that these areas were partly under cultivation. Today this type can only be studied in fragments. Terrace surfaces No II/a, II/b and III are found along the mountain margin forming a narrow stripe (*Figure 9.* E).

– Piedmont slopes with oak and Turkey oak forests, covered by brown forest soils

Being a special ecotype of piedmont surfaces adjoining to the marginal horsts of the Buda Hills it is rich in ecofacies. The gently sloping parts of mountains once were covered by extensive oak and Turkey oak forests settled on slope deposits and loess as parent rock. Forest clearings of more recent centuries gradually reduced the forests settled on brown forest soils. At the beginning their place was occupied by agriculture and viticulture but during the last century the rapidly expanding capital city incorporated these areas, having thus created a suburban residential district (*Figure 9.* F).

– Horsts and plateaus with karst shrub woodland and karst oak forests

They are the most varied terrains of the margin of the Buda Hills, richest in ecofacies. Their topography can be characterised by a diversity of surface rocks (dolomite, limestone, slope sediments, marls, etc.), a specific areal distribution of soils, low ground water table, a wide variety of microclimates depending on geomorphic features and even more by the diversity of the types of quasi-natural plant associations (*Figure 9.* G).

3.4. Water-courses and springs in Aquincum and in its environs

Based on the data gained from excavations and boreholes as well as from the literature it can be stated that the area abounded in water-courses and springs. Due to the diversity of geomorphic features shaped by the formerly Danube beds and their spillstreams, such as the terrace islands and bars were the places where settlements, roads, bridges, etc. were built. The contemporary pattern of the river beds, ox-bow lakes and spillstreams of that period suggest

the existence of a drainage pattern thoroughly differing from the present-day one. Prior to the Roman Period the channels of north to south orientation which can be detected now on the right bank of the Danube in the line of the quarters of Mocsárosdűlő, Filatorigát, Kaszásdűlő were filled by flows being in connection with the main bed (*Figure 10*), similar to the network of beds in the Pesti Plain during floods.

Due to their position the islands surrounded by the main channel and other branches of the Danube were places suitable for the development of ice-packs. The water dammed this way could cause great devastation and even it could re-occupy the former beds of the Danube. In several excavations and exposures, e. g. in those at the Governor's palace, 10–30 cm thick gravelly and sandy sediments deposited by large floods of this kind were found in the profiles of trial trenches.

The data acquired from the geological-geomorphological sections, the position of islands near the left bank of the Danube, the mouth and alluvial fan of the ancient Rákos stream having been situated East of the present-day bed, suggests that one of the main branches of the Danube, perhaps the major one, was situated East of the present one, at Káposztásmegyer, in the place of the present Óceán Ditch.

Between the Mocsáros at Békásmegyer and the Óceán Ditch were formed those islands on which Late Neolithic, Copper Age, Bronze Age, antique and later medieval settlements had emerged. In the Roman Period the upper part of the Margaret Island and the Fürdő Island were probably connected for some time intervals.

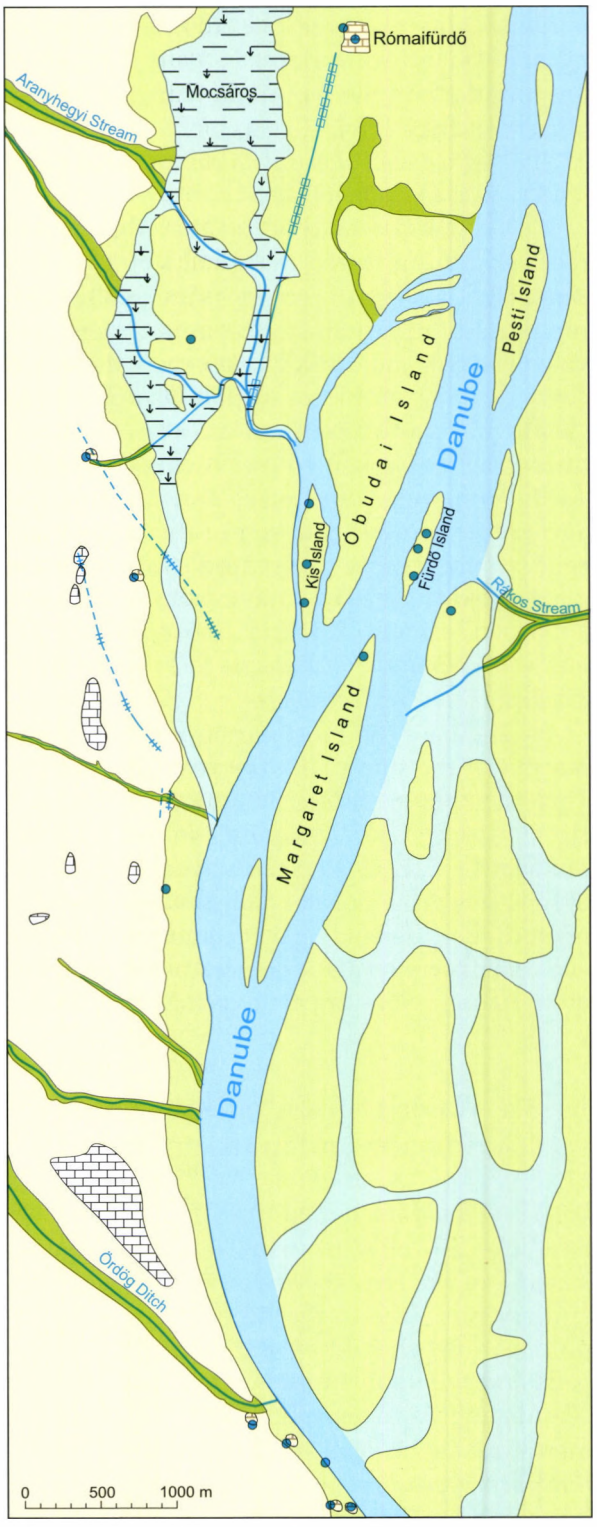


Fig. 10. Hydrographic map of the wider surroundings of Aquincum in the Roman Period (Ferenc Schweitzer – János Balogh, 2009)

The hand-written survey made by G. MOTSY in 1818 (*Figure 11*), also suggests that the channel line of the Danube had shattered the Northern third part of the Margaret Island, that used to be uniform before the Roman Period. The later Fürdő Island was preserved by freshwater limestone which covered its surface thus saving it from further erosion. To secure navigation routes the Fürdő Island was removed between 1872 and 1875, but negative mills spring in this place up to now.

József SZABÓ (1857) published a description of the thick, yellowish white freshwater limestone which protected the Fürdő Island from erosion. Spring sediments in similar morphological position came to light during an excavation in Szőlőkert Street (see chapter 5.2.) (*Picture 11*). A Roman bridge which linked the military town and Transaquincum leading through the Fürdő Island was preserved by this limestone layer.

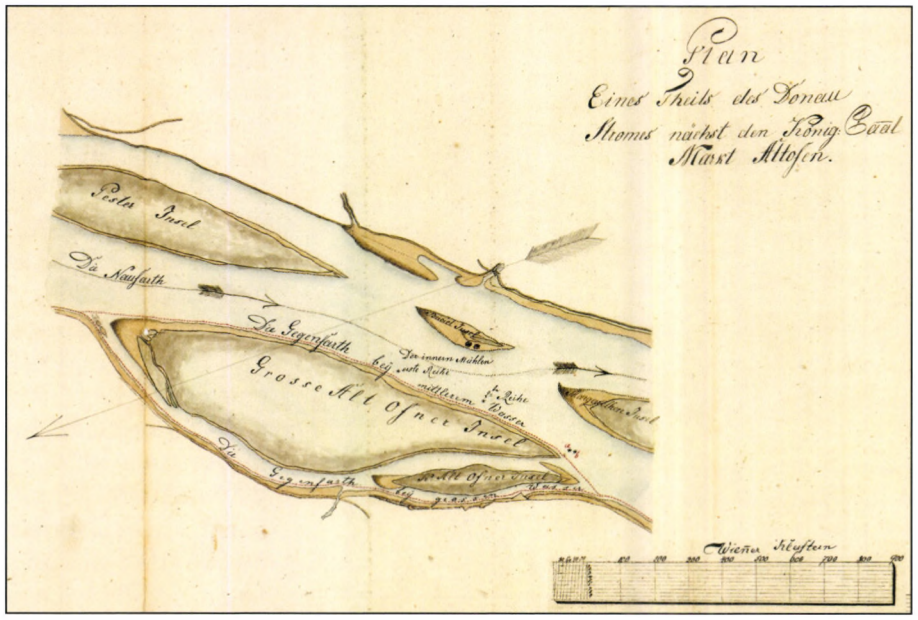


Fig. 11. Hand-written map of the Danube section along Óbuda (G. Motsy, 1918). The position of bars suggests that there might be connection between the Margaret Island and Fürdő Island in pre-Roman times (MOL maps of Council of Governor-general, S 12 Div 13 No 483)

Picture 11. Yellowish white sediments of a karst spring formed by 1–2 cm thick ridges precipitated on the sand surface in the excavation at Szőlőkert Street. The surface was cut by the graves of a later cemetery

Among conditions favourable for human settlement there should be mentioned those thermal springs and groups of springs (*Figures 7* and *10*) which were active at that time as well. Some of them rise from the terraced plains of the Danube (Rómaifürdő), others do from the bar islands, or are found in the zone between the mountains and the plain (Árpád Spring, Attila Spring, and the groups of springs of the Rudas, Császár and Lukács baths). The role of hot springs was important in the life of the settlements all the more because they did not froze in even at winter time.

As for its origin their water is primary karst water. There must have been almost 200 springs. In some clus-

Picture 12. Springs at the foot of the Gellért Hill. At low water stage the remains of the horst from which the thermal waters spring forth are discernible

ters of springs (eg. in those ones which rise in the foreground of the József Hill) approximately 40–50 springs were rushing up in the 1850s. Karst springs are found in a great number at the Northern end of the Margaret Island, not to mention the negative mills (at the western bank of Margaret Island, at Gellért Hill, between the Erzsébet Bridge and Szabadság Bridge, in the vicinity of the Batthyány Square) (SCHAFARZIK 1920) (*Picture 12*).

A similar situation prevailed at Rómaifürdő (*Figure 12*) where 20 larger or smaller springs or groups of springs still existed at the beginning of the 1930s. From these shallow lakes with a depth of 1.2–3 m, described by F. Schreier (1932), along with the greyish white coloured travertines whitish yellow coloured sulphurous-calcareous sediments as well as the so-called „liver of sulphur", a yellow sulphurous mud came to light from boreholes and from the bottom of lakes (SCHREIER 1932). Unfortunately litera-

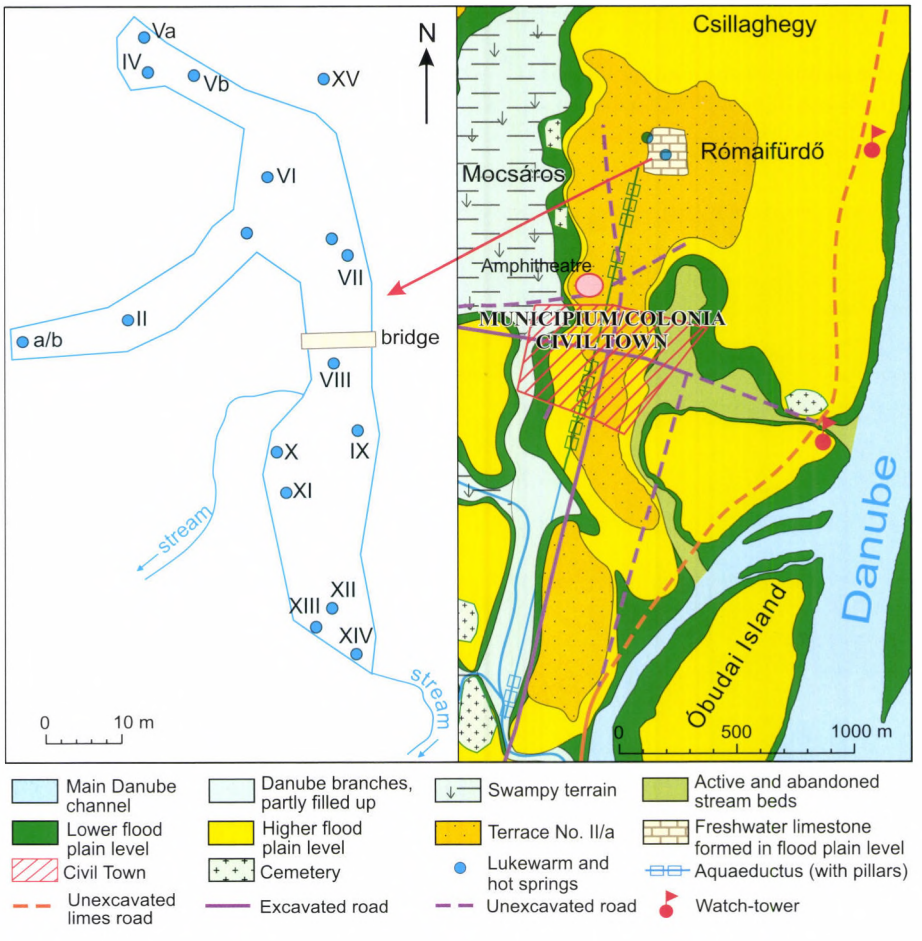


Fig. 12. One of the numerous groups of karst springs at Rómaifürdő which played an important part in the everyday life of Aquincum (after Ferenc Schreier, 1920)

Picture 13. Sulphide precipitation of springs on the Kis Island at Óbuda

Picture 14. Remains of the Roman Period aqueduct (*aquaeductus*) supplying the Civil Town and the Military Town with water and its short reconstructed section

Picture 15. The so called well house No. 3 excavated in the area of Római Strandfürdő

ture has treated these descriptions rather adversely ever since (*Figure 3, Picture 13*). They had been deposited usually within smaller ponds or larger lakes (with a depth of 0.5–2.3 m) by breaking through the alluvial silty-clayey-gravelly sediments or by spreading over the uneven parts of the surface, in this way cementing them.

A large number of spring lakes of similar depth could be observed on the territory of Aquincum at the one-time Filatoridűlő, on the Kis Island, during the excavation made in the place of the former gas works and also in several other places as well, where baths and villas might occur.

The quantity of water which had reached the surface in the Roman Period can only be estimated. The data by V. Zsigmondy were used for this estimation because at his time karstic water was exploited to a lesser extent than nowadays (ZSIGMONDY 1866). The total yield from the groups of springs could be 8,000 m^3 per day as an average. In the Middle Ages the water of springs was used also to operate mills, which suggests a rather high amount of karst water discharge.

If we consider the number of inhabitants in the Roman Period (about 40,000–45,000 individuals together with the 6,000 persons as the effectives of the legion) both the water discharge and the use of water could be considerable. The total yield of springs at that time could be nearly 42,000 m^3 per day.

In the Middle Ages a lower and an upper hot water („aquae calidae superiores et inferiores" were known proving that the inhabitants of the region were familiar not only with the lukewarm springs of 17–26 C° but also with the hot waters of 33–65 C° at the Gellért Hill and József Hill. These names are well known in Hungarian literature as „alhévíz and felhévíz". The boundary between lukewarm and hot springs is associated with a tectonic line running along the Kis Island at Óbuda, the Fürdő Island, the Northern part of Margaret Island as well as the vicinity of Transaquincum (present day Dagály Bath) and the one-time mouth section of the Rákos Stream.

The main branch and aqueduct system of the aquaeductus providing water supply for the Civil Town and military settlement of Aquincum led the water of springs situated at about 2.5 km away from the Civil Town, following a strict North to South direction (FOERK 1923) (*Pictures 14* and *15*). These springs are in the area of the Római open-air baths.

The quantity of water yielded by springs, however, was not sufficient for the inhabitants as their number had increased. Therefore several aqueducts on pillars and with pipes made of ceramics, running within walls, had crossed the military town in a North-West–South-East direction. It is probable that besides the water of springs at the foot of the Buda Hills that of the springs rising at Csillaghegy and Békásmegyer were used as well as the water of numerous thermal springs with sulphur content that have been less known so far (Kis Island, Fürdő Island, Rómaifürdő). The water of these springs could be used for medical purposes, too.

From the gravely-sandy layers of the surface of the terrace No II/a located West and South of Aquincum and from the surfaces of the higher terraces of the Danube springs fed by ground waters and contact springs are known (*Figure 10*). Within the section from the Solymári Valley to the Szép Valley mostly loess and slope deposits cover the underlying impermeable Kiscelli Clay. Their surface was dissected by gullies, minor valleys less developed than nowadays which indicates landform development during the nearly 2000 years since the Roman times. Previously, including the Roman Period, there were intermittent or permanent water-courses in them fed by atmospheric precipitation. A section of a ditch of this kind with a length over 200 m was recovered to the South of the Military Town (see chapter 5.5.1.).

Ground waters within the terrace No. II/a and higher flood plain could be an important water source had it not been contaminated because of the inadequacy of sewage disposal. Ditches, drainage canals with water flowing freely (*Picture 16*) by all means played a role of sewers in areas outside of the military settlement and Civil Town. Because of the large number of inhabitants a high quantity of wastewater emerged in the towns (the water of public common wells, that of the baths, sewage water, etc.). To transport this substantial quantity of water directly into the Danube or into one of its branches, the use of gravitational drainage ditches was necessary. Supposingly, until the end of the Roman Period in the case of the Civil Town the water-courses running from the Mocsáros to the Danube (Rádl Ditch, Aranyhegyi Stream) while in the case of the military settlement a natural or artificial branch having straddled the Kis Island from the west could be the recipients of wastewaters.

Picture 16. Open drainage canal of North–South direction in the Southern foreground of the Civil Town. Later, when the function of the place had changed it was filled back and a grave was dug into it

3.5. Some reflections on the Fürdő Island and on the Kis Island at Óbuda

A large number (50–60) of individual springs or groups of springs was observed in the middle of the 19th century in the Fürdő (one-time Hungarian 'Feredő') Island which was situated in the main branch of the Danube between the Óbudai Island and the one-time mouth of the Rákos Stream (SZABÓ 1857, HAUER 1867). According to the survey made by József Szabó in 1856 the island was 284 fathoms (540 m) long and 57 fathoms (108 m) wide (*Figure 13*). The springs bubbled, their temperature was 41–42 R (51.25–52.5 ºC). Sometimes the water of the springs was pellucid, potable, and slightly acidic. At the same time some groups of springs, the water of which was accumulated in smaller ponds had deposited a „yellow coloured ferrous ochre with sulphur, and lime mud". The water

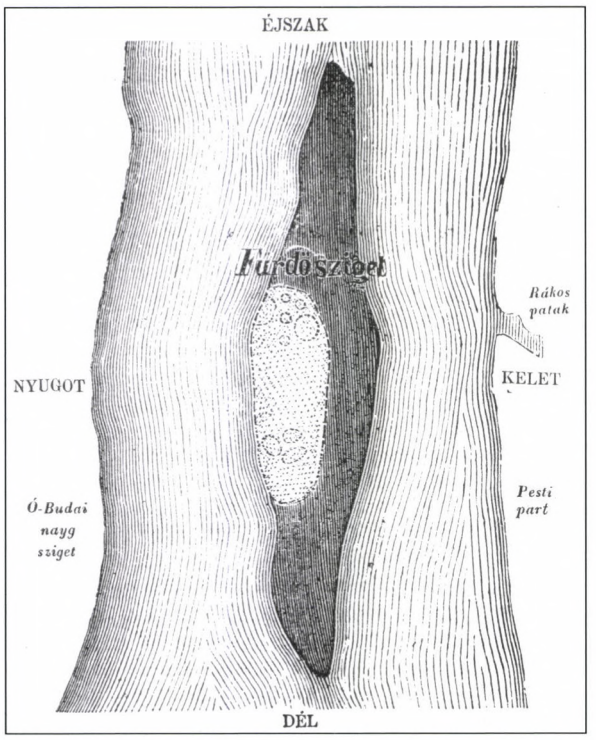
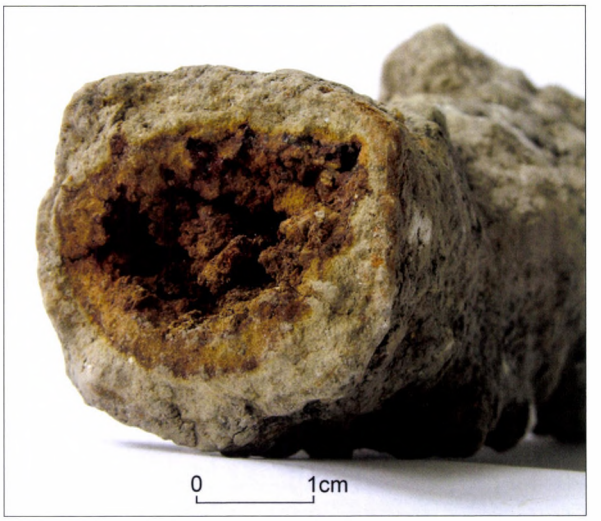


Fig. 13. The Fürdő Island between Buda and Pest (József Szabó, 1857). On the Fürdő Island hatched boundary indicates the whole area of springs while encircled dots indicate the main groups of springs

overspilling from spring lakes had flown down to the Danube on the western and eastern banks of the island. This suggests that the Fürdő Island was either a separate islet or it was adjacent to the Margaret Island from the North, but it by no means belonged to the Óbudai Island as it was supposed e.g. by F. Salamon, an author of the ancient history of Budapest. It is because the nature of bars is a downstream wandering. We may suppose that in the Roman Period the Fürdő Island and the Margaret Island were adjoined together by a low bar. Within this section of the Danube there are several thermal springs appearing as negative mills even nowadays.

In his description on the town of Pest F. Schams (SCHAMS 1821) and in a report on the Fürdő Island Linzbauer (LINZBAUER 1837) remarked that most of the springs „with their smell and their nature to stain yellow their environment testify to the considerable sulphur content". The importance of this remark has to be emphasized because except the works of SCHREIER (1932), GEDEON (1934) and SZABÓ (1856) special literature did not deal either with passages of springs filled in with such sulphurous sediments with lime mud or spring lakes of this kind. The large number of sulphurous spring lakes which came to light during archaeological excavations could be of foremost importance in the life of Aquincum. Klára Póczy also recognised that at the beginning of the 3rd century AD several private baths were built, which could be settled only on lukewarm and hot springs, in which Aquincum abounded (PÓCZY 1980/1).

Most scholars hold that the *Kis Island* at Óbuda, – which at the time of the construction of the shipyard (second half of the 1830s) had become a peninsula by the filling up of the Northern part of the Danube branch between itself and the Nagy Island at Óbuda – was a bar islet of the same kind as most of the islands of the Danube between Aquincum and Transaquincum (*Figure 11*). However, its role in the Roman Period became enhanced by the construction of the group of buildings forming the palace of the Governor of the province Pannonia Inferior at the beginning of the 2nd century AD. Bridges, harbour docks, too, were built on the bank of the island. In the direct vicinity of the Governor's palace there were calcareous, sulphurous springs forming lakes of 0.5–1 m depth and with a diameter of 1–3 m. The activity of springs was so intense that a yellowish grey coloured calcareous crust precipitated concentrically on the root-system of trees, by cementing them together (*Picture 17*). SALAMON (1878) and CHOLNOKY (1936) opine that in the Roman Period the Kis Island belonged to the land, to the higher flood



Picture 17. Calcareous crust precipitated concentrically on the roots of trees in the vicinity of karst springs in the Kis Island at Óbuda

plain level situated on the right bank. In addition to the testimony of archaeological finds F. SALAMON based his opinion on the fact that the Danube was tending towards the right bank. This statement can be corroborated by the effect of the Coriolis-force mentioned above. However, the shift of the position of the Danube beds must not be attributed to this single cause. The river was wandering already in the Early and Late Holocene, deflecting sometimes to the East and sometimes to the West from its present bed, from the Óceán Ditch at Káposztásmegyer to as far as the Mocsáros at Békásmegyer which once were beds of the Danube.

In the Kis Island during the landscape rehabilitation preceding the construction of the shipyard – still before the filling up – surfaces at an altitude of 99–100 m aB belonged to the lower flood plain level while those at an altitude over 100 m aB formed the higher flood plain level. The floor level data of excavated Roman roads and buildings on the island suggest an altitude of about 102 m aB. The altitude of floor levels characteristic of the Military Town is also about 102–103 m aB. From these figures it is clear that the surface data of the Military Town and its neighbourhood as well as the higher flood plain level data of the Kis Island and Nagy Island are in a good agreement.

Between 1835 and 1837 beds at both sides of the Kis Island were dredged out and also the shipyard basin together with the channel leading into it, were established at that time. In 1836, in the course of dredging of the channel between the Kis and Nagy islands the dredging boat Vidra encountered Roman walls. Roman walls were found also between the bank at Óbuda and the Kis Island. Based on their position a question was raised namely whether in the Roman Period the Kis Island had really been an island or a part of the land which the military town was built on. The Roman Period wall remains surveyed by G. Zsigmondy were situated at a 120 fathoms' distance to the North and at a 37 fathoms' distance to the South from the present bridge leading from the Óbuda bank towards the Kis Island (SALAMON 1878). Comparing this very important information with the profiles of North–South direction (*Profile No 21*) and East–West direction (*Profile No 22*) set on the Kis Island we may discover a thought-provoking connection as regards the development of the Kis Island.

On *Profile No 21* we find filled up beds of streams on the Kis Island. On *Profile No 22* on the bank of the present day Danube Bend West from the Kis Island the layers terminate in a line of a vertical cutting which suggests that the bed was formed artificially. Several data suggest that the territory of the Kis Island – at least prior to the Roman Period and at its very beginning – could be part of the land.

Arriving from the Solymári Valley the ancient Aranyhegyi Stream had built a large alluvial fan in the mountain foreland. Incised here and there into its own alluvial cone it changed the direction of its flow frequently. Traces of this process can be observed in the material filling both in the Mocsáros and in the lower-lying areas South of it as well as at the mouth of the stream. It seems that before the building of the Governor's palace the stream shifting southwards from its alluvial cone and then flowing along a longer section parallel to the Danube, flowed across the Kis Island and emptied into the Danube branch between the Kis and Nagy islands near the Southern tip of the Óbudai Island (*Figure 14*).

The area crossed by the stream belongs to the higher flood plain level, several types of freshwater limestone can be found in it. On *Profile No. 21* below the infilling of anthropogeneous origin beds of one-time streams filled up with fine-grained sediments are seen on the original undulating surface. Such beds of North-West to South-East direction are shown on *Figure 14*, representing conditions prior to the beginning of the activity of Romans aimed at the transformation of the environment in the Kis Island. Beds indicate fluctuation in the direction of the flow of the ancient Aranyhegyi Stream as well as the changing position of its mouth. Abandoned beds were filled up with silty sediments. The last natural direction of flow of the stream could be identical with that of present-day branch of the Danube which was situated between the present-day Kis Island and the military settlement.

Based on borehole profiles and on geomorphological maps, this bed, considering its width and depth, could not be a natural branch of the Danube. The branch of the Danube which used to be the western border of the Kis Island was an artificial channel dug by the Romans which in modern times was thoroughly widened and deepened. To widen this reach of the

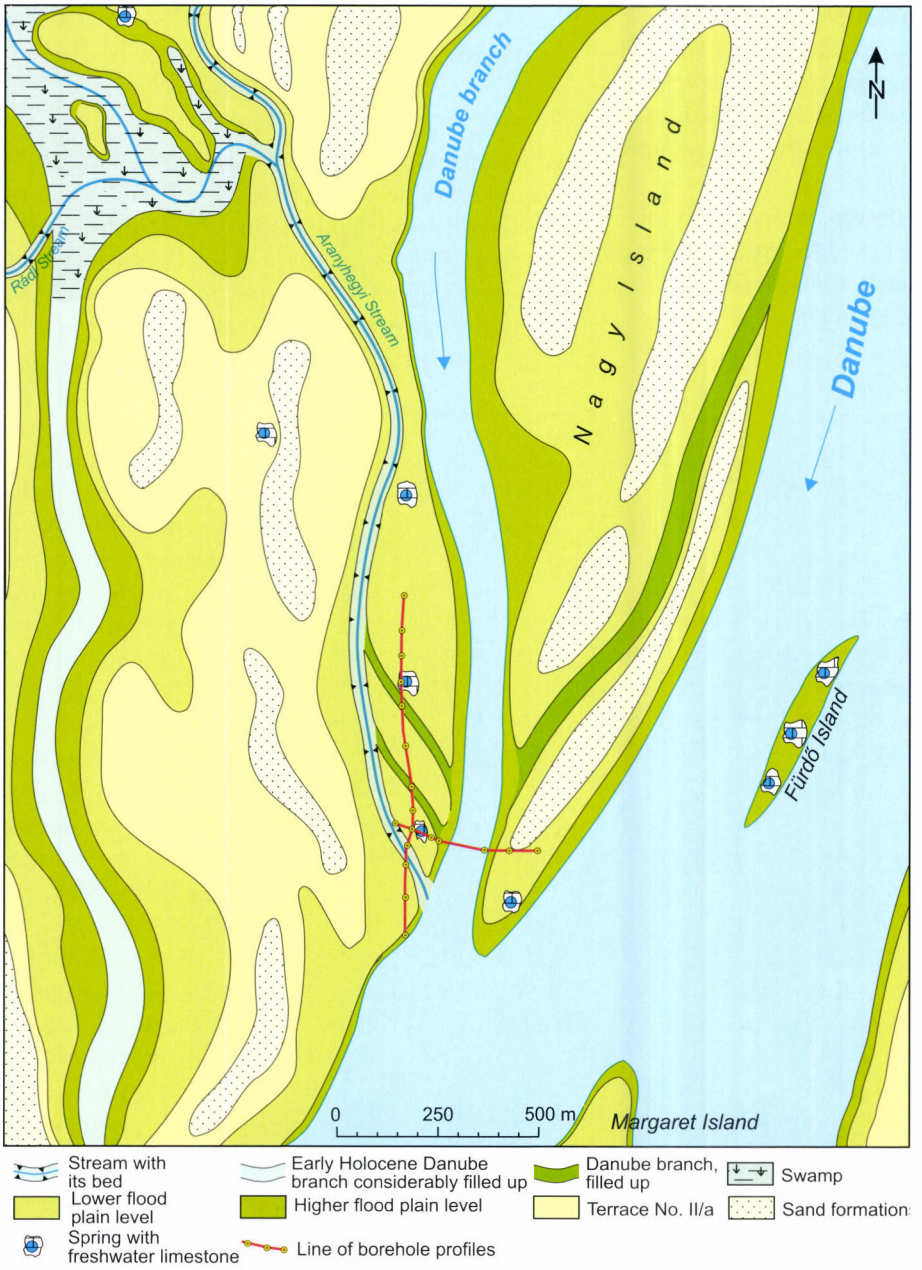


Fig. 14. Reconstructed geomorphological map of the Óbudai Island (Ferenc Schweitzer, 2010)

ancient Aranyhegyi Stream and to connect it with the bed of the Danube first of all the establishment of a leading trench was necessary between the bed of the stream and the Danube. Water of the Danube was let into this ditch from the North, deepened and widened by the heavy current of the river (*Figure 15*).

Supposedly this work was useful also from the viewpoint of sewage treatment. The draining off of the increased quantity of sewage became possible only by gravitation. Therefore a rudimentary antecedent of the channel had to be established – the widened bed of the Aranyhegyi stream – at present known as the right bank Danube branch of the Kis Island. With the establishment of the channel and with its Southward extension sewage water could be drained directly into the main branch of the Danube. The construction of the first part of the Governor's palace in the Kis Island was initiated by Hadrianus, the first governor of Pannonia Inferior (between 106 and 108), the later emperor, on the higher flood plain terrain. This is the earliest possible date of the beginning of works for completing the channel.

At a low water stage there were found posts on the eastern bank of the Kis Island, on the present-day Hajógyári Cove. They were by all means the remains of the Roman Period embankment. On the basis of dendrochronological investigations its construction was continuous during the 2nd century AD (LÁNG – GRYNAEUS 2005).

On the Western side of the Kis Island – South of the present-day small bridge – other posts were observed, though the majority of them followed the line of the 19th century bank. (see chapter 5.4.). While it has been no opportunity to study them so far, on the basis of their position it cannot be exlcuded that some of them originate from the Roman Period. If it is correct these posts could be part of the Eastern embankment of the hypothetical artificial bed.

At present the above mentioned channel serves as a branch of the Danube, while in the natural Danube bed a dam was erected between the Kis and Nagy islands in the 19th century, when the two were attached and the Hajógyári Cove was formed.

Since the water regulation measures in the Roman Period the Aranyhegyi Stream has been flowing into the Danube at the North of the Kis Island up to now (*Figure 15*).

3.6. Environmental conditions and environmental management in the Roman Period

As it was mentioned above the erosional-accumulational alluvial fan which existed in the area before the Roman Period is the result of the landform development which took place in the Pleistocene and Holocene. Since the end of the Pleistocene onward the Danube has formed its environment already in the Pesti Plain. The river built and eroded its alluvial fan depending on the current quantity of its water and on climatic effects. Partly due to subsidence along the margin of the mountains its main channel had been shifting gradually Westward. After deepening of its late Pleistocene valley it accumulated gravelly sediment sequences upon the mountain foreland thus forming an alluvial fan.

Based on the analyses of data yielded by borings it can be stated that at the beginning the Danube eroded the surface features constituted by older clayey-marly rocks. As a result a slightly undulating lowland surface was formed.

Over this surface the river first had deposited sediments with coarse gravel and later sand of grain-size turning gradually finer, and also alluvial silt and silty sand assemblages. In the 1st through 3rd centuries AD the surface was composed of these sediments (*Figure 1, Profiles 1–22*).

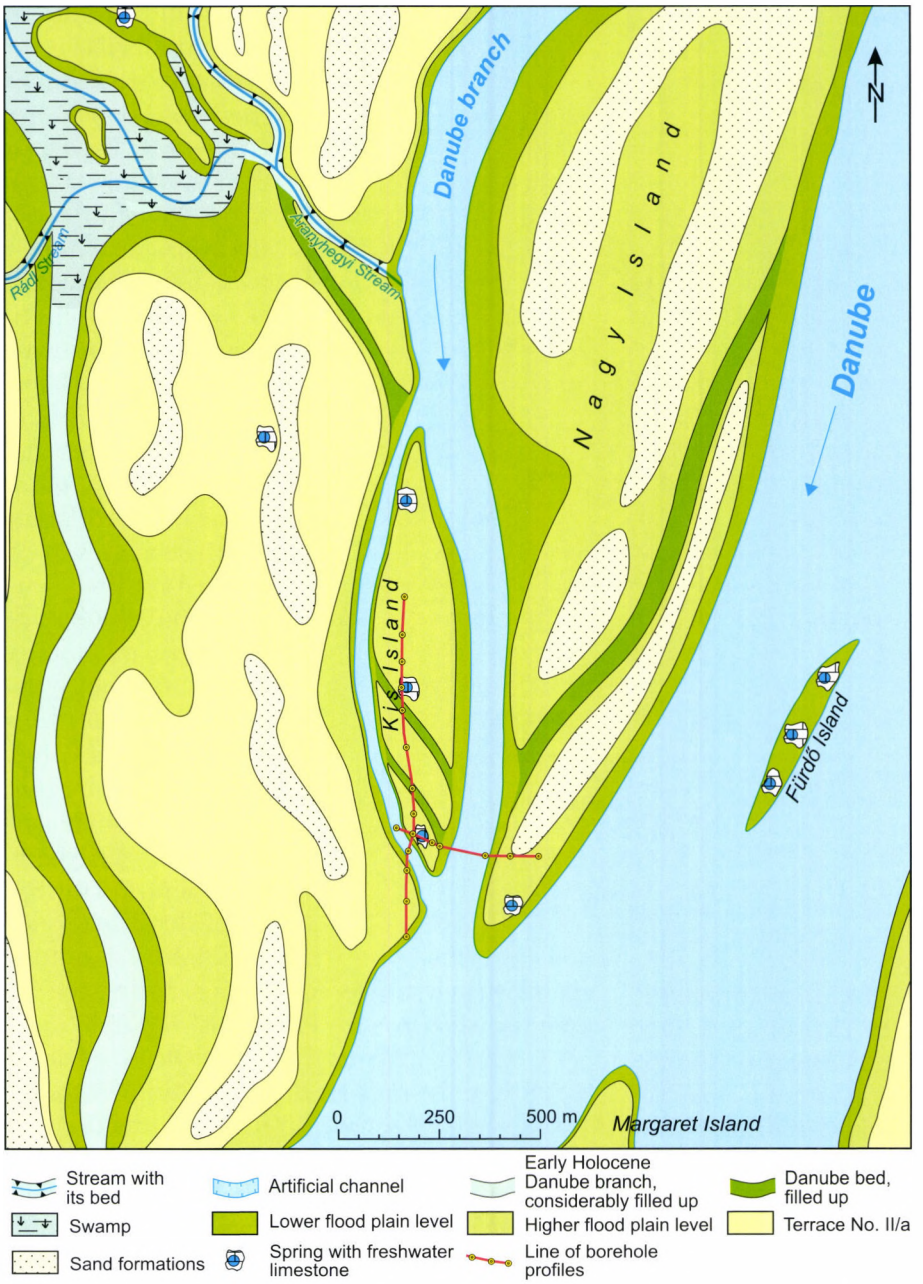


Fig. 15. Reconstructed geomorphological map of the Óbudai Island after the construction of the artificial channel (Ferenc Schweitzer, 2010)

The Danube had built up its terraced surface by lateral erosion, branching into numerous spillstreams (GÓCZÁN 1958). A map of the area composed on the basis of the more recent detailed analyses and of borehole data (*Figure 16*) represents the main types of relief and landforms which determined the environment of settlements within a wider paleogeographic frame. In this map the most important Roman Period remains of Aquincum and its wider surroundings are represented by using archaeological results.

The area divided by the Danube into two parts can be characterised from a morphological point of view by different erosional and accumulational forms, flood plain terrace levels and surfaces.

The higher terraces building up the mountain margin together with the slopes of alluvial cones, are dissected by smaller or larger stream valleys. The No II/a flood-free terrace which formed 26,000–33,000 years ago according to 14C datings includes surfaces at an altitude of 102.5–104 m aB. Higher flood plain surfaces (terrace No I) were formed at an altitude of about 101–102.5 m aB. These two terrains were the primary scenes of Roman Period settlements, including the Military Town and the legionary fortress.

Abandoned beds being in different stages of filling up and the lower flood plain level (at 99–100 m aB) belong to the lower terrains. These regions are endangered by floods or have a high ground water table, even though some remains of constructions from the Roman Period (e.g. piers of bridges, road banks) can be found here as well. During the geodetic survey of buildings, floor levels, when their altitude data were analyzed, it became clear that those terrains which were suitable for construction, generally started at an altitude of 100.32 m aB. Those features which are situated at the lowest altitude, that is at about 98.94 m aB, such as e.g. constructions of posts, bridgeheads, excess water conduits were built on the rim of one-time beds, remains of beds. Based on the data of road levels the floor level of the legionary fortress was at an altitude of 103 m aB, while that of the Civil Town was at about 103–105 m aB. On the Kis Island the floor levels of the Governor's palace were at an altitude of about 101.07–103.14 m aB.

Summarizing the above mentioned outline it can be stated that the environment of Roman Period Aquincum was, in many respect, different from the present-day landscape. While the main geomorphological forms, the mountains, the valleys dissecting them, the alluvial fans of streams arriving at the plain, the filled up Danube meanders, river channels and stream beds existed in a state quite similar to the present-day circumstances, natural processes of the past nearly 2000 years and human activity forming the environment in different ages resulted in significant changes. Furthermore, it must be remembered that both the climate and the regime of the rivers in the Roman Period differed from the present-day ones to some extent.

In the Roman Period the Danube shaped the direction of its flow, filled up its beds and built new channels in a natural way. River regulation was carried out at that time, too, but it was only of limited, local importance. The Danube in the neighbourhood of Aquincum was divided into several branches, with a series of islands in its bed. On the left bank the river encircled flood free island terraces and the usually uninundated higher flood plain surfaces. These higher-lying segments provided suitable places of settlement for Transaquincum opposite to Aquincum and for Contra Aquincum lying to the South of the former.

On the right bank there were larger continuous surfaces suitable for settlement, as by the Roman Period the Danube had practically left the area. No II terrace surfaces free from floods occupying large spaces and the higher flood plain levels flanking the river bank were the most suitable places from the viewpoint of human settlement. The surface of the higher flood plain level (terrace No I) and that of the terrace No II/a, were dissected also by the remains of one-time Danube beds. The area of the Mocsáros, representing a one-time Danube bed, too, was already in a largely filled up state already in the Roman Period. In the case of very high water stages the Danube could flow in this former bed. The swampy region of the Mocsáros with its high ground water table was unfavourable for human settlement. The Civil Town situated mostly on higher flood plain and No II/a terrace levels, was surrounded by waterlogged places which could be strategically favourable from the viewpoint of defence. However, the expansion of the town and an increased demand for exploitable lands urged already the Romans to fill them up. They could get new spaces by the regulation of streams (e.g. Szépvölgyi Stream, Aranyhegyi Stream) and by making use of their natural ability to deposit load (ZSIDI 2007, 61).

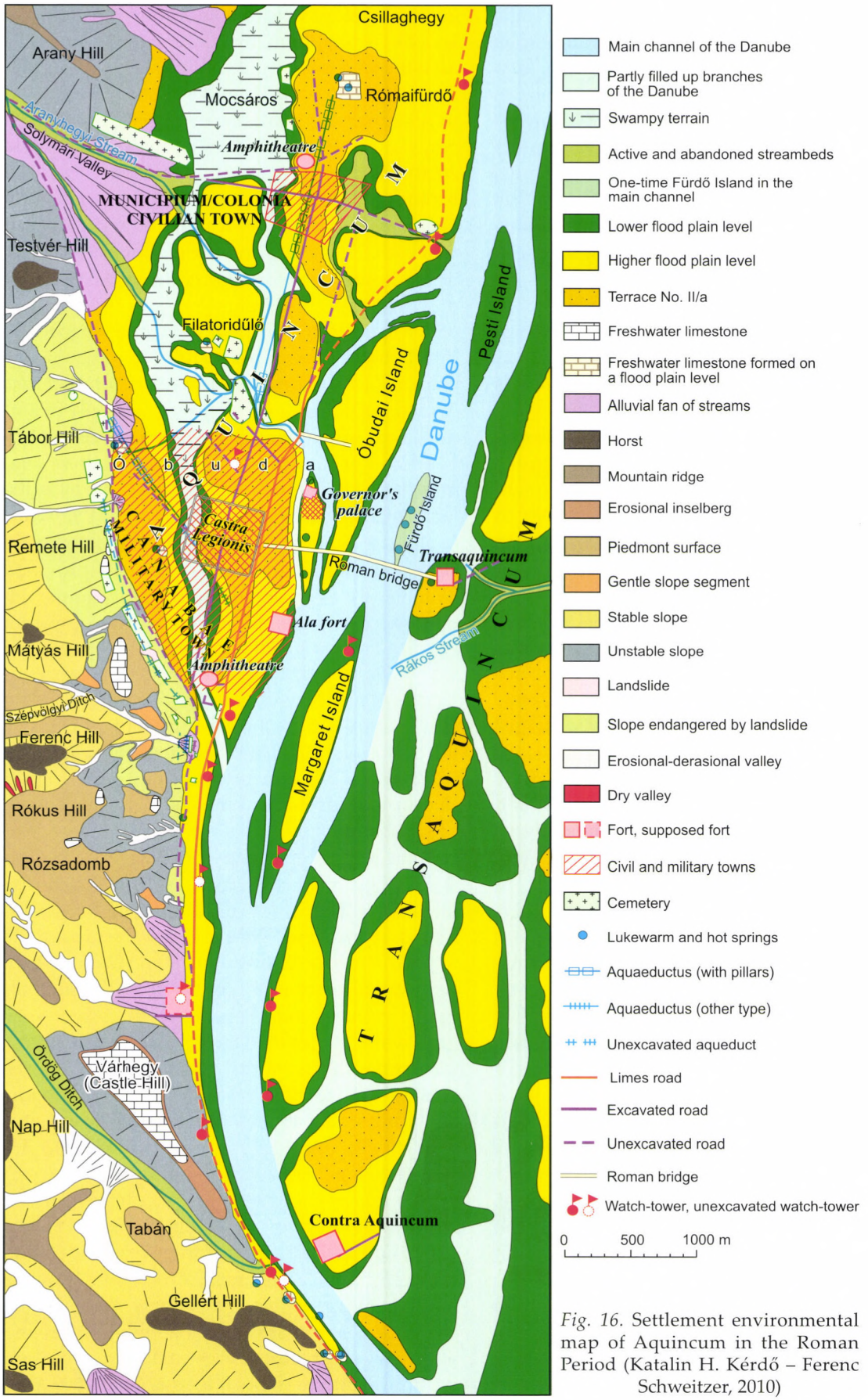


Fig. 16. Settlement environmental map of Aquincum in the Roman Period (Katalin H. Kérdő – Ferenc Schweitzer, 2010)

Another remarkable example of the regulation of water-courses and of environmental transformation is the forming of the Kis Island at Óbuda where also the group of buildings of the Governor's palace was built. On the basis of geomorphological and geological data it is supposed that the branch of river on the right side of the island is actually an artificial channel.

The Military Town was situated in a flood free area South of the Mocsáros. It is also discernible in the geomorphological map (*Figure 16*) that the terrace No II was divided into two parts by a somewhat lower-lying stripe of North to South direction. This water-course or channel which divides the terrace surface No II marks a former Danube bed which, however, was filled up considerably by the Roman Period.

The Danube both as a transport route and a natural defence for the strategically important centre of the province had a fundamental role in the development of Aquincum. Besides the river, streams arriving from the mountains were also of great importance in the water supply of the town and of the fort. The presence of numerous springs of different temperature and abounding in water were also relevant factors for settlement. Several remains refer to the existence of contemporary bathing. An engineering masterpiece, a monumental aqueduct, transported the water of the springs of the Rómaifürdő thus having a great role in the water supply of Aquincum.

It is conspicuous that another important garrison of a legion along the Danube in Pannonia Inferior, that is Brigetio (Komárom-Szőny), had geographic conditions so similar to those of Aquincum (VICZIÁN – HORVÁTH 2006). Both settlements were situated at the boundary between mountains and plains, along a river, had cold and hot karst springs abounding in water and both of them were surrounded by swampy territories providing defence for the settlements. At both places the remains of engineering masterpieces of Roman Period water regulation and environmental transformation can be found.

4. Aquincum and its surroundings in the Roman Period

4.1. Natural characteristics, geographic toponyms

Due to its favourable environmental situation, certain parts of Aquincum and its hinterland – namely the Danube, divided into several branches, the islands in it, the flood plains along the river, the higher terraced surfaces and mid-mountain-type landscape, the stream valleys which dissect the mountains, as well as the cold and warm springs abounding in water – certain parts were already inhabited before the Roman era (T. NAGY 1973, 41)[7]. Some of the connections between environment and topography had already been recognized in earlier research as well (T. NAGY 1971/1, 68–70). A short summary was also published on the geological conditions of the region (BÓKAI – KISS – MÓCSY 1995). By now, as the result of excavations carried out over the last few decades as well as pedological and geomorphological investigations[8] initiated in the recent past and becoming ever more widespread, increasingly accurate amounts of data have become available. We will present this data in this volume *(Figure 17)*. Since the natural characteristics of the environment surrounding Aquincum were already reviewed in earlier chapters, here only certain of their essential elements will be emphasized.

In addition to its strategic position, one of the chief characteristics that made Aquincum town, a favourable place for settlement was, as elsewhere, the proximity of water. The reconstructed hydrographic map of the hypothesized position of the Danube riverbed in the Roman Period *(Figure 10)* is a good illustration of the way the area impacted by the river was considerably larger than nowadays as the river flowed along several branches. Streams coming from the mountains partly filled up the bed and flood-plain of the Danube with deposits. The lowlands, marshy areas, areas experiencing intermittent inundations and ones free from inundation alternated with each other. There were numerous springs close to Aquincum, some of them on the terrace plains of the Danube while other flowed by the boundary between the hills and the lowland areas. Even now there exist several active springs whose waters were already used in the Roman period (among them, the springs exploited by the modern Római and Csillaghegy open baths)[9].

As for geographic names used in the Roman Period in Aquincum, only the name of the Danube River (*Danuvius*) is known (MÓCSY 1962, 522–523). A stone altar, erected by *Titus Aterius Callinicus*, a freedman of the Governor and found on the Hajógyári Island in Óbuda, was dedicated to the flowing Danube (*Danuvio defluenti*) (*Picture 18*)[10].

Picture 18. Altar stone dedicated to the Danube rolling along, from the Hajógyári Island

[7] NAGY T. 1973. Hidrológiai és régészeti térkép (Hydrological and archaeological map). Compiled by Tibor Nagy and Ernő Nagy.

[8] MINDSZENTI – HORVÁTH 2003.

[9] LORBERER 1998.

[10] CIL III 3416 = 10379, TiAq 46. On the role of the Danube River in the Roman Period ZSIDI 2007.

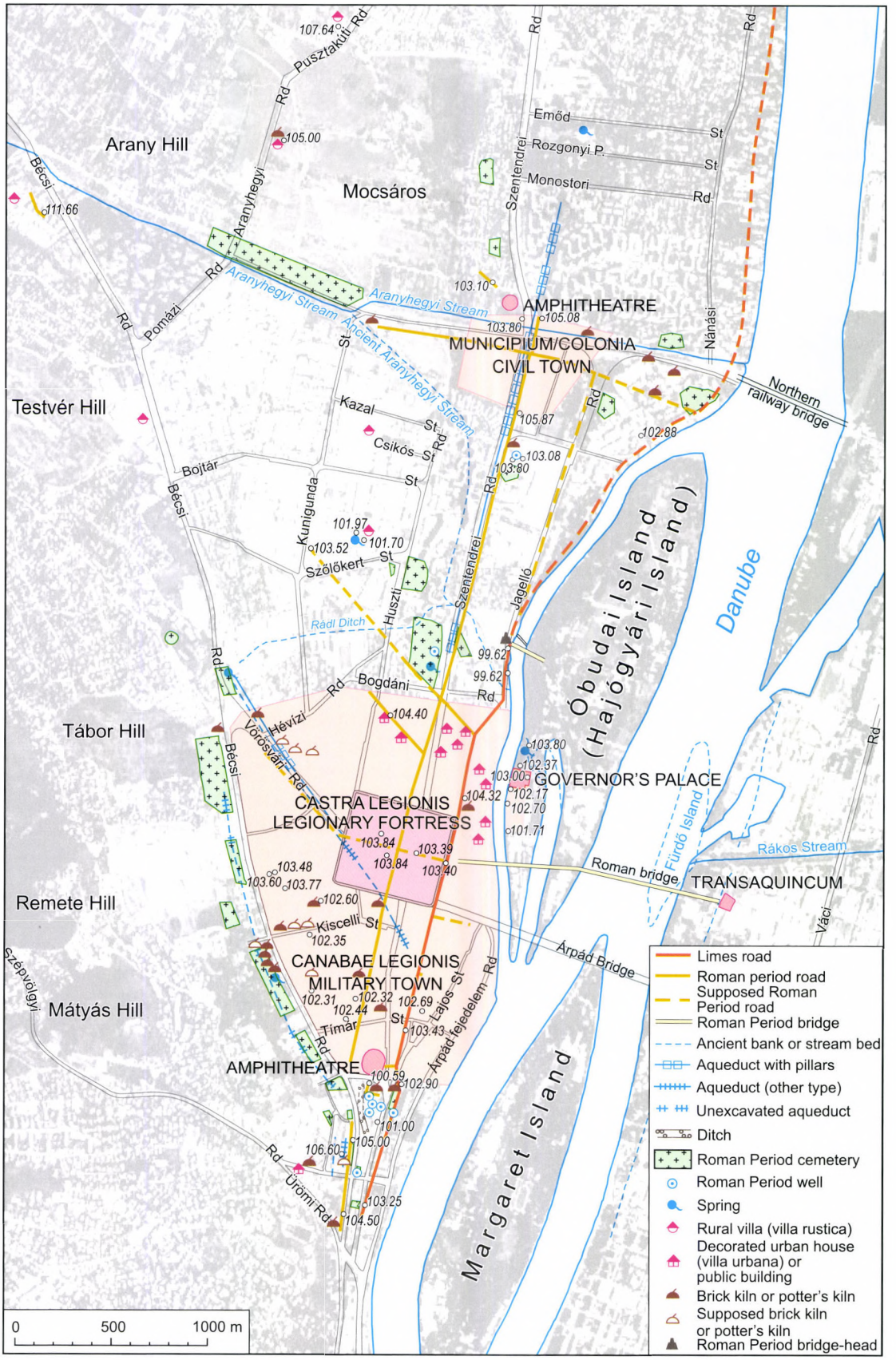


Fig. 17. The settlement structure of Aquincum in the 2nd–3rd centuries AD with the indication of present network of streets (Katalin H. Kérdő – Anikó Kovács – Mrs. A. Vándor)

At present, it is not possible to identify the Roman names of other rivers, streams, springs or mountains in the area.[11] While a survival of some geographic place names can be documented (TÓTH 1976/2, 125) in the early and intensively Romanized, South-Western parts of Pannonia, there does not seem to have been a survival of other names of this kind in the neighbourhood of Aquincum.

4.2. The place and role of the town in the history of Pannonia province

4.2.1. The Roman occupation and the Julius-Claudian dynasty

Aquincum was occupied during the reign of Emperor Claudius (AD 41–54). The conquerors established their first encampment on the banks of the Danube at the end points of those diagonal roads crossing the province from the South-West.[12] An earlier hypothesis, according to which an *ala fort* had already been constructed in this area during the reign of Emperor Tiberius, at the time Drusus was commissioned in Illyricum, had already been disproved by earlier research.[13] The study of grave steles found along the North–South running military road following the bank of the Danube make it possible to localize the fort somewhere in the area between Castle Hill in Buda and the Danube River itself.[14] The names of the troops occupying the encampment are known inscriptions from on tombs. The first garrison troop was the *ala Hispanorum I* which was stationed here between ca. AD 50 and 69. From the 70s till the end of the 80s of the 1st century AD it was succeeded by the *ala I Hispanorum Auriana*.[15]

Opinions differ regarding the immediate reasons for the establishment of the Víziváros fort. Although the Sarmatian–Iazygians appeared on the Great Hungarian Plain in the first half of the 1st century AD, it is generally not thought to be their appearance which caused the fort to be constructed. Scholars think that the occupation of strategic points along the Pannonian section of the Danube was more likely to have been part of a coherent plan initiated after *Illyricum* was divided into two parts and an independent *Pannonia province* established along with other provinces lying along the Danube (*Raetia, Noricum and Moesia*).[16] At any rate, the occupation was part of a longer process during which Rome extended her influence over the Carpathian Basin, using both military and diplomatic means, as well as taking successful advantage of the conflicts between the peoples inhabiting in the region. The politics of Rome in the newly organized provinces was characterized by the following practice: troops stationed within a province were increasingly placed there more to secure peace with neighbouring populations living beyond the borders of the empire than to control the inhabitants of the occupied province. As for both Aquincum and later *Pannonia* too, the decisive element in its location was the actual situation of foreign affairs in this frontier zone. At the time of the Roman occupation, the population dwelling in the fortified settlement (*oppidum*) of the *Eraviscan* tribe was forced to re-settle some of the inhabitants to areas close to the new forts.

4.2.2. The Flavians and Traianus

Further development of the *limes* system took place within the framework of the large-scale construction programme of Emperor Vespasianus (AD 69–79) when the line of the *limes* along the Danube was reinforced by new auxiliary troops.[17] One of the high priority elements in this programme was the construction of a new fort for a cavalry unit lying about six kms North of the Víziváros fort in Óbuda. A fragmentary building inscription from the fort discovered during excavations was dated to the

[11] Recently, on the basis of a remark in the *Notitia Dignitatum* (*Not. Dign. Occ. XXXIII. 55*) it has been suggested that the Roman Period name of the Gellért Hill may have been *mons Teutani*: MRÁV 1992–1995, 15. However, the logical argument is not supported by the results of topographic studies.

[12] GABLER 1971, 1977, 1979, 1999, TÓTH 1976/1, 1977, 1981. The road ran toward Aquincum from *Savaria*. (TÓTH 2006, 63–65).

[13] SZILÁGYI 1938, 287. etc., TÓTH – VÉKONY 1970/1.

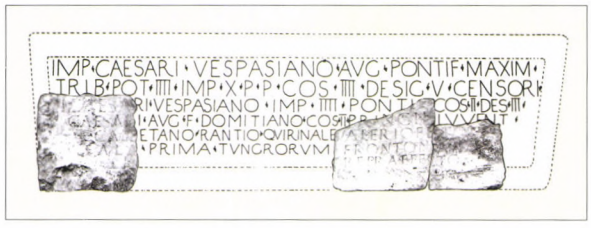
[14] RADNÓTI 1955, NAGY T. 1971/2, 1973, KÉRDŐ 1997/1, 2003/2, 2005.

[15] TÓTH – VÉKONY 1970/1, FITZ 1961–62, NAGY T. 1971/2.

[16] TÓTH 1976/1, 1981, FITZ 1993–1995, 23–28, 1999, 27–30.

[17] TÓTH – VÉKONY 1970/2, GABLER 1997, 1999, LŐRINCZ 2001, 2005.

rule of Emperor Tiberius (AD 14–37), (SZILÁGYI 1938) although this date was later revised by Endre Tóth and Gábor Vékony. Their new date, this time the correct one, was AD 73 (TÓTH – VÉKONY 1970/1). When more fragments of the building inscription came to light, even the name of the cavalry unit which built the fort, the *ala I Tungrorum Frontoniana*, became known (KÉRDŐ – NÉMETH 1986) (*Picture 19*).



Picture 19. Building inscription from AD 73 of the fort of a cavalry troop stationed at Aquincum

From the eighties, during the wars in the Danubian lands with the increasingly strong Sarmatian–Iazygians and Dacians the *limes* system as it stood then proved insufficient. The destruction that ensued made it necessary to further reinforce the frontier. This event marked the first time that a legion was ordered to Aquincum.

The *II adiutrix* was stationed in Aquincum from AD 89 onwards. Researchers have proffered various opinions regarding the stay of the *legio IIII Flavia* between AD 89 and 92.[18] Thus, it was suggested the first garrison troop stationed here was the *legio IIII Flavia* with the *legio II adiutrix* being stationed in Aquincum only from AD 92 (ALFÖLDY 1959, 139–141, FITZ 1986). The situation becomes all the more complicated because only limited information exists on the topograpy of the Víziváros. Not only is the precise place of the early *auxiliary* fort unknown but it is not possible to definitely state whether a legion had been stationed there at all in this early period, if only with *vexillatio*.

The early legionary fortress at Óbuda, the precise place of which is unknown as well, was – because of the wars being fought the Danube – was temporarily fortified from the North by an *auxiliary* fort in AD 106. However, after the division of the province into two parts and together with the Governor's headquarters moving there, this fort was abandoned (SZIRMAI 1990, 684 etc., NÉMETH 1991, 92, 98). At any rate, clarifying the topography of the earliest forts is primarily possible only with the results of new excavations providing further information on the history of the troops in the early period (NÉMETH 1991–1992, 1993).

After the end of the Danubian wars, the Emperor Traianus (AD 97–117) who as the Governor of Pannonia played a decisive role in the success of these wars, restored peace for some time in the Danube region by occupying Dacia which he organized into a province.

4.2.3. The division of Pannonia into two parts. Aquincum as the capital of the province with a single legion

The re-organization of the public administration of the province was based on experiences gained during the wars of the previous two decades. By the division of the long Danubian frontier line, the Northern Danube section which belonged to *Pannonia Superior*, faced the frontline of the Germanic tribes, the Markomanni-Quads. The duty of the Eastern section falling to *Pannonia Inferior*, was to repulse the attacks of the *Sarmatian–Iazygians*. The existence of this organizational concept is also demonstrated by the fact that the division was mainly based on foreign affairs and military politics, and not necessarily internal ethnic boundaries (FITZ 1993–1995, 371 etc).[19] The *legio II Adiutrix* took part in the Dacian wars and then returned to Aquincum. From this time the legion stayed on there as a permanent garrison.[20] Aquincum, that far-flung seat of the legion, became the capital of *Pannonia Inferior.* The province with a single legion was governed by governors of *praetorian rank*.[21]

The order to establish the province most probably went out[22] in AD 106. The first governor of the province was that *P. Aelius Hadrianus* who had served here earlier as the *tribunus laticlavius* of the legio II Adiutrix (FITZ 1993–1995, 220 etc. Nr. 104). The Governor's palace was constructed at this time on present-day Hajógyári Island opposite to the representation quarter dealing with the public administration of the

[18] ALFÖLDY 1959, FITZ 1986, 1993–1995, 332 etc., LŐRINCZ 1978. see also STROBEL 1988, 205–208, 215.

[19] TÓTH 1985/1.

[20] On the battle order of the legions ALFÖLDY 1959, LŐRINCZ 1978, FITZ 1986, STROBEL 1988.

[21] An overall study of the complete public administration of the province: FITZ 1993–1995.

[22] FITZ 1993–1995, 371 skk.

province in the North-East part of the *canabae*. The quarter contained the office of the Governor, shrines, public baths and most probably official buildings as well. [23]

The following decades can be considered the first golden age of the province and of Aquincum itself. After the organization of *Dacia provincia* martial encounters with both the Danubian Germanic peoples and the Sarmatian–Iazygians became less frequent. The building up of the Governor's headquarters, the rebuilding work after the wars stimulated the economy and encouraged growth in the population of the *canabae*. The *veterani* of the legion and merchants of western origin both played a prominent part in economic life and in societies they belonged to.

The public administration system of the *canabae*, still not raised to the rank of a town, consisted of the association of the *veterani* and of Roman citizens (*veterani et cives Romani consistentes ad legionem II Adiutricem),* with two *magisters* [24] at its head. Two *decuriones* (members of the town council) from the Military Town *(canabae)* are known from the corporation patterned after the town council (*ordo)* [25;] one of them was called *(A)elius Licinius*[26] who was probably the *decurio* of the *canabae* of Aquincum, while the other was *Foviacius Verus iu(nior,*[27] a member of both the *ordo of the municipium and of the canabae* [28]

The *vicus* was situated about 2 km from the legionary fortress, in what was later to be the Civil Town before the settlement was promoted to the rank of *municipium*. The *vicus* already contained organizations, instituted by citizens who had come there from elsewhere such as the association called *cives Agrippinenses Transalpini,* that is, a society of citizens from present-day Cologne, consisting mostly of merchants.[29]

The settlement preceding the *municipium* was founded in the Flavian Period as a settlement of craftsmen and merchants. It was considerably built up during the reign of Traianus (AD 97–117).[30] The *municipium* was supposedly founded during the reign of Emperor Hadrianus (AD 117–138) and in his presence. The year AD 124, supposed so far to be the time this event took place, however, it is impossible because in that year the emperor was not in Pannonia (HALFMANN 1986, 190 etc., 195, 199–201).

After the settlement was promoted to the rank of *municipium,* the council of the newly founded town, consisting of the mayors *(duumviri)* and members of the council (*decuriones*) comprised mostly those members of the aristocracy of the *Eraviscan* tribe who had been granted roman citizenship – as the personal names show.[31] This practice changed only in the second half of the 2nd century AD. As far as we know at present, local inhabitants no longer played a decisive role in the town council from this time onwards.[32]

The legal status of the *civitas Eraviscorum* after the foundation of the *municipium* has been the object of long-lasting debate among scholars.[33] Civitas Eraviscorum already had officials of its own earlier and this independent organization survived till the end of the 3rd century AD, remaining connected to the town organization, the *ordo*, the whole time. There are inscriptions corroborating this connection, some of which were already known earlier and complemented by a group of altars which found in Bölcske walled into a Late Roman military feature.[34] This group of altars, dedicated to *Iuppiter Optimus Maximus Teutanus,* were erected by the mayors of the *municipium,* who each year on the 11th of June honoured the god by erecting these votive

[23] On the area KUZSINSZKY 1897, PÓCZY 1986 and recently NÉMETH 2005/1, on the Governor's palace KÉRDŐ 1999/1, 2002, 2008.

[24] CIL III 3505, BudRég 12 (1937) 135, No 55 = AnÉp 19812, 803. ALFÖLDI 1940, 204. Recently: KOVÁCS 2000/2 with earlier literature.

[25] BudRég 12 (1937) 135, No.55 = AnÉp 1982, 803.

[26] ALFÖLDI 1940, 209, 230, No 11., AnÉp 1944, 93; MÓCSY 1951, 117–119; AnÉp 1953, 9.

[27] *dec(urio) kan(abarum) dec(urio) m(unicipii) Aq(uinci) II vir q(uin)q(uennalis) flaminicus* PÓCZY 1972, 22 = AnÉp 1972, 363.

[28] The only reference to the greatly debated *territorium legionis* comes from the 3rd century AD: CIL III 10489. For a summary of the problem: KOVÁCS 2001/1.

[29] NAGY, L. 1931, 1932; PÓCZY 1961.

[30] NAGY, T. 1971/1.

[31] CIL III 3347, ArchÉrt 78 (1951) 107 = AnÉp 1953, 14. see also footnote 26, *d(ecurio) m(unicipii) A(quinci)* CIL III 14341, 6; BpRég 12 (1937) 122.

[32] *q(uin)q(uennalis) sacerdotalis,* CIL III 3488, and from the same family: AnÉp 1973, 363, AM Inv. No.87. 3. 1. (unpublished) as well as the leader of the last *ordo of the municipium,* members of families known from several inscriptions dating to the *Severan* Period: CIL III 10398. For a complete enumeration of officials in Aquincum see KOVÁCS 2008, 38–40.

[33] MÓCSY 1951, 1959, 1970. otherwise: FITZ 1971, 1993–1995, recently: KOVÁCS 1999/2.

[34] SOPRONI 1990, 1993/1. The monograph on altar stones: BÖLCSKE 2003.

altars for the welfare of the *civitas Eraviscorum* to *Iuppiter* and, at the same time, to *Teutates*, the supreme god of the Eraviscan tribe, whom they recognized in the person of Iuppiter. The altars were most probably placed in the main shrine of the deity. On the basis of an altar stone found in Rezeda Street, researchers localized this shrine in the area of the abandoned celtic *oppidum* on Gellért Hill.[35] There are several different hypotheses about the nature of the feast day in the context of similar dedications[36] found at *Carnuntum* (today Bad Deutsch-Altenburg–Petronell, Austria), the chief town of *Pannonia Superior* and erected at the same time.

Not only trade connections with Italy and the western provinces were important in the economic life but there was also a boom in local industry. Extensive quarters of craftsmen, potters' settlements and brickyards were established at the margin of civil settlements. The municipal rank of the Civil Town went hand-in-hand with city-planning, large-scale public constructions, e. g. the building of *amphitheatres* or the aqueduct between present-day Római open-baths and the legionary fortress as well as its *canabae*. The latter one was a joint project of the town and the army (PÓCZY 1972, 1980/1–2). After the legionary fortress was rebuilt in stone, the *canabae*, too developed an urban character, not to mention the completion of the representative quarters that were the headquarters of the Governor (PÓCZY 1994, MADARASSY 1999/1, NÉMETH 2005/1).

Economic prosperity ended with the Markomannic wars between AD 167 and 180 which resulted in by far the most severe destruction in the life of the province. Marcus Aurelius himself stayed in the war arena in Pannonia for years, till his death in AD 180. His son, Commodus, ended the war and aimed at control over the *limes* by establishing a chain of signal towers. (see chapter 4. 8). However, he was most probably unable to finish this work because of his premature death (SOPRONI 1993/2, 1996).

The legionary fortress in Aquincum suffered less destruction in the war than the Civil Town, yet at the turn of the century large-scale construction works were carried out there. This can be explained by the favoured position held by Pannonia province and the Pannonian army after Septimius Severus acceded to the throne because it was the Pannonian army who had supported him in his bid to become emperor. Both capitals, Carnuntum and Aquincum, were promoted to the rank of *colonia* in AD 194. This promotion in rank extended not only to the earlier *municipium* but also to the *canabae*.

Most probably the construction work was finished by AD 202 when the emperor and his escort, returning from the Parthian war, marched across Pannonia. They were met with celebrations in Aquincum (FITZ 1959), where *L. Baebius Caecilianus*, the governor, welcomed the emperor and the returning *legio II Adiutrix*.[37]

During the reign of the Severan dynasty, and especially at its beginning, there was a long period of peace and prosperity. Certain parts of the legionary fortress e.g the *principia*, the great bath and the house of the *tribunus lacticlavius*, with the newly painted *mithraeum* within it, were rebuilt in lavish style. Almost every public building was restored and decorated with stucco, wall-paintings and mosaic floors.[38] This prosperity was actually based on the financial support which the Pannonian army received as a token of the emperor's gratitude in the form of pay and other favours. And long-lasting peace made possible real economic development.[39]

By the Severan Period, the ethnic composition of the inhabitants became more diversified. Based on the inscriptions, inhabitants of Eastern and African origin appeared in the town in addition to people who had moved there from the Western provinces. These newcomers came to the town through the army and partly through trade contacts as well. Due to their economic importance they became even members of the *ordo*, where the presence of inhabitants of local origin can no longer be demonstrated. It is symptomatic that about two-thirds of inscriptions connected to them consist of *votive* and building inscriptions and a considerable part of

[35] SOPRONI 1990, On the basis of a cult statue dedicated to *IOM Teutano* found there Póczy Klára (PÓCZY 1999) connected the group of buildings identified as the Governor's villa on Szépvölgyi Road with this shrine. NÉMETH 2003, 57, 11. fn. and Tóth in: BÖLCSKE 2003, pp.391–401, see also the following note.

[36] PISO 1991, 2003. The studies of E. Tóth, I. Tóth, Zs. Mráv and M. Nagy. In: BÖLCSKE 2003. See also for this KOVÁCS 2004 (review).

[37] NÉMETH 1976/3 = AnÉp 1976, 544; FITZ 1993–1995, 541 sk. Nr. 325.

[38] MADARASSY 1991/1–2, KOCSIS 1989, 1990, 1991, ZSIDI 2002/1, 2002/4, 46–52; KOVÁCS 1993/3.

[39] MÓCSY 1974/1, 236–240, 243–247; 1974/3, 45–71.

these come from the Civil Town. This patterning has more to do with the more intensive investigation of public buildings there, since in Óbuda research was primarily concentrated on military establishments. At the same time, many epitaphs came to light from the cemeteries of the Military Town and perhaps it is not simple chance that these inscriptions on graves speak of *decuriones*, that is, "simple" councillors, with the exception of two graves of *quaestores coloniae* (members of the municipal council in charge of financial matters)[40]. Wealthier mayors most probably buried their dead on their own estates and it seems that these territories have so far fallen outside the main focus of intensive research projects. The estates may also lie outside the territory of Budapest. Some kind of rotation system can be observed between the town leaders comprised of the councillors and military people, the *veterani* of the *legio II adiutrix*: contacts were created through marriage. Either the son of a *veteranus* became a member of the town council or conversely, the son of a *decurio* joined the army. [41] It is not possible to trace actual contacts of this kind among the well-to-do members of higher rank within the *ordo*. Naturally, however, those persons who took charge of public tasks and made investments for public purposes, the *praefecti of collegia or patroni*, emerged from this group of wealthier members of higher rank in the municipal council.[42]

4.2.4. The capital of the province with two legions, the readjustment of boundaries in 214

In AD 214, the emperor Caracalla modified the boundaries between the two provinces. Earlier scholars connected this with the visit of the emperor but lately this idea has been refuted (KOVÁCS 2007, 150–169). As a consequence of this order the importance of the provinces from a military point of view changed. *Pannonia Inferior* became the more important province because Brigetio, together with the *legio I adiutrix* and the auxiliary troops stationed in that section of frontier, were annexed to it. The altered provincial borders also meant delegation of control over the Quadic frontier to Lower Pannonia. From that time on, the province with its two *legion*s, was directed by governors of *consularis* rank rather than *praetorian* ones. (FITZ 1978, FITZ 1993–1995, 971 etc.).

As a consequence of the promotion in rank, the residence of the Governor was rebuilt. This reconstruction concerned not only the building complex comprising the Governor's palace in the island but also the official quarters in the Military Town opposite the palace (PÓCZY 1986, 1994). Based on the inscriptions and of the latest results from excavations, it can be said that the sector of Óbuda mentioned above was the place of the buildings of the Governor's office which, together with the palace on the island. All these structures were erected according to a coherent concept. On the basis of the epigraphic record known so far, the two territories were used together till the introduction of the military reforms of Gallienus.[43]

In the thirties of the 3rd century AD the peaceful development came to an end. Fights with the Quads, Sarmatians and Roxolonai flared up again in the Danube Valley. Soldier emperors succeeded each other at a rapid clip. One of them was Decius and we know of a tablet with an inscription on it from the period of his rule, erected in honour of Herennius Etruscus, the son of the emperor himself.[44]

In spite of the concentration of troops in Illyricum, in AD 260 Pannonia suffered the most severe war-time damages in its history. During the battles, even the legionary fortress at Aquincum was severely damaged and the reconstruction works lasted nearly a decade (*thermae maiores, porta praetoria, porta principalis dextra and principia).*[45] The Governor's palace on the Óbudai Island was abandonned.[46]

The military and public administration reforms of Emperor Gallienus (AD 253–268) allowed military classes originating from the Danube lands to attain the highest positions after the emperor withdrew military management, including the governing of the provinces,

[40] CIL III 10536: BudRég 21 (1964) 235; CIL III 10523 = 3589 = 3684, 10535, 10521.

[41] KUZSINSZKY 1934, 67, 382; BudRég 21 (1964) 235; CIL III 10521, 10536.

[42] CIL III 3456, 10461–10464, AntTan 5 (1958) 73–74, CIL III 3438, 3488, 10439, 10440, 10447, 10475, BudRég 12 (1937) 101–102, No.28, 135–145, No. 55.

[43] NÉMETH 2005/1, 123–126.

[44] FACSÁDY 2003.

[45] PÓCZY 1990.

[46] KÉRDŐ 2008 together with earlier bibliography and chapter 5.4.2 of this volume.

from the senators and delegated it to officers belonging to the Equestrian order. After the loss of Dacia in AD 271, Pannonia was directly exposed to attacks of groups of peoples arriving from the East. Only a significant concentration of troops in the Danubian provinces could provide peace for the Western provinces and Italy.[47]

4.2.5. The capital of Valeria – centre of military public administration

According to the public administration reforms established by Diocletianus, Pannonia was now divided into four parts. Aquincum became the capital of *Valeria* province, which was created from part of former Lower Pannonia in AD 296. The town became the residence of the commanding officer of the province (*dux*) as well. Research carried out so far has not identified beyond doubt the centre for civil public administration (FITZ 1993–1995, 1180 etc.). Moreover, to date, none of the *praeses* of *Valeria* province is known to us.

Repeated wars with Danubian Germanic tribes and Sarmatians encouraged rulers to build military forts in Sarmatian territory as well. The interpretation of the text mentioning this strategy has, however, been heavily debated. The text is a note of Hydatius concerning the year AD 294 on the construction of forts in Aquincum and Bononia – *His conss castra facta in Sarmatia contra Acinco et Bononia. Some* scholars identify one of these forts with the bridge-head fortification at present-day Erzsébet Bridge (FITZ 1979, 354, T. NAGY 1973, 122) and based on this idea the fort was called *Contra Aquincum*. [48] Excavations and rescue excavations carried out in the proximity to the fort at various times made clear that an earlier, large fort had already been established on this territory. It was supposedly built in the second half – end of the 2nd century AD. The later, diamond-shaped building – on the basis of its fan-shaped corner-towers and the horseshoe-shaped towers – was built in the 4th century AD. [49]

Instead of the so far generally accepted *Contraacinco* name of the fort (based on Not. Dign. occ. XXXIII 65) Zsolt Mráv has taken into consideration the supposed name for Gellért Hill and suggested another name for this fort, that is *castellum contra (montem) Teutani or castellum contra Teutanum* (MRÁV 1992–1995, 15: 2003). He instead connects the name *Contra Aquincum* with that Late Roman fort which was established opposite the legionary fortress at the mouth of the Rákos Stream, while the name generally used for it so far, that is, *Transaquincum,* he would use for a large zone on the left bank of the Danube below Aquincum. Péter Kovács (KOVÁCS 2001/2, 150 SKK, 2004) does not accept his arguments.

In the last decades of the 3rd century AD and in the first decades of the 4th century AD several major campaigns were led against the Sarmatians. The permanent danger from Sarmatian attack even made necessary frequent visits by the emperors in Pannonia at their residence in Sirmium (Sremska Mitrovica, Serbia). The last known votive inscription was found in the area of the former Military Town and comes from AD 307. It was offered up by *Iulius Valerianus and Aurelius Maximus, duumviri* of the *colonia* Aquincum for the well-being of the members of the Imperial House.[50] In AD 315, after he had conquered Licinius in a battle near Cibalae (Vinkovci, Croatia), Pannonia was brought under the control of Constantinus.

During the rule of Emperor Constantinus I (the Great) wars with the Sarmatians made necessary construction of a Late Roman fort added on to the Eastern wall of the legionary fortress as well as rebuilding work that also conformed

[47] FITZ 1993–1995, 977–989, MÓCSY 1977.

[48] Mócsy hypothesized that these forts were built, not along the frontier, but deep in the "land of the Barbarians", outside the frontiers of the empire (MÓCSY 1974/1, 269). Others think that there is an erroneous form of the Southern Pannonian place name *Acumincum* near *Sirmium* (present-day Sremska Mitrovica) in the text and explained the necessity of the fortification of the Syrmian *limes* section by the fact that *Sirmium* became the imperial residence (SOPRONI 1977, 1978, 113, TÓTH 1980).

[49] Zsolt Visy dates the fort to the time of Constantinus at the earliest, (VISY 2000, 58), but Endre Tóth (TÓTH 1985/2, 124 SKK) has demonstrated an even later date for this construction. Péter Kovács puts this period to the middle of the 4th century AD. According to him, the earlier fort could have been constructed any time within a rather long period between the rules of *Caracalla* and *Constantius II* (KOVÁCS 2001/2, 150 SK). Thus, he does not exclude its identification with the fort mentioned by *Hydatius*. Moreover, demonstrating a year's delay in *Hydatius,* he suggests that *Contra Aquincum* was even built in the presence of the emperor. To correctly answer this question will require partly further authenticating excavation data and partly a more detailed publication of the results of the excavations carried out so far.

[50] CIL III 3522 + 10384 = ILS 658.

to the re-organized system of public administration and the establishment of a new topographic system (PÓCZY 1976/1, PÓCZY – NÉMETH – SZIRMAI – KOCSIS 1986). For the time being only partial information and excavation data exists about these constructions so that even their function could not be determined in each. At the same time, it can be said in any case, the transformation of the largest building in the earlier legionary fortress, that is, the *thermae maiores*, into a Late Roman palace served the purposes of public administration. Thus, this building can be regarded as the palace of the commanding officer of the province.[51] This status is all the more likely as the Governor's palace on the Óbudai Island had already been abandoned earlier. At the same time, the territory on the bank of the Danube within the Military Town opposite to the island could continue to be used in accordance with its function in earlier public administration even up to the erection of the new Late Roman fort. After this time, the Late Roman fort built on the bank of the Danube in the 4th century AD included this territory. The new fort was most probably occupied by the *legio* and by the inhabitants moved in from the abandoned parts of the *canabae*. These changes signal that there was a difference now in the function of this part of the earlier *canabae* that had occurred at the time of the establishment of the Late Roman fort at the latest. This new quarter for public administration was situated in the secure territory behind the Late Roman fort, within the protected central part of the earlier legionary fortress along the *via praetoria* where this function is testified not only by the remains of public buildings built over the former bath but also over the pulled-down walls of former barracks.[52]

The Sarmatian wars also continued under the successors of Constantinus. Because of these wars, even Emperor Constantinus II was forced to visit Aquincum.

The last major attempt to defend the empire was made in AD 364 during the rule of Emperor *Valentinianus* who was of Pannonian origin. The stamped bricks with the name of *Frigeridus* dux testify to the large-scale fortification works on the *limes* in Aquincum, too. Within the fort, further constructions were certainly erected during the rule of Valentinianus as well.[53] The shrinking of the ground covered by the fort, the reduction of its space, may have taken place after the death of Valentinianus, just as at other *limes* forts, though opinions differ on the probable date of this process.[54] In Aquincum, it can be demonstrated that the Southern part of the fort remained in used longer. Burials placed in the Northern part of this structure show that it already unoccupied and abandoned.

Goths, Huns, Alans had invaded the Pannonian region first in AD 377. They had already received the status of *foederati* (groups of peoples allied with Rome) in AD 379 allowing them to settle in the province. It was at this point that the inhabitants of Pannonia began to leave. Those who remained here found shelter from the frequent raids and looting within the walls of the fort. In AD 433, when the former province was also officially delivered up to the Hun leader, Attila Roman rule in Pannonia formally came to an end.

4.3. The Civil Town and its environs

4.3.1. The territory of the Civil Town and the history of constructions there. An outline

The territory of the Civil Town of Aquincum

Primarily owing to its central position within the Carpathian Basin, Aquincum played an important, quite often decisive, strategic, political and economic role throughout the Roman Period (L. NAGY 1942, 379–382., SZILÁGYI 1968, 74–76., T. NAGY 1973, 84).

The town is situated on the alluvial lowlands of the Danube, an area cut by river and stream beds as well as low-lying marshy parts. The settlement was established on a higher flood plain level on terrace II/a and on surfaces where the height was increased by wind-blown sand (*Figure 16*). As a higher area it was free of floods.[55] The most favourable terrains for settlement were

[51] Melinda Kaba (KABA 1991) does not take a stand on the function of the later building.

[52] NÉMETH 2005/1, 2005/2, 2005/3, 2006/1.

[53] PÓCZY 1976/1, NÉMETH 1994/1.

[54] SOPRONI 1978, 1986.

[55] The map representing the earlier hydrological reconstruction was made after H. Horusitzy and was published by Tibor Nagy in his work, to date is the most detailed work on the geographic conditions existing in the Civil Town (NAGY, T. 1971/. 68, Abb. 5). For a detailed description of the subject see the first chapters in this volume.

on the terrace islands oriented North to South, encircled by river beds. Some of these beds were still active while other ones were in different stages of filling up. Upper flood plain levels were also favourable places for settlement. Roads, too, led traditionally on these surfaces. Owing to favourable natural conditions an East–West direction crossing place, too, was formed there. Lower-lying swampy areas of large extension did not provide conditions suitable for settlement either in periods preceding the Roman rule.

The Danube flows hardly 200 m from the presently excavated area of the Civil Town. In prehistoric times and in the Roman Period, the area impacted by the Danube was more extensive than nowadays since the area was dissected by a network of river and stream beds. A variegated environment formed consisting of alluvial fans of streams, wind blown sand formations, river and stream beds in different stages of being filled up and marshy areas in the low-lying land by the Danube in the foreground of the mountains. From the viewpoint of the Civil Town, the most important waterway was the Aranyhegyi Stream, called also the Solymári Stream that flowed in a South-Eastern direction into the Danube. The Aranyhegyi Stream is clearly visible on the 1837 map of Vasquez, shown crossing the above-mentioned area. The Rádl Ditch flows into it from the West. Another, smaller stream is represented in the line of the present, artificial bed of the Aranyhegyi Stream. The Rádl Ditch springs from a marshy area (*"Palude Stumpf"*). At Krempl Mill the direction of its flow at a right-angle changed to travel further East into the Danube *(Picture 20)*.

Earlier results of hydrological and climate studies suggested that there was a relatively dry climate in the Roman Period, remaining the same during the migration period.[56] Tibor Nagy based his hypothesis on these studies when he suggested that the area in the Northern neighbourhood of the Civil Town was called Mocsáros (marshy) only later (a Roman Period villa estate was recently excavated here). According to Nagy the area became a marshland only following the Migration Period (T. NAGY 1971/1, 70, 31. fn.). That is, these lower-lying regions became swamps as a result of the wetter climate which set-in in the Medieval Period as the result of rises in the water levels of the Danube together with a rise in the ground water-table.

Recent research, however, corroborate this hypothesis only in part because by now it seems obvious that hydrological conditions were already impacting the topography of these low-lying regions in the Roman Period. The region had a marshy character in the Roman Period as well, at most the extent of lower-lying wet land areas may have been somewhat smaller. According to observations made so far, the buildings of the villa estates in the vicinity of Aquincum were in every case built on terrains rising above the low-lying ones (Kaszás dűlő – Csikós Street villa or the Mocsárosdűlő villa). At the same time, a timber structure recently came to light North of the Civil Town amphitheatre a most probably was a road bed. Roads with structures like this were built usually in low-lying, waterlogged regions (LÁNG 2002/1).

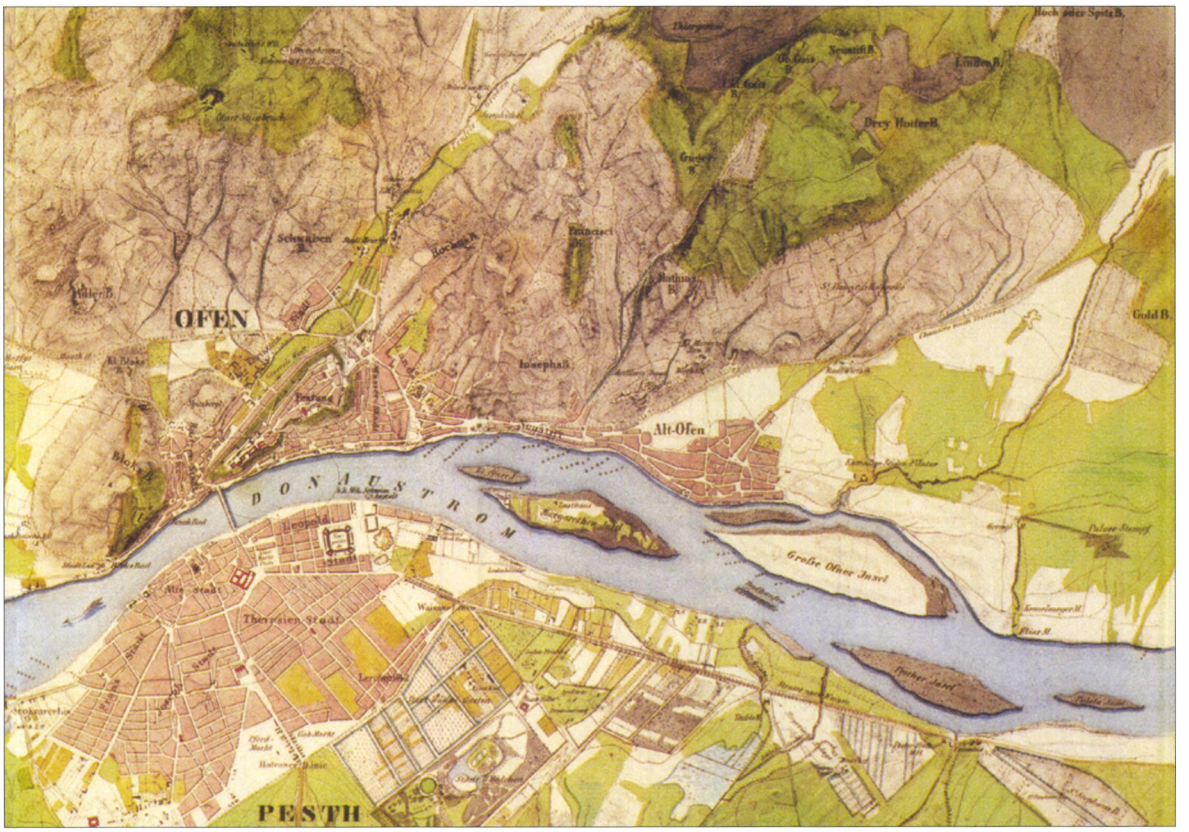
Spring activity was intensive in the Buda Hills and along the rivers.[57] The group of springs most important for the Civil Town was situated North of the town. These springs are active even today and supply water for the basins of the Római Strandfürdő. Their water derives from Triassic and Eocene layers. These springs were harnessed and lifted for the first time into channels of over-ground aqueducts by the Romans. For the time being, it is not known positively whether before the Roman Period the water spouting into the baths actually flowed East, directly into the Danube or whether it flowed South into the Danube, more-or-less, along the present, artificial channel of the Aranyhegyi Stream (see above). It is very probable that the spring cluster at Csillaghegy and the springs providing water to the Pünkösdfürdő open-bath (Békásmegyer) were already active in the Roman Period. In addition, some phenomena suggesting the presence of former, no longer active springs were brought to light in excavations carried out South of the Civil Town, by the Filatorigát and in the villa zone, in the territory of the so-called Szőlőkert Street villa.

An outline of the history of construction in the Civil Town

The Civil Town of Aquincum was situated about 2 km North of the legionary fortress (KUZSINSZKY 1934, L. NAGY 1942, T. NAGY 1973). For the time being, still based on indirect proof, it is hypoth-

[56] Compare with the summary of O. Láng and F. Schweitzer on the scientific and archaeological problems of Aquincum in chapter 3.1 in this volume.

[57] LORBERER 1998.



Picture 20. Detail of the map by Carlo Pino Vasquez from 1837 (BTM Kiscelli Museum, Collection of maps)

esized that its antecedent was founded at the earliest during the rule of *Vespasianus*. This settlement was formerly identified as a *vicus* (T. NAGY 1971/1), however, on the basis of the results of recent research made on its defensive works, it became clear that at the beginning the settlement was a military (*auxiliaris*) fort and the vicus represented only a later phase in its development. Around AD 124, Hadrianus raised it to the rank of *municipium (Municipium Aelium Aquincum)* and in AD 194 Septimius Severus raised it again to the rank of *colonia*, most probably together with the Military Town *(Colonia Aelia Septimia Aquincum).* The last mention of the municipality is from AD 307. The latest burials connected to the settlement date to the very end of the 4th century AD, and supposedly also from the very beginning of the 5th century AD.

The irregular, trapezoid-shaped territory of the Civil Town (*Figure 18)* was encircled by a wall which was part of the defensive system. The track of the wall is known in the North, West and South (ZSIDI 1990/2).[58] It is possible to measure the Western section of the town wall (381 m). The town wall in the Western quarter of the town was reinforced by two corner towers with circular ground plans and diameters of 8 m, as well as by some intermediary set-back towers with a quadratic ground plan of 3 x 4 m, located every 60 meters on average. The town wall had been pulled-down but its foundation was found to be here and there 200–220 cm wide. On the basis of certain sections which were preserved in the segments adjoining the towers and which preserve the marks of several alterations it can be estimated that the width of the vertical walls was ca. 110–150 cm. At this moment, it is not clear whether the vaults of the North–South running aqueduct, which divided the town into two parts, were walled-in for defensive purposes or not. The town wall was interrupted by gateways at the points the main roads emerged from the town. A gateway was later cut out from both Northern and Western sections of the wall as well as another gateway defended by small gate-towers. The ditch running along the town wall has also been found on three sides of the town. Based on what is known today, at one time the town was encircled by a single ditch, however,

[58] For recent summaries on the Civil Town: ZSIDI 2002/4, 2006, 2008. On recent research on buildings LÁNG 2008.

later different sections of it were renovated differently, changing its position relative to the town. Excavations within the town wall revealed traces of an inner embankment constructed from clay bricks in several places.

The aqueduct was built over vaults and ran along the Western side of the North–South main road of the Civil Town (PÓCZY 1995). The aqueduct got its water from a cluster of springs North of the town and it transported water across the Civil Town towards the legionary fortress. It forked off in several places within the town. Rainwater and sewage water were carried by an extensive network of channels, with a combined length of a kilometre.

The limitation of the network of streets was already complete during the reign of Traianus (AD 97–117). The most important buildings in the centre of the town were also erected at that time (PÓCZY 1995, 470). During the the *Severan* Period it is likely that the street plan was rearranged. The streets were narrowed and formerly large *insulae* were divided into lots (ZSIDI 2002/1).

The *forum (Figure 8.* 2.) was situated where the *cardo* and *decumanus* (streets "C" and "D") met. At its centre lay a large quadratic courtyard containing a *podium-temple* (*Figure 18.* 2a) that opened from it. The *basilica (Figure 18.* 1) stood close by to the East while to its South was the large public bath (*Figure 18.* 4). The row of shops along the Western side of the *cardo* (street "C") (*tabernae, Figure 18.* 3) were associated with buildings in the centre of the town. The back wall of the row of shops adjoined the road along the aqueduct *(Picture 21).* There were large public buildings (a shrine, the meat market, headquarters of a collegium (*Figure 18.* 5, 6, 39) standing on the Eastern side of the *cardo* t while the neighbouring areas were occupied by large private homes.

The remains of six public baths and one private bath have been excavated so far in the Civil Town. The bathes were arranged in a chess-board pattern suggesting rational town-planning. The majority of the baths had a simple linear ground plan although there is also a so-called double bath with a symmetric ground plan as well.

Besides the so-called large shrine in the forum there was also a shrine to *Fortuna Augusta* (*Figure 18.* 5) as well as one dedicated to *Diana and Silvanus.* The ground plans of two of the four Mithras shrines in the Civil Town are known. One was erected by *Marcus Antonius Victorinus* (*Figure 18.* 23, *Picture 22)* while the other was erected by *Symphorus and Marcus* (*Figure 18.* 18) to honour the deity. The so-called circular shrine, possibly connected to some fertility cult, was built on the Eastern edge of the town. A 4th century AD Early Christian basilica was also connected to this part of the town.

The Northern amphitheatre of Aquincum was built outside the Northern town wall. Gladiator barracks s were added to its Western side. Outside the Southern town wall, near the gate, there was an inn with a bath wing (*deversorium)* (*Figure 18.* 40–41). The 3 main industrial quarters of the Civil Town situated outside town in its Western, later its Eastern and finally its Southern neighbourhood, operated in various, more-or-less succeeding, periods. Excavation has revealed the cemeteries of the Civil Town lining the roads emerging West, South and East from the town on the Danube bank.

Picture 21. Traces of several repeated raising in level by the entrance front of the row of shops (*tabernae*) along the street of the Civil Town running in N–S direction (within the Archaeological Park in Aquincum)

Picture 22. The remains of the mithraeum of Marcus Antonius Victorinus at the Civil Town (within the Archaeological Park in Aquincum). The Eastward inclination of the terrain was favourably used for the cave-like design of the shrine

Fig. 18. The ground-plan of the Civil Town of Aquincum (after Paula Zsidi). – 1 = Low court (basilica); 2 = Forum; 2a = Podium temple; 3 = Row of shops (tabernae); 4 = Large public bath; 5 = Shrine of the goddess Fortuna Augusta; 6 = Meat market (macellum); 7 = House of an artisan in the craftsmen's quarter; 8 = Public building with the altar of the goddess Epona; 9 = House of the dyer; 10 = Dwelling house with an L-shaped corridor; 11 = Public building(?) in the craftsmen's quarter; 12 = Large house with double entrance; 13 = Double bath; 14 = Large dwelling house; 14a = Bath wing; 15 = House with peristylium; 16 = Dwelling house; 17 = Strip house with lateral corridor; 18 = The Mithras sanctuary of Symphorus (mithraeum); 19 = Strip house; 20 = Dwelling house with lateral corridor; 21 = Building with the Dirce mosaic; 22 = The house of Victorinus; 23 = The mithraeum of M. A. Victorinus; 24 = The so-called house of the merchant; 25 = The so-called house of the butcher; 26 = Building at the eastern side of the basilica; 27 = Strip house with pillared portico; 28 = Strip house with lateral corridor and apse; 29 = The house of „Pompeius"; 30 = Dwelling house; 31 = Public bath; 32 = Strip house with axial corridor; 33–35 = Strip houses; 36 = The so-called house of the painter; 37 = Simple dwelling house with apse; 38 = Dwelling house; 39 = Headquarters of the college of firemen; 40 = Bath at the inn; 41 = Inn (deversorium); 42 = Public building to the West of the aqueduct, in line with the large public bath; 43 = Public building to the West of the aqueduct, in line with the meat market; 44 = Public bath in the western quarter of the town; 53 = Building with wall-paintings in the eastern part of the town. A1, B, C, D, D1, E, F, G, H = Streets (Numbers refer to the names of the buildings used in the literature. Missing serial numbers refer to buildings falling outside of the represented area.)

4.3.2. Land use in the environs of the Civil Town

The Danube bank East of the Civil Town

Several test excavations were carried out between 1996 and 2002 East of the Civil Town where features from the former Gas Factory at Óbuda were situated (ZSIDI 1997/3, 1998/2, 1999/1, 2001/1, 2003). Earlier research yielded the remains of an industrial quarter with potters' workshops, a Mithras-shrine, a watch-tower, a cemetery and of an Early Christian funerary chapel in the excavation area.

In the "Gas Factory Period" in the area (1910–1990) numerous structures made of concrete with deep foundations were built in the territory. They covered more than half the excavation area meaning that historical strata were destroyed over a large area. Recent excavations have contributed many new, earlier unknown data concerning the building-over and use of the territory East of the Civil Town (*Figure 19*).

Prehistoric cremation burials represent the earliest inhabitants of the area. These graves were already quite often disturbed by Roman layers. The remains of a construction, a Roman river bank fortification line was found during excavation the part of the territory situated closest to the present-day bank of the Danube. Prehistoric finds came to light here only in the form of scattered potsherds without features. There was an open space West of the coastal fortification which can be traced along a 80 m long section and beyond that ditches were found lying parallel to each other and oriented in exactly the same way as the coastal fortification. A road built on an embankment followed the line of the ditches running parallel to the coastal fortification. Several renewed phases of this road came to light. A paved floor level (?) cut by groups of 2nd century AD cremation burials, altogether about 10 graves, adjoined an earlier phase of the road in the direction of the Civil Town. Although some of the graves in the North-East part of the excavated area had earlier been plundered, a rather rich assemblage of grave goods was still found in the graves, primarily ceramic and glass vessels, oil lamps and, in a slightly lower quantities, objects connected to dress. There is one distinguished

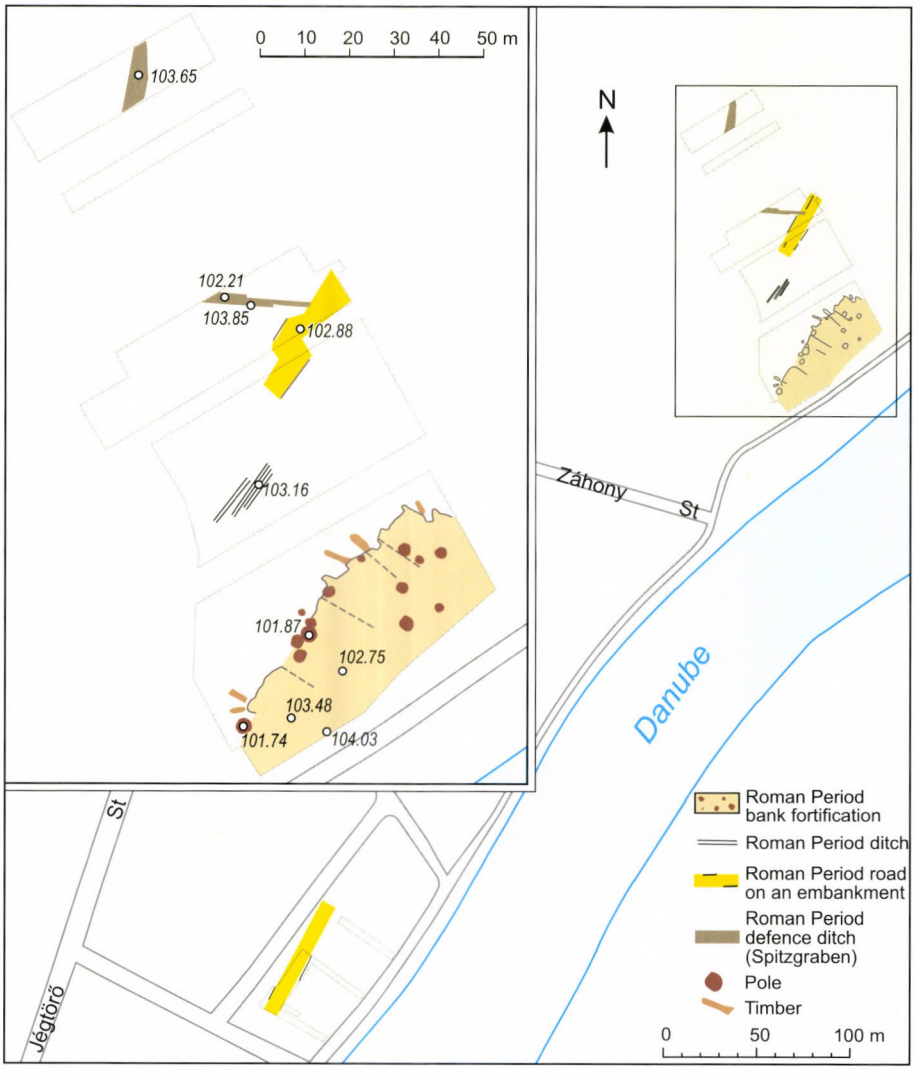


Fig. 19. The use of the territory East of the Civil Town, on the Danube bank (area of the former Gas Factory) (Paula Zsidi – Anikó Kovács – Mrs. A. Vándor)

find among the grave goods, a bronze medical box which was found in an intact condition. These graves represent the earliest burial horizon *(Picture 23)* East of the Civil Town.

Finds came to light during excavation work on a period preceding the cremation burials and the paved floor level. A ditch with a characteristic V-shaped cross-section *(Spitzgraben) running in a North-East–South-West direction* was found along a ca. 30 m long section. The end of the ditch in the North-Eastern part of the area was rounded. South of the ditch but running parallel to it, there was a shallower ditch. The connection of the two ditches is uncertain similarly to several, large subterranean features with a relative chronology identical to that of the ditches. Only very few and mostly indistinctive finds came to light from these features, since they were elements of some kind of structure. Apart from some mortar remains and indistinctive Roman Period ceramics, the ditches themselves did not contain finds. Based on relative chronology, the construction can be dated to a period preceding building work of the Civil Town. A building with a stone wall erected over the fill of the Northern ditch, most probably belonged to a reconstructed, later phase of the construction. Some rather shallow semi-subterranean features with very modest finds dates to the period succeeding that of the cremation burials. The last phase of the Roman Period in the territory lasted from the second half of the 4th century AD till the beginning of the 5th century AD, when the territory was again home to a cemetery. Some inhumation graves, arranged in groups, were found primarily in the mid and Southern part of the territory. Circa 20 graves were simple burials dug into the earth although, in some cases, traces of a wooden coffin could be observed. Tiled-roof graves constructed with thick mortar were characteristic elements of the grave groups. One of grave is especially worthy of mention. The grave was carefully bricked up using building bricks and the inner wall of the burial chamber was carefully coated with white plaster. The better part of the graves had earlier been disturbed, though even the undisturbed ones did not contain objects other than some lamps or glass vessels. In only one case did the grave contain a pierced-work fitting from a soldier's gear, placed at the feet of the dead.

Picture 23. Medical box from one of the excavated graves in the area of the one-time Gas Factory at Óbuda

The cemetery, which most probably was not established earlier than the 3rd century AD, extended West from the road built on the embankment. It was located at a considerable higher level than areas located East in the direction of the Danube. As a consequence, the former surface had eroded so that only those parts of the features which originally were situated below this level were recovered during excavations. Thus, only the lowest phase connected to the digging of the ditch from the earliest period as well as the places of poles (?) belonging to it, remained. Supposedly, this ditch was connected with one of the ditches found in the Eastern excavation area since its direction was exactly perpendicular to them. The disturbed remains of inhumation burials from the latest period were found in this area where only the bottom of shallow graves of a few cm's depth came to light although otherwise graves in the Eastern area were dug deeply into the ground The rapid erosion in the area, earlier situated higher up on what was then a hill, was exacerbated by the fact that the near-surface layers consisted of wind-blown sand.

The Southern foreground of the Civil Town

The earliest data from the Southern foreground of the Civil Town testify that at time the area was used as a cemetery (L. NAGY 1937, 265). The largest-scale excavation carried out the area was in the area of a potter's workshop by the so-called Schütz restaurant in 1932. Two pottery kilns, a well and remains of stone buildings came to light, and according to the reports, several hundreds of fragments of vessels were found *in situ*. Lajos Nagy connected the end of operations at the potter's workshop with the Markomannic wars, dating it to the last third of the 2nd century AD. (L. NAGY 1942, 630–631). However, this date was revised several times in later research

where the end of the workshop with assaults by the Barbarians in the first half of the 3rd century AD (PÓCZY 1956, 117, BÓNIS 1993, 231).

Between 1942 and 1981, only sporadic rescue excavations were carried out in the territory and in its environs in spite of the fact that in this period the territory had been heavily built over. From 1961 there is new data on East–West running wall remains found in the Southern neighbourhood of the territory in question. The most important finds from this of this period are two altar stones with inscriptions that came to the Aquincum Museum from the territory of the former Házgyár in 1974, but otherwise of unknown provenance within the factory (SZIRMAI 1984/3). Both altar stones were dedicated to Iuppiter. One was dated to the middle of the 2nd century AD and the other to the end of the 80s the 2nd century, in AD 188. The rescue excavations carried out before the modernization works of the Szentendrei Road, started in 1975. These excavations yielded further details of the Roman Period past of this area, especially the part nearer to the Roman road. The potter kiln (NÉMETH 1976/2) was found where Szentendrei Road meets Záhony Street as well as the thoroughly burnt layers found in the same place (ZSIDI 1984) that may belong to the potter's workshop at the Schütz restaurant.

From the nineties of the last century the former Házgyár had ceased its operations and to the South of Záhony Street area the houses lining the Szentendrei Road were pulled down while the new building of the Aquincum Museum was built on the Northern side of Záhony Street. A systematic study of this area became possible between 1998 and 2000, in several areas (ZSIDI 1999/4, 2000/2, 1998/1, 2003/3, 2001/2, 2002/3) in connection with this development, before the beginning of the construction.

From a geomorphological viewpoint, the most interesting event connected to the research work the test trench and clearing excavation in the area to South of Záhony Street, over a contiguous area of about 2,000 m^2. The most significant feature in the area from the viewpoint of its geographic position was the Roman Period main road leading along the route of present Szentendrei Road, situated on a terrace surface that was free from floods within the floodplain of the Danube. The area in question was located by the Eastern margin of this elevation with its surface sloping gradually Eastwards towards the Danube (*Picture 24).*

Picture 24. General picture of the excavation from the North in the area of the former Házgyár at Óbuda. The Eastward inclination of the Roman Period level below the present-day horizontal surface is clearly visible

The edge of the higher surface was found 50–80 m distance from the road, from the point where the gradient became more pronounced. In the area situated near the road, the Roman period layers, at the highest point, began at a depth of 80–100 cm while at a distance of 60 m the same layers were found 2–2.5 m below the surface. In those test pits opened a further 100 m distance from the excavated surface we found only modern fill. Even at a depth of 4 m there were no traces of historical layers, archaeological finds or features. That is why we think that here – along the line of present day Jégtörő Street, further away from the present bank of the Danube – there existed some low-lying feature – a river bed or a ditch. For the periodization of the area use in Roman times see below (ZSIDI 2002/3) (*Figure 20).*

Only some sporadic remains testify to the earliest use of the area in question. The most characteristic feature is a palisade (?) wall that ran in North to South, most probably parallel to the Roman Period road located on the Western part of the excavated area. Traces of its pulled-out structural elements came to light along an

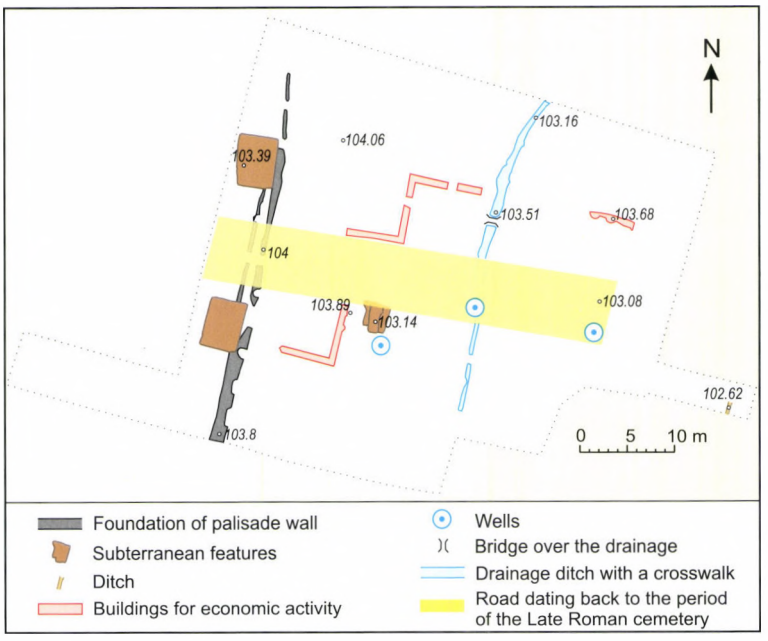


Fig. 20. Building from the Roman Period in the foreground of the Civil Town (territory of the former Házgyár at Óbuda) (Paula Zsidi – Anikó Kovács – Mrs. A. Vándor)

almost 50 m segment *(Picture 25)*. In the middle part of the excavated area, the single timber slot became a double ditch and the space between the ditches appeared, filled up with clay bricks and in some places with stones. Supposedly, the system was renovated on one occasion as suggested by the regularly placed squared-pits of about 5 x 5 m which cut across the earlier ditch system. Traces of a foundation with stone debris in the ground could be observed within these features. During the excavation of the area East of the palisade wall some features were found which, on the basis of their relative chronology and structural characteristics, could be dated to this period. Thus, the remains of several timber structures, the post holes of a pole foundation as well as the remains of a large, clay brick rectangular construction that had been dug deep into the subsoil could be connected to this period. The Easternmost feature from this period (the end of it?) lay around 50 m from the palisade (?) wall in the form of a ditch running parallel to the wall. Within the ditch there was a wider strip with solid silted-up fill. Between the two ditches, the terrain had a gradient of 1 m in an Eastwards direction. Since most probably the features were pulled down and in a later period ditches and pits of the structural elements were filled in, only a very few finds came to light from them. Although the majority of these remains is from the Roman Period there are no characteristic finds within them that would be datable to particular phases. The available data are not sufficient to identify the nature of the feature which the above elements belonged to. However, on the basis of relative chronology, we are convinced that it is these are remains from the phase of in the life of the Civil Town which preceded its *municipium* period.

In the first third of the 2nd century AD a cemetery was established along the Eastern side of the N–S main road running between the Civil Town and the Military Town. The so-called Ladik Street cemetery was established along the Southern section of this road, near the Military Town in the same period. Both contemporary cremation and inhumation burials came to light (ZSIDI 1997/1) in the burial

Picture 25. The dark stripe in the sandy-loessy subsoil is the remain of the timber-slot of the palisade within the area of the former Házgyár at Óbuda

enclosures encircled by walls in this cemetery. The 7 x 7 m stone debris foundation from a large funerary monument was found in the cemetery established along the Northern side of the road, near the Civil Town. The monument had been pulled down to the last few rows of stones of the foundation. Foundations of funeral monuments with similar dimensions and constructed using similar techniques were also observed by Lajos Nagy in the cemetery by the Aranyhegyi Ditch (L. NAGY 1942, 353–385). Altogether seven cremation burials were found South and East of the funerary monument. Some were noteworthy because of the richness of their grave goods. It is certain that inhumation graves were already present in the cemetery in this period. The simple graves dug into the earth around the funerary monument especially come to mind. Sarcophagus burials already appeared in the cemetery in the latest phase of this period. One was disturbed by a refuse pit from a later period. Another sarcophagus was used secondarily in a later period of the burials. The first cemetery established in the area was most probably established in the *municipium* period of the town. On the basis of its chronology it was most probably opened after the cemetery by the Aranyhegyi Ditch ceased operation.

After the early cemetery ceased to function at the end of the 2nd century AD, at the beginning of the 3rd century AD, traces of some economic activity can be found in the area. The systematic elimination of the cemetery is shown by regular evidence that the funerary monuments were pulled down as well as by the contents of a refuse pit which was filled in by stone rubble, supposedly coming from funerary monuments. Remains reflecting the new function of the territory include the rough-and-ready foundations of stone walls at a higher level (remains of outhouses) encircling large, regular premises, the three excavated wells, small arched channels (*Picture 16*) as well as refuse pits containing broken bits of ceramics and bricks. Rows of premises with larger dimensions, wells and refuse pits are clearly connected to the potters's workshop by the Schütz restaurant since at that time the latter adjoined this area to the North. Walls and wells both came to light (BÓNIS 1993, 230) at this potter's workshop. During excavations in 1932, a depot consisting of *imbrices* is mentioned while a similar depot was found in the South-East part of the excavated area. This latter depot consisted of a 4–5 m long row of *tegulae* set edgeways along the Southern side of the rectangular pit. Its presence supports an earlier hypothesis that is brick-making, too, was carried out in the workshop. Operations at the potter's workshop ended at the latest in the middle third of the 3rd century AD which meant another change in the way this area was used (*Picture 26).*

After the middle of the 3rd century until the end of the 4th century AD the area was used again as a cemetery. The majority of the ca. 50 graves from this period are inhumation burials with a few graves dating to the earlier, 3rd century AD, phase of the period while the greater part of the graves come from the 4th century AD. The earlier phase is characterized by secondarily used sarcophagi, graves comprised of stone slabs as well as simple brick graves. A greenish grey coloured friable volcanic rock was used to make uniformly carved slabs for the graves. The stone slabs were bound together by mortar, sometimes just barely and other times very

Picture 26. Well without lining in the Eastern, lower-lying area of the former Házgyár at Óbuda

firmly. These slab graves especially typical for the 4th century AD burials. The latest burials, usually forming groups, were made usually of brick and more rarely from the stone slabs of volcanic rocks described above, using a pink mortar. Quite often even the inside of the graves was coated with this material. It is clear that the makers were aiming at hermetically sealing the graves. From the remaining traces of mortar it can be concluded that there was a roof-form or a vault over the horizontal cover. Although the majority of the graves were found plundered, certain characteristic grave goods survived – especially from the earlier phase. A rich collection of glass vessels, jet jewellery and, in the later phase, coins represent typical goods from these graves. The consistent burial rite and identical grave goods suggest a community of people who were loyal and closely connected to to each other, perhaps for religious grounds.

4.3.3. The area between the Civil and Military Towns of Aquincum

The area lying within the present-day 3rd district in Budapest, in the environs of the Filatorigát and defined by Mozaik Street–the Danube bank–Bogdáni Road–Hévizi Road is situated outside the Northern margin of the Military Town (*Figure 21).* Earlier research has shown the area functioned as a cemetery in the Roman Period. The cemetery came to light during construction work on the Filatorigát (HAMPEL 1891). After this early work, only new excavations connected with modern construction, carried out almost continuously since 1978 and determining the present use of the area, yielded new information about the Roman Period use of the area. The geographic situation of the area is of decisive importance. The ancient Aranyhegyi Stream, coming from the Civil Town, flowed into the Danube at this section of the river. At one time the more-or-less, East–West running course of the Rádl Ditch also flowed into this stream. During excavations, several ditches (water-courses?) filled in during the Roman Period in lower-lying marshy places came to light in addition to the two major streams. Here, the flood-plain of the Danube narrows, thus providing a good ford in the direction of Óbudai Island.

From the viewpoint of the Roman Period use of the area, besides the geographic situation, the North–South running road was of decisive importance. It was located along the line of present Szentendrei Road on the wind-blown formations of a terrace island free from floods (on a "sand-bank"). The aqueduct was of similar importance. It was built later, most probably during the reign of of *Traianus*, on the West side of the road. Different uses and development of the land were observed over the four centuries of the Roman Period in areas West and East of these two features

The area South of the North–South running road and the aqueduct

The remains of the foundation of the stone bridge over the Aranyhegyi Stream (PÓCZY 1984/1, 20) came to light in this area. Along the Eastern side of the North–South road there was a deep ditch with a V-shaped bottom (*Spitzgraben*). However, to date it is not possible to identify its function based on the finds in it. Later graves lining the road were cut into the fill of the ditch. The graves were part of a cemetery that was in use from the turn of the 1st and the 2nd century AD till the first decade of the 3rd century AD. After this area ceased use as a cemetery, the place was occupied again only in the Late Roman Period, and also as a cemetery at that time (ZSIDI 1997/1, BUDAI BALOGH 2007).

South of the cemetery, a destroyed linear construction consisiting of bunches of poles (defensive structure) (ZSIDI 1995/2) we found the eliminated remains of a linear. Only very few finds came to light from the filled back post holes, however, one of the cremation graves from the above-mentioned cemetery cut into the fill provides the *terminus ante quem* for the construction. Based on its direction this defensive structure (it had either a strategic use or perhaps it was part of a flood protection system) led directly towards that bridge excavated on the banks of the Danube and which was erected over the mouth of the Aranyhegyi Stream. On the basis of *dendrochronological* analyses[59] the bridge on wooden poles was built in the last decades of the 1st century AD. The bridge head was rebuilt several times (ZSIDI 1999/2).

The area West of the North–South road and the aqueduct

Excavations were carried out at several points in this area and region between 1996 and 2000 over

[59] LÁNG – GRYNAEUS 2005. 93.

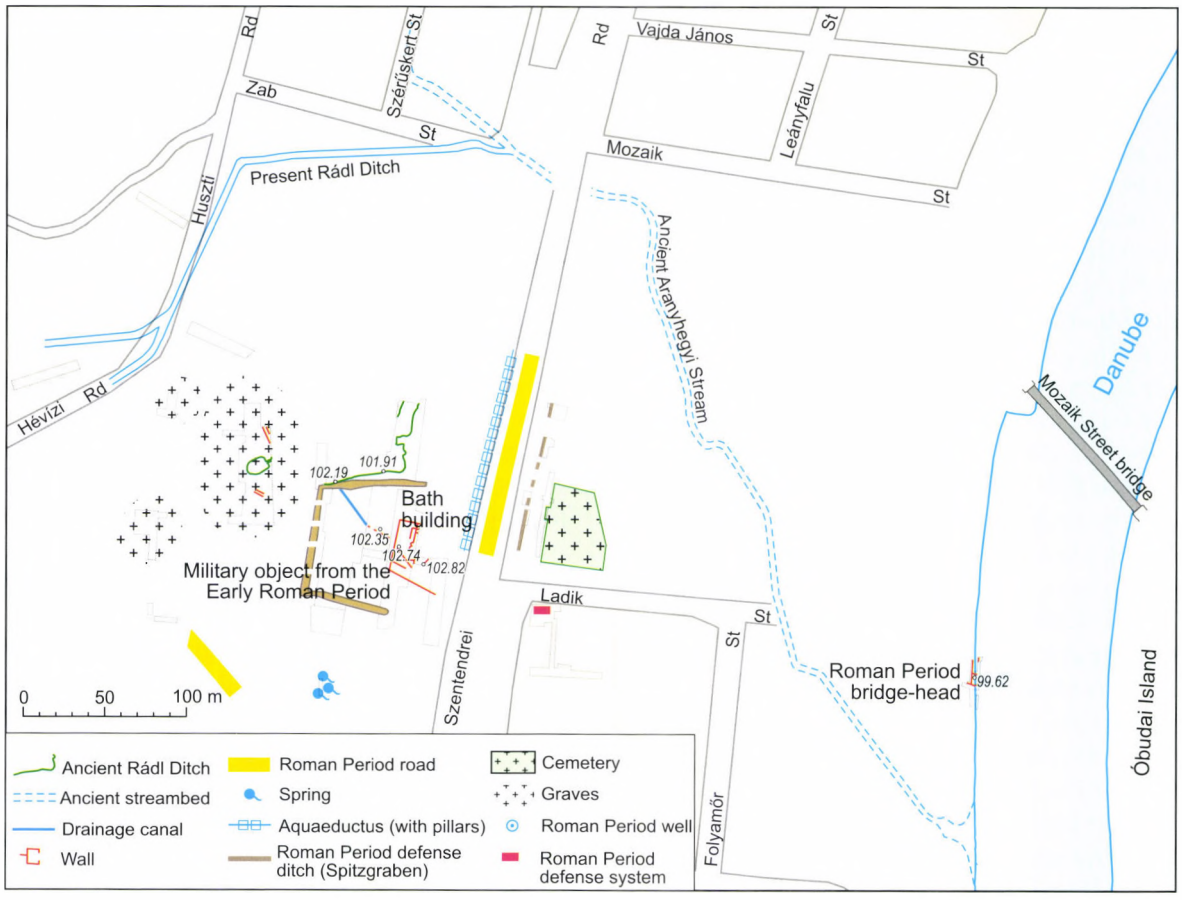


Fig. 21. The area between the Civil Town and the Military Town (the environs of Filatorigát) (Paula Zsidi – Anikó Kovács – Mrs. A. Vándor)

an area of about 5,000 m^2 (ZSIDI 1998/3, 2000/1, 2001/3).[60] The results of research demonstrated that the area was inhabited and used almost continuously from prehistoric times though the Roman and Migration periods till modern times.

As far as is known today, the earliest settlement in the area dates to a later phase of the Late Bronze Age (between 1000 and 800 BC). It is represented by some stray finds and segments of some subterranean features belonging to the Urnfield Culture. These features are especially dense in the Eastern part of the zone. This part of the area was at the highest point above its surroundings while, at the same time, it was rather near the stream flowing into the Danube. Because of the erosion of the "sand-bank" the depth of the bottom of the only feature which can be connected with the Bronze Age was found almost at the same level as migration period features while the bottoms of the subterranean features from the early Roman Period are usually situated at a much deeper level.

The three different Roman Period phases left more definite marks on the area. As for the building-over of the area in the Roman Period, besides the points of view mentioned above, the North–South road, together with the aqeduct running along in its Western side which ran in the path of the present Szentendrei Road played important roles. Óbudai Island was similarly important. The most suitable ford over to the island, as seen above, was within the area of the excavation. Most probably the location of the first Roman Period feature in the area was determined by strategic reasons The destruction layer over the military feature fortified by defensive structures dates to the end of the 1st century AD. Unfortunately, due to the continuous erosion of the raised sand bank, the remains of subterranean elements mostly came to light missing their floor level. In the following phase of the Roman Period, in the 2nd–3rd centuries AD,

[60] For recent research ZSIDI 2002/2.

the area was located by the Northern margin of the Military Town along the road leading to the Civil Town near a road junction leading West. Its connection towards the East, the Danube River, was already closed at that time by the aqueduct. At the same time, the location was an important factor from the viewpoint of the bath building there. This is shown by the position of the bath byt the Eastern margin of the excavated area, adjusted to the former road and the aqeduct leading along its Western side. The bath, with floor heating, piped water and a drainage system, supposedly belonged to the building complex of the inn *(deversosium?)* by the road junction. Terrazzo floors indicate the surviving inner levels of the bath (at a height of 102.82 m aA) while the outer levels are marked by the levels of the sewer covers of the excellently constructed system of canals which survived here and there in its original condition (at altitudes of 102,74 m, 102.35 m and 102.19 m aA). The newly opened grave sectors of the nearby cemetery (ZSIDI 1990/1) appeared in the eastern neighbourhood of the ruined buildings in the 4th century AD when the bath was already not in operation.The use of the area for burials means also the last phase of the Roman Period.

Roman Period burials formed groups of graves (ZSIDI 1996–1997). The ground-plan of the cemetery clearly demonstrates that within the area marked out for graves, the parts that were first used lay in a higher position above the surrounding, often marshy areas. Therefore, in order to make access to the graves easier the marshy areas were quite often paved by stone.

After the late Roman Period, a 7th–8th century AD Avar settlement was established in the neighbourhood of the Roman ruins which at that time were certainly still visible on the surface, making use of the advantage provided by the still raised sand-bank. About 20 semi-subterranean houses from the settlement have been excavated, though some of the other minor features found in the area which did not contain finds may also date to the Avar Period.[61] Some of the houses, mostly with a uniform structure and almost uniform dimensions, formed groups near to each other, almost in a semicircle, encircling the ruins of the bath built over the Roman Period road. In the majority of the houses remains of crumbled hearths were found, usually in the North-Eastern corners, opposite to the entrances. The material from the ruins of the nearby Roman Period buildings were readily used by the Avars for building the hearths and for "furnishing" the houses.

The Medieval Period in the area is only represented by a few ceramic shards. Traces of it could be observed in the earlier lower-lying part of the area suggesting that the place was waterlogged even at that time. The geographic conditions in the area changed once and for all when dams were built there in the last decades of the 19th century together with considerable infilling thus covering earlier archaeological and geological layers with a several metres thick bank of earth.

4.3.4. The villa estates

Roman Period villa estates between the Military Town and Civil Town in Aquincum

Land distribution had already taken place in the area West of the Civil Town in the time of either Traianus or Hadrianus *(Figures 16* and *17)*. After the Markomannic wars at the latest the lots were used mostly as villa estates. This area, nearly as large as a county, was under the authority of the municipality. The part situated near the town and extending as far as the foothills of the Buda Hills was a low-lying plain and therefore earlier research had excluded (T. NAGY 1971/1) any possibility that there could be a Roman Period building there. However, as a result of recent research, especially several new excavations carried out in connection with the development of the region, it is now known that remains of several villa estates can be found on slightly elevated terrains in the area in question. The presence of natural water was an important factor in locating almost all the villas. In case of the villa at the Mocsárosdűlő, even the modern name refers to a natural lake in Csillaghegy where a group of still active springs can be found in the immediate vicinity of the remains of buildings. Below the remains found in the Szőlőkert Street were also traces of the activity

[61] It has already been mentioned above that the "sand bank" that was dug into featuring in different periods was continuously exposed so that the digging levels themselves were exposed to erosion and therefore did not usually survive. Thus, the different phases contained neither archaeological material or structures allowing their clear-cut identification and making their separation very difficult.

of former springs[62] *(Picture 11).* Furthermore, the places of the villas also reflect the Roman Period limitation system (ZSIDI 2004, 2005, 2007, 62–65).[63] Below we will deal with those villas which recently came to light from the first "row of lots" in the western neighbourhood of the Civil Town, describing them going from North to South (*Figure 22*).

The villa estate in the Mocsárosdűlő

This villa lies in the part of town presently called Mocsárosdűlő. It is situated West of the Római open-bath, at the foot of Arany Hill (*Figure 22*). Between 1986 and 1989, both the *pars rustica* part and a considerable part of the *pars urbana* area was separated from the rustica part by a fence.[64] At present, this villa is the only one of the villa estates near Aquincum where the two parts of villa estates with different functions can be clearly demonstrated and appear as separate entities as regards their architecture as a result of large-scale excavations.

The ground plan of the *pars urbana* is the more complete one *(Figure 23)* and represents the type of villa characterized by a central courtyard, an atrium. Unfortunately, mostly only the foundations of the walls survived remained so the positions of the original floor levels can only be surmised. Similarly, only very few items from the inside decoration survived. However, the finds which came to light at the villa can provide some information on the function of the different sections, rooms in the building: kitchen, storage and dwelling rooms. The existence of floor-heating may be supposed on the basis of the presence of an outer furnace that served as part of the heating system.

The *pars rustica* part of the villa was separated from the dwelling area by a stone wall. Features in the *pars rustica* suggest that some kind of economic activity was carried out there. The building identified as a granary reflects plant cultivation. The lime kiln, the brick-kilns and the well, and also the system of ditches around them testify that some kind of industrial activity took place there.

On the basis of the finds which came to light at the villa, economic activity began there at the end of the 2nd century AD or at the beginning of the 3rd century AD and, considering the presence of the brick-kiln, it was still on-going in the middle of the 4th century AD.

The villa at Csillaghegy-Pusztakúti Road

The so-called Csillaghegy-Pusztakúti Road villa is situated in the foreground of the Buda Hills where the hills and the lowlands meet each other (*Figure 22*) and to the South of those springs at Csillaghegy already in use in the Roman Period. The villa was connected with that Roman Period road that ran through the Üröm Valley reflecting its favourable geographic position. The trial trenches of the excavations were only restricted to a small area and large surfaces were not excavated. The primary aim of the excavation was to determine the extent of the villa, which – according to the excavator – spread roughly over a surface of 30 x 30 m, on the basis of the test trenches, except on the Eastern side. To the East, the remains of the villa continued under Pusztakúti Road (PETŐ 1993). Research carried out in 2000, however, did not reveal Roman Period remains on the other side of this street. Historical layers found at a greater depth below the modern fill belonged to some features from a Late Bronze Age or perhaps Early Iron Age settlement (LASSÁNYI – SZILAS 2001).

On the basis of the excavated wall remains, the ground-plan of the villa showed this building complex was a "villa with a lateral passage" type. Its closest analogy is the minor Csúcshegy

[62] Compare with chapter 5.2 in this volume.

[63] P. Zsidi observed (ZSIDI 2004, 342) that Roman Period villa estates are situated in several rows depending on the terrains at different altitudes. Here, we deal only with those villas that lie within the area investigated. On the villas on Csúcshegy and Testvérhegy, together with earlier literature see: O. Láng: Late Roman building complex on the territory of Harsánylejtő. (Bp. III, Csúcshegy–Harsánylejtő, lrn: 20645/1–7, 20655/2–43, 20656/2, 20646/1) Aqfüz 15 (2009) 75–85. O. Láng: Medieval settlement traces and Roman Period Building remains in the area of Csúcshegy-Harsánylejtő. (Bp. III, Csúcshegy-Harsánylejtő. Lrn: 20645/1–7, 20655/2–43, 20656/2, 20646/1) AqFüz 14 (2008) 133–140. O. Láng: New data on the topographie position of the so-called Testvérhegy villa. (Bp. III, 310 Bécsi Road) AqFüz 10 (2004) 90–105. K. Anderkó: Investigations in the eastern foreground of Testvérhegy. (Bp. III, 262 Bécsi Road, Lrn: 20089/13 AqFüz. 14 (2008) 105–118. Z. Havas: Recent excavations on the territory of the Testvérhegy villa. (Bp. III, Lángliliom Street, Lrn: 20023/27; buildings 15, 15, 17.) AqFüz 15 (2009) 86–91. (the editor)

[64] The villa was excavated by Erzsébet Márity, the excavation was the subject of two theses for university graduation, both under the guidance of Dénes Gabler: SCHERLEIN 2001, KIKINDAI 2002.

Fig. 22. Directions of the Roman Period location of town boundaries (limitatio) and the places of villa estates on the slopes of the Buda Hills and in their foreground (made by Krisztián Kolozsvári after Paula Zsidi on the map of C.P. Vasquez). – 1 = Szőlőkert Street; 2 = Kaszásdűlő – Csikós Street; 3 = Mocsárosdűlő; 4 = Csillaghegy – Pusztakúti Road; 5 = Testvér Hill; 6 = Csúcs Hill

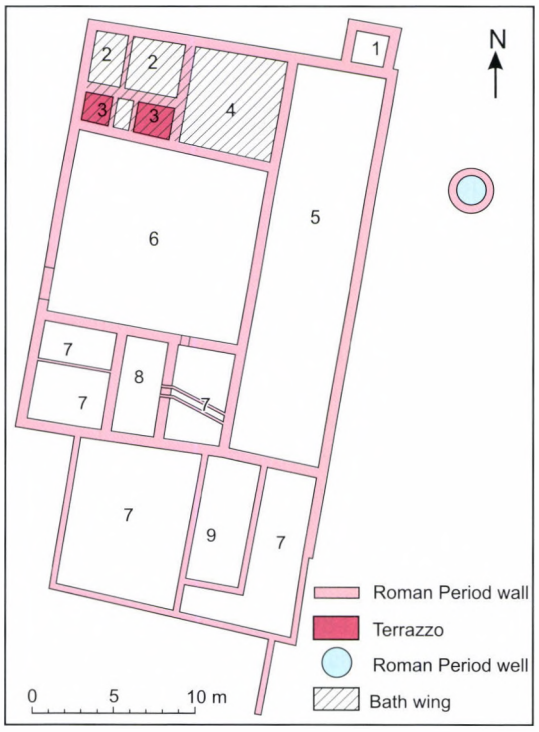


Fig. 23. The main building of the villa estate excavated in the Mocsárosdűlő (Katalin H. Kérdő – Anikó Kovács after Erzsébet Márity – András Kikindai). – 1 = Protruding frontal part (projection, risalit); 2 = Bath; 3 = Basin; 4 = Dressing room (apodyterium); 5 = Portico with colonnade (porticus); 6 = Courtyard; 7 = Room; 8 = Heating chamber (praefurnium); 9 = Kitchen

villa. Only one of the surviving premises from the villa could be measured correctly. The Roman Period level could be identified on the basis of its stone slab pavement which according to the excavator may have been part of a formal courtyard with pillars (*peristylium*). In the absence of further excavation it is not possible to say more about the building or its ground-plan. The nature of the villa finds have led the excavator to suggest that the villa had. The first phase was in the middle of the 2nd century AD while the other, representing a major alteration, took place in the 3rd century AD. However, on the basis of finds, the building was inhabited in the late Roman Period as well.

The Kaszásdűlő – Csikós Street villa

The villa is situated near the Civil Town of Aquincum, about 500 m from the South-Western corner tower (*Figure 17*, ZSIDI 1991, 1994). From the South, it represents the second unit in that "rows of lots" situated on low lying areas between the gentle slopes of the Buda Hills and the Roman town *(Figure 22)*. It was situated about 500–800 m from the main known Roman Period roads. A small floor level marked by pebble-work and, here and there, traces of a stone slab pavement in front of the entrance portico (*porticus*) of the building suggests that it connected the villa with roads carrying heavier traffic *(Figure 24)*.

The territory around the villa – being low-lying – was less suitable for settlement. Excavated ditches as well as traces of ditches, could be detected together with the high ground-water table *(Picture 27)* showing the former marshy character of the territory. The villa itself was built on a minor elevation, as is also clearly visible in a profile established South of the building (*Figure 24, profile A–B)*. In the part of the area closer to the villa, the undisturbed yellow subsoil was nearer to the present surface. The remains of a Roman Period building came to light during modern levelling work.

The orientation of the building was exactly East–West *(Figure 24)* and – also partly considering the road network – its entrance was established in a location that protected it from the prevailing North-West winds. There is very little data on the water supply for the villa. In spite of its relative proximity to the aqueduct, no trace of water pipes, wells, or cisterns could be found in the excavated area. Perhaps the circular pit found in one of the rooms of the building served to collect water *(Figure 24, profile C–D)*. Its gravelled fill, suitable for filtering water, can be seen in the profile drawing.

Almost all of the villas in the neighbourhood of Aquincum under went several altera-

Picture 27. Ruins of the excavated Roman Period villa flooded by ground-water (Kaszásdűlő – Csikós Street)

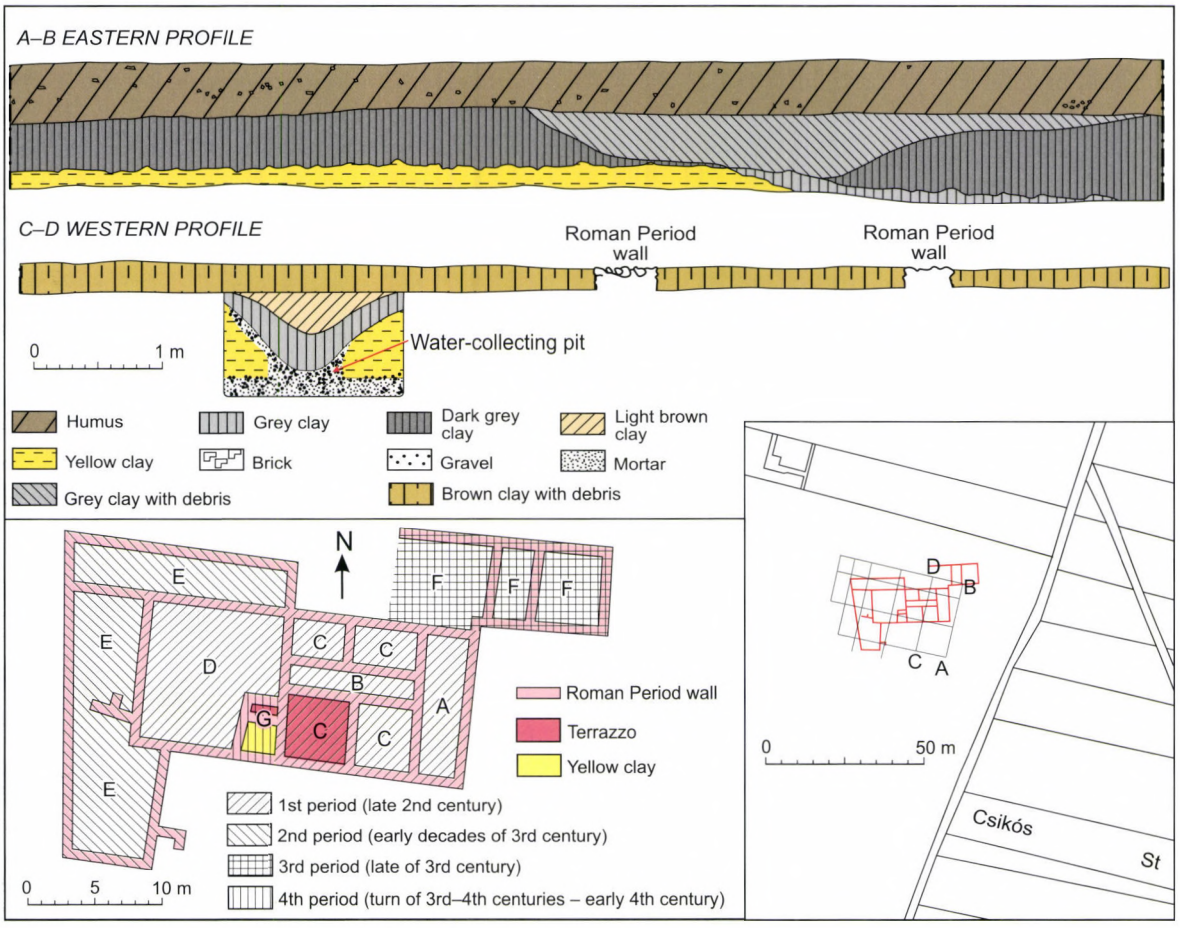


Fig. 24. Plan of the Kaszásdűlő – Csikós Street villa and its characteristic profiles (after Paula Zsidi – Katalin H. Kérdő – Anikó Kovács). – A = Portico; B = Central corridor; C = Living room; D = Courtyard; E = Workshop, store-room, stable; F = Extension; G = Sanctuary with two rooms

tions. Some cautious consequences may be drawn from the history of the building of the Kaszásdűlő – Csikós Street villa as regards the farmstead around it. The simple corridor villa with four rooms and an entrance *porticus* was erected at the earliest in the last decades of the 2nd century AD. While comfort installations (floor-heating, water supply, canalization) were not found in the building, the carefully made *terrazzo* floor suggests that it was a dwelling. The products of pottery workshops that operated in Aquincum before the war are less characteristic of the earliest finds compared to those finds with a chronological value come mostly from workshop functioning after the war. It seems obvious that the development of the farmstead around the villa made necessary the enlargement of the building in the decades after the turn of the 2nd–3rd centuries AD. It was at that time that the open courtyard on the side opposite the entrance was surrounded by rooms serving as storage room, workshops or perhaps stables. The finds from this period are characterized by a majority of imported ceramics and by the more frequent occurrence of coins. Existence at the certainly prosperous farmstead was disturbed by Barbarian attack about AD 260. Though a definite destruction layer did not come to light, the finds demonstrate that the inhabitants of the villa were unable to continue their usual way of life.

By the end of the 3rd century AD the farmstead around the villa began to flourish again. Alhough the inhabitants of the villa did not use imported goods, characteristic of that period, and luxury decorative elements were no longer used the building received a new look by the construction of the Northern row of rooms. During the 4th century AD there were no enlargements connected with economic activities with only traces of minor alterations. A small

chapel with two rooms was built, supposedly for meetings of Christians, in one of the corners of the open courtyard, probably at the turn of the 3rd–4th centuries AD or at the very beginning of the 4th century AD. The villa was inhabited until the end of the 4th century AD and for a while it seems to have functioned as a repair shop for bronze objects, which, among other things dealt with the repair of broken safety catches on brooches. The building was abandoned and emptied by its inhabitants, most probably at the very end of the 4th century AD.

The Szőlőkert Street villa and its neighbourhood

Remains of buildings belonging to another villa estate and a burial place came to light a few hundred meters to the South from the Kaszásdűlő – Csikós Street villa *(Figure 25).* Despite the fact that the dimensions of the excavation, connected to an investment, were determined by the extent of the modern building, several periods from the edge of the 2nd–4th century AD villa estate were identified. Furthermore, features connected with the Roman Period use of the territory came to light both from the period preceding the villa estate and from the period succeeding the abandonment of the buildings of the estate (ZSIDI 1996).

Apart from the coins, which date from the middle of the 2nd century AD to the very end of the 4th century AD and occur within the find assemblage in equal numbers, a considerable quantity of imported ceramics (*terra sigillata)* and coarse ware as well as bronze objects for daily use and parts of dress came to light. Characteristic finds include a bronze stylus (*stilus*) and the open-work disc brooch with silver inlay. Moreover, the dozens of iron horseshoes and iron sickles came to light, which, on the basis their provenance probably date the latest period at the site. Of especial note are a fragment of a statue built as *spolia* into a later wall and fragments from multi-layer wall paintings belonging to several periods (*Picture 28).*

Picture 28. Fragment of a statue from the excavation in Szőlőkert Street

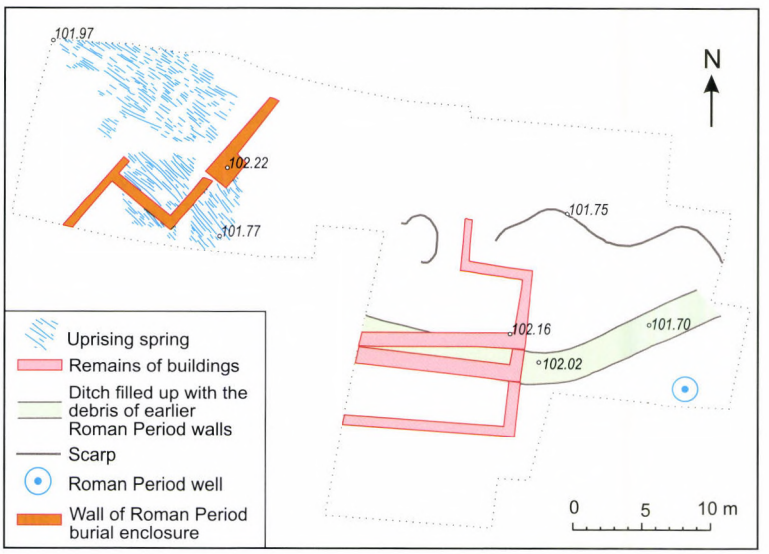


Fig. 25. The area of the Szőlőkert Street villa estate (Paula Zsidi – Anikó Kovács – Mrs. A. Vándor)

As already mentioned above, for the time being, without a detailed study of the finds four main periods in the area can be distinguished. The earliest period is represented by a system of timber-slots and post-holes and it is thought that the water channel marked by stones encircling the perimeter of the villa estate date to this period as well. The dating is reinforced because the remains of this system reflect the existence of a wooden structure building do not occur South of the channel, that is, the system was situated within an area surrounded by the channel. Since only those parts of the con-

structions survived which lay below this level, and they themselves are the remains of pulled out and carefully filled back (condensed) architectural forms, it is not possible to determine either their exact absolute chronology or their function. It is probable, however, that they were in use before the construction of the villa estate in a period preceding the Markomannic wars. Considering the presence of the nearby spring and cemetery (the so-called Benedek Elek Street cemetery) they could not have been either dwellings or out-buildings but rather must have has a cultic function.

The next period was especially visible in the Southern part of the area. It can be characterized by debris consisting of small fragments of wall-paintings, fragments of mortar and building elements that had been filled back into very shallow, pulled-out walls (?) foundations with clearly distinguishable edges. This debris material can be found also on top of the muddy fill of the water channel. On the basis of the few data that are available it is not possible to decide whether the pulled out parts had been filled in with their own demolished material or whether this material was transported there from some other nearby buildings in the villa estate. Those stone walls, however, which in the Northern part of the excavations were found in a, more or less, preserved condition – some still used in later periods as well – do not suggest that the walls were plastered or painted. At any rate it is sure that after the destruction of the building situated here in the second period at the site, the edge the built over area shifted farther to the North again.

The characteristic building from the third period is a broad, East–West running wall which was partially built on one of the wall foundations from the 2nd century AD. On the basis of its position and its dry masonry structure, this may be one of the surrounding walls of the farmstead. The burial enclosure, too, which came to light in the Western part of the area, may come from this period. This enclosure was added to a North-East to South-West running fencing wall (?) with a decorated inner wall. Altogether, 17 graves came to light in this 10 x 5 m territory. A bit more than half of the graves are inhumation burials (among them, were tiled-roof graves) although urnless cremation burials with modest grave goods were found there as well. The finds in this part of the cemetery help in determining the absolute date the absolute chronology of this period. Both objects of every-day use and the very poor ones belonging to dress as well as the coins date the use of the burial enclosure to the second half of the 3rd century AD. Those large fragments of wall-paintings may date to this period as well. The fragments were found among the ruins of the East–West running surrounding wall and supposedly came from a nearby building with abundant decoration *(Picture 29)*. On the basis of the finds, we have to reckon with the latest Roman Period (fourth period) as well.

This period can be observed on top of the rubble of the East–West running dismantled ruined fencing wall. This levelled, smoothed down horizontal surface with stones ran in an East–West direction just like the fence wall, and it was perhaps used as a road from the very end of the 4th century AD basis of the coins found on its surface.

Picture 29. Burial place belonging to the building of the villa, surrounded by a wall. The wall of the burial enclosure was dug into a surface with ridges created by the activity of an earlier spring.

The horseshoe-finds which came to light here as well date to this period. By that time, the territory of the villa estate had already been either abandoned or the economic activities were still continued in the area, though, in a reduced space.

During the excavation, three wells were found, though owing to the pressing time limit and the very high ground-water table we could not excavate them entirely. At present, their content is preserved intact under the modern building. Consequently, the dating of the wells is uncertain. It may be stated, however, that the well under the Eastern wall of the burial enclosure dated to one of the first two periods.

On the basis of the remains found, it cannot be excluded that these remains did not form an independent settlement unit, but were part of the Southern part of the villa estate to which the building situated 300–350 m distance to the North of the present excavation area also belonged and which became known as the Kaszásdűlő – Csikós Street villa (ZSIDI 1994).

Here, some graves from a 2nd century AD cemetery segment which came to light in its vicinity should be mentioned as well as some architectural carvings and funerary statue fragments from a monumental tomb, the latter found within the renovated stony surface of a nearby North-West–South-East running road (LASSÁNYI 2002).

The burials in question certainly come from a period pre-dating the establishment of the villa estate and neither can it be excluded that these graves represent the same chronological horizon as the wooden structure construction preserved below the villa.

4.4. Military forts in Óbuda

Roman Period military forts were built along definite principles and strict rules as regards their ground-plan. From the 2nd century AD, the forts were usually built in stone. Their ground-plans were patterned after the Roman army's marching forts. The main reasons for keeping this building standard was to insure the fastest possible mobilization, defence and an efficient functioning.

The two basic requirements were: the existence of certain building types within the forts and a layout designed according to rules. The forts with a rectangular ground-plan were surrounded by moats from the outside. The walls of the fort were also reinforced on its inner side by a causeway with a walk-way on top. Each of the four walls had a gate strengthened by towers. The main roads led into the centre of the fort. The headquarters building of the fort (the *principia*) lay at the point of intersection of the two main roads. Military parades and other public events took place here in the fort. Besides the quarters for high ranking officers and troops the baths and out-houses were located within the walls of the fort as well.

4.4.1. The ala fort at Óbuda

The first known military fort of cavalry troops at Óbuda *(Figure 26)* was built in AD 73 during the reign of Emperor Vespasianus (AD 69–79) at a distance of about six Roman North of the Víziváros. From that time on, this place became the permanent location of the Roman army fort stationed in Aquincum. There is an inscription which was identified by J. SZILÁGYI as a building inscription from the time of Tiberius, although when two other fragments of this inscription came to light later it became clear that its revised interpretation was the correct one – with the difference that the builder unit was the *ala I Tungrorum Frontoniana.*[65] The fort was built on the banks of the Danube, more or less, opposite to the Northern tip of Margaret Island, at the end of the North-West–South-East running road leading from Pilisvörösvári Valley *(Figure 16).* It was erected within the framework of the large-scale *limes* fortification programme completed under the governor, *C. Calpetanus Rantius Quirinalis Valerius Festus.* Traffic over land as well as the ford over the Danube could be controlled from here.

In contradiction to the earlier hypothesis, the place of the fort was not within the later legionary fortress, but was the same as the locality of the building inscription. Between 1980 and 1990, several rescue excavations and excavations were carried out within the territory of the *castellum.*[66] These excavations resulted identification of the exact place and extent of the fortress that lay within the area between present-day Árpád fejedelem Road and 125–166 Lajos Street. (KÉRDŐ – NÉMETH 1986, NÉMETH 1990, 1993) *(Figure 27).*

[65] SZILÁGYI 1938, 287 etc., TÓTH – VÉKONY 1970/1–2, KÉRDŐ – NÉMETH 1986.

[66] The enumeration of the 17 rescue excavations carried out in the area: NÉMETH 1993, 57, notes 2 and 5.

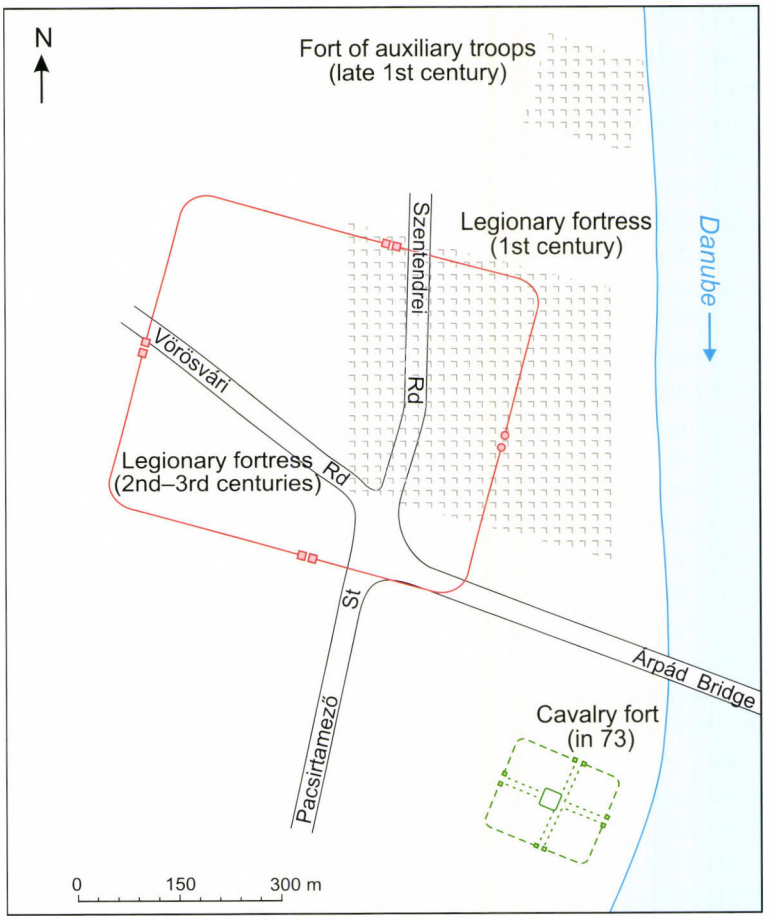


Fig. 26. Military forts at Óbuda in the 1st–3rd centuries AD (after Margit Németh)

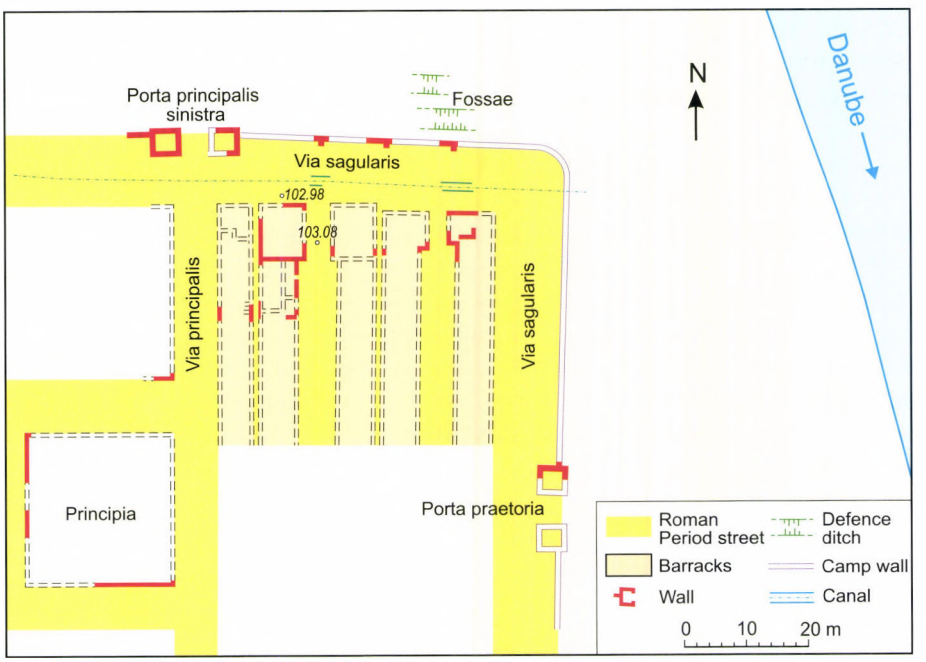


Fig. 27. The plan of the cavalry troop fort at Óbuda (in AD 73, after Margit Németh)

In several places along the Northern side of the fortress. There were two V-shaped ditches, so-called *Spitzgrabens* running along the outer side of the wall. Their fill closer to the wall comprised stone debris while the fill farther from the wall consisted of stone debris, fragments of clay and clay bricks as well as charcoal. No earth-and-timber structure fortress wall was found, however, at the place we investigated. The Eastern wall of the fortress which came to light as well as its position helped identify the location of the Eastern main gate, the *porta praetoria*. So far, we have not excavated either the corner tower or lateral tower.

The Northern gatehouse, the *porta principalis sinistra,* is known along with both of its towers. The gatehouses had rectangular ground-plans of 6.7 x 6.5 m and stood out from the face of the fortress wall by 0.8 m. They were covered on the outside by small ashlars. The gateway between the two gatehouses could be 7.5 m wide and most probably it was divided into two parts by a central pillar. Knowing the position of the gatehouses it may be asserted that the fragments of building inscription were most probably deposited when the gate was levelled.

The exact place of the *porta praetoria*, the Eastern gate, was identified by the segments of internal roads and buildings known so far. In 1990, during short rescue excavation, the junction of the Eastern wall of the fortress and the Northern tower of the gate

could be excavated. However, because of the conditions of the terrain there was no possibility of excavating the Southern half of the tower and the entire gate-building. (NÉMETH 1993, 55 etc.). The inner dimension of the tower in an East–West direction is 5.2 m. The thickness of the wall of the tower on its Northern side is 1.2 m and the thickness of the Eastern wall of the fortress was 1.1 m. The foundation also continued beneath the tower. In contrast to the Northern gate, here, huge ashlars were placed on the foundation of the wall of the tower which suggests a stronger, more monumental construction for this gate building. The gateway, which most probably was divided into more than one part, was definitely situated under the road way of present-day Tél Street while the Southern gatehouse may have been situated under the Southern part of the road way or in its immediate vicinity. Features belonging to earlier construction periods could not be observed within the small excavation area, except for a thin, clayey level found below the construction level.

The layout of the North-East quarter of the *castellum* – that is, the left, *principalis*, side – as well as paths of the *via principalis* (the North–South running main road of the fortress) and of the *via sagularis* (the road along the inner side of the fortress wall) could be clarified. Furthermore, parts of streets bordering the *principia* (the headquarters building) on the North and West as well as roads running between the barracks came to light. Parts of sewer pipes were also found.

The *principia* was a building of about 30 x 30 m. The identification of its location was based exclusively on earlier rescue excavations. During these observations, the Western end-wall, the North-Western corner and part of its Southern wing were surveyed. There was no possibility of investigating its inner part or its earlier earth-and-timber construction period.

Parts of five stone barracks situated parallel to the *via principalis* came to light in the left *praetentura,* in the North-Eastern quarter of the fortress. The length of the buildings – and thus also the number of the *contubernia* (lodging units s) within them – remain unknown although it is known that they are each 9 m wide. The *porticus* (a portico with a colonnade) is 1.2 m wide by the space for the troops. The dividing walls between the *contubernia* were built of clay.

At some points, parts of buildings from earlier construction periods came to light: plastered clay walls with stone foundations, their orientation and sometimes even their path were mirrored in later stone buildings. A rise in level could be observed in the streets.

The North–South extent of the *castellum* may have been around 140 m, while its East–West extent may have been ca. 180–200 m. Though several questions remained unanswered, it may be stated that early construction periods could be dated to the end of the 1st century AD, while stone buildings were later erected in the first half of the 2nd century AD. The fortress was most probably used till the end of the 2nd century AD, although the troops later occupying it are not known.

In the territory the North of the later legionary fortress we must reckon with the existence of another earth-and-timber construction fort for auxiliary troops at the end of the 1st century AD which was used for a short time *(Figure 26)*. Only the profile of a moat came to light from this fort [67] which was filled in at the beginning of the 2nd century AD. A public building was erected in the territory of this fort (SZIRMAI 1990, 684 etc, NÉMETH 1991, 92, 98).

4.4.2. The 1st century AD legionary fortress

The first legionary fortress in Óbuda was built during the reign of *Domitianus*, between the two *auxiliaris castellum,* on the banks of the Danube in the 1st century AD *(Figure 26)*. Further research is needed to identify its exact location, inner layout and construction phases. The existence of a fort with a diamond-shaped ground-plan, published earlier (T. NAGY 1971/2) was not confirmed by the excavations. At the same time, at several points, remains of certain defensive works – mostly profiles of *fossae* (ditches) which do not fit into any known the ground-plans so far could be observed.. Therefore, it must be supposed that the best known 2nd–3rd century AD legionary fortress had several antecedents. (NÉMETH 1991, 92, 98, NÉMETH 1991–1992, 82 etc., NÉMETH 1997, 255). The earliest fortress was certainly an earth-and-timber construction, though the existence of a construction phase with stone buildings preceding the 2nd–3rd century AD fort cannot be excluded although at least in part it differs.

[67] The excavation by Krisztina Szirmai in 1981, see FORSCHUNGEN 2003, 335, 354. Plan 5, No. 22 = Bp. III, 14–16 Folyamőr Street, BudRég 25 (1984) 464, No. 38.

4.4.3. The 2nd–3rd century AD legionary fortress

The new legionary fortress (*Figures 26* and *28)* was built during the reign of Hadrianus (AD 117–138), West of the earlier one, farther from the Danube, and with its *praetoria* front facing the river. This complex of buildings covering an area of 476 x 570 m was already constructed in stone and - apart from some new constructions or rebuildings – its location, inner layout remained mostly unchanged till at least the turn of the 3rd–4th century AD. Its study was hindered by the fact that investigations over larger surfaces in this area were almost impossible.

There was a single ditch running along the Western side of the fortress a single ditch. On the other side, three ditches were observed during the excavations. Among them contemporary were two *Spitzgraben*-type ditches while the latest one was a wide, trough-shaped ditchor *Sohlgraben*. The road running along the outer wall of the fortress, the *berma*, and the roads between the ditches were paved or had a gravelled pavement.

The 1.4 m thick fortress wall was covered on the outside by a pedestalled cover with ashlars and rounded cornices above. A causeway with stone foundations reinforced the wall on the inside with a walk-way on top. In the second half of the 3rd century AD, this causeway was renovated, although at certain points it was pulled down. The fortress wall was strengthened by set-back towers. Two of these towers on the *praetoria* front have been excavated. All four gates of the fortress could be localized including (*Figure 28.* 13–16), the Eastern gate – the *porta praetoria* – and the Southern one – the *porta principalis dextra* – were excavated more completely (PÓCZY 1976/1, 1976/3, PÓCZY – NÉMETH – SZIRMAI – KOCSIS 1986, PÓCZY 1990, NÉMETH 1991, 92) (*Pictures 30* and *32).*

The Southern gate, which consisted of two towers with rectangular ground-plans and a passage divided into two parts (*Figure 28,* 15), has an area of 31.5 x 12 m. The width of each of the passages was 3.5 m. The thickness of the tower walls which were built of limestone ashlars was 1.5 m. The gate, built in the middle of the 2nd century AD, was damaged during the war of AD 260. After the gate was rebuilt,only its West passage was kept in use (KOCSIS 1989).

The Eastern gate (*Figure 28.* 14) dates from a later period. Supposedly, it was erected during the reconstruction works during the reign of *Gallienus* (AD 253–268).[68]An octagonal tower Római Strandfürdő to the Civil Town, the Military Town and the legionary fortress. Later, another pillared aquaeduct provided water for the Military Town and the legionary fortress from the Northwest.[69] Main sewers transported sewage water towards the Danube from the network of channels established for conducting both meteoric water and sewage as well as from the channels emerging from the Eastern gate and from the North-Eastern and South-Eastern corners of the fortress. The inclination of the channel coming out from the North-Eastern corner of the fortress was about 1 m along a section of about 120 m (*Figure 28.* 28).

The alterations carried out several times on the buildings of the fortress were not confined in every case to restoration after damage caused by wars. Especially in the Severan Period (AD 193–235) they testified to the good financial situation of the army and its demand for representation, occasionally even luxury. In spite of these alterations, the basic structure of the fortress remained, more or less, intact till about AD 330.

4.4.4. The 4th century AD legionary fortress

At the beginning of the 4th century AD fundamental changes in the structure of the fortress took place when defensive demand increased. These changes, however, not only took place in the public administration of the province, but were also reflected in the topography of the fortress and it *canabae*. That is, in the first half of the 4th century AD, most probably during the rule of Constantinus I (AD 306–337), a new fortress was constructed directly on the Eastern wall of the old fortress, using its Eastern, *praetoria* side, extending it both to the North and

[68] A coin of Probus came to light in the gateway, PÓCZY 1990, 691.

[69] See also chapter 6.1in this volume, PÓCZY 1972, 1980/1–2, WELLNER 1973/1. Recently Anita Kirchhof excavated more of it. On the latest summary: KIRCHHOF 2009/3. In her paper, she plotted the line of the pillared aqueduct arriving at the legionary fortress from the North-West as well as that of the late Roman Period aqueduct with double pipes. In several places, conduits with ceramic pipes built into walls came to light, although for the time being very little data exist on them so that it is still not possible reconstruct the system of these aqueducts. (The editor.)

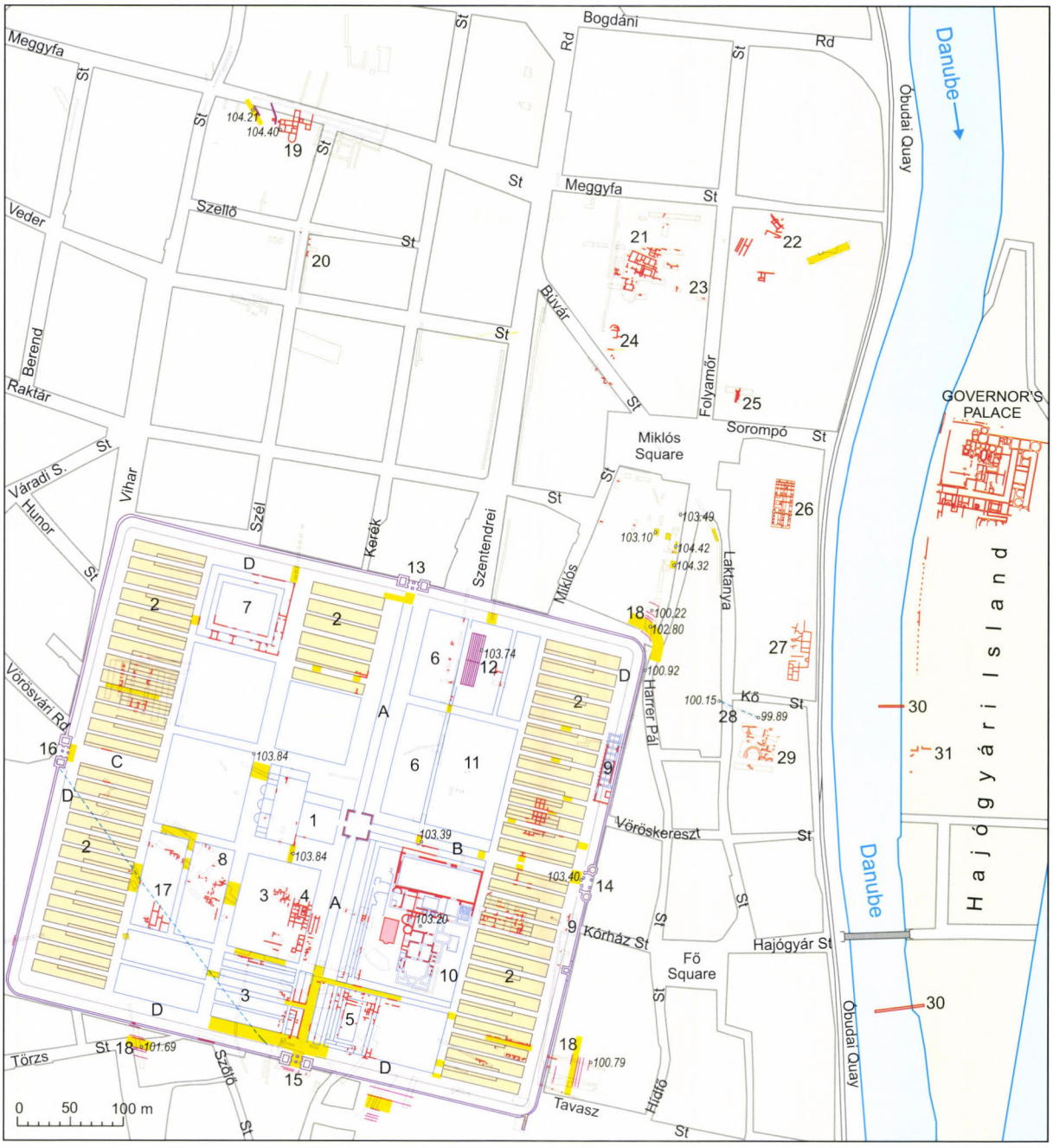
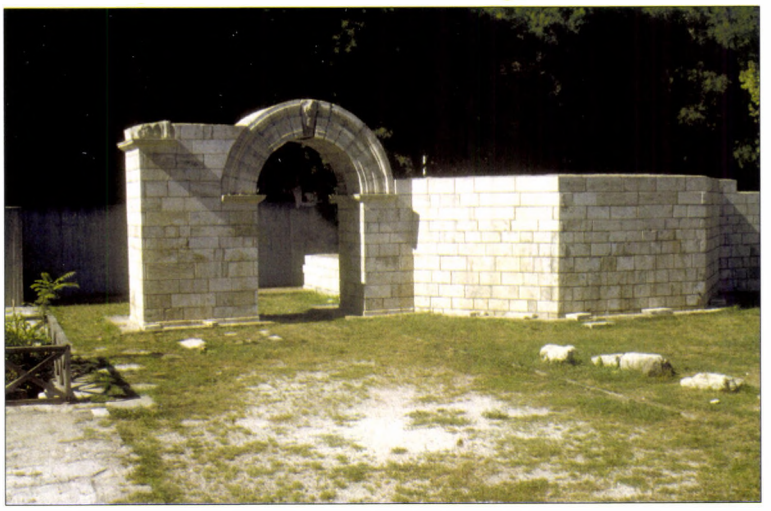


Fig. 28. The legionary fortress and the North-Eastern quarters of the Military Town (Katalin H. Kérdő – Anikó Kovács – Mrs. A. Vándor after Margit Németh). – 1 = Building of headquarters (principia); 2 = Barracks; 3 = Barracks of cohors 1; 4 = House of the centurio; 5 = House of the tribunus lacticlavius; 6 = Houses of the tribuni; 7 = Storeroom or workshop (fabrica); 8 = Oil-press; 9 = Workshop (fabrica) from the Late Roman Period; 10 = Bath (thermae maiores); 11 = Hospital (valetudinarium); 12 = Granary (horreum); 13 = Northern gate (porta principalis sinistra); 14 = Eastern gate (porta praetoria); 15 = Southern gate (porta principalis dextra); 16 = Western gate (porta decumana); 17 = Late Roman Period aqueduct; 18 = Road along the camp wall (berma); 19 = The so-called Hercules villa (Meggyfa Street 21); 20 = Urban villa (Szél Street–Szellő Street); 21 = Urban villa with peristylium (building complex in Folyamőr Street–Búvár Street); 22 = Urban villa (Folyamőr Street – Distillery); 23 = Urban villa (Folyamőr Street); 24 = Urban villa with sanctuary (Búvár Street); 25 = Urban villa (Sorompó Street 2.); 26 = Building of the commander (praetorium) or sanctuary; 27 = Bath (to the North of Kő Street); 28 = Main sewer ditch; 29 = Bath (to the South of Kő Street); 30 = Roman Period walls dredged out from the Danube in the 19th century; 31 = Southern closing wall of the building complex of the Governor's palace with tower; A = Via principalis; B = Via praetoria; C = Via decumana; D = Via sagularis



Picture 30. The Eastern gate of the legionary fortress of Aquincum (in present-day Budapest III, 7 Kórház Street)

Picture 31. The Southern gate of the legionary fortress of Aquincum with part of the *via principalis dextra* (in present-day Budapest III, Flórián Square)

South. The former moat was filled up and where the new fortress wall crossed it, a solid foundation established. The fortress created by these works occupied an area of 720 x 300 m and extended as far as the Danube (PÓCZY 1976/1, PÓCZY – NÉMETH – SZIRMAI – KOCSIS 1986) *(Figure 29).*

The outer side of the 3 m thick, emplecton (*opus caementicium*) fortress wall was covered by large ashlars. Many dressed stones from earlier periods were re-used in its construction (*spolia*). Several projecting horseshoe-shaped towers were found on the Western and Southern walls *(Figure 29,* 10) in the Southern half of the fortress while the Southern wall curved inward between the towers (KÉRDŐ 1976, FACSÁDY 1976/1). At some points on the Northern and Southern sides the ditch defending the fortress from the outside came to light as well (*Figure 29.* 10). As for the gates, only the Southern one between the two horseshoe-shaped towers (*Figure 29.* 9) has been excavated partly (PARRAGI 1976/1).

The road which led earlier along the Eastern front of the fortress and which was one of the main roads in the *canabae* had by that time become the North–South main road of the fortress (*Figure 29.* 6). Longitudinal, oblong buildings – storerooms and barracks – could be observed (*Figure 29.* 7) on the Western and Southern sides between the fortress wall and the main road. An East–West running road, forking-off from the main road was found also found in the latter place (*Fig. 29.* 8). Several earlier buildings were absorbed into the new *castra*, among them the large harbour building on the banks of the Danube (*Figure 29.* 5). Though excavations within the inside of the new fortress have only been restricted to a relatively small area and therefore relatively little is known about its buildings, a rather densely constructed building-complex could be observed in the Southern half of the fort. The greater part of these buildings was erected in the latest period of the fort's use, when its Northern section was abandoned, given up and the

Picture 32. The atrium of the house of a *centurio* (in present-day Flórián Square)

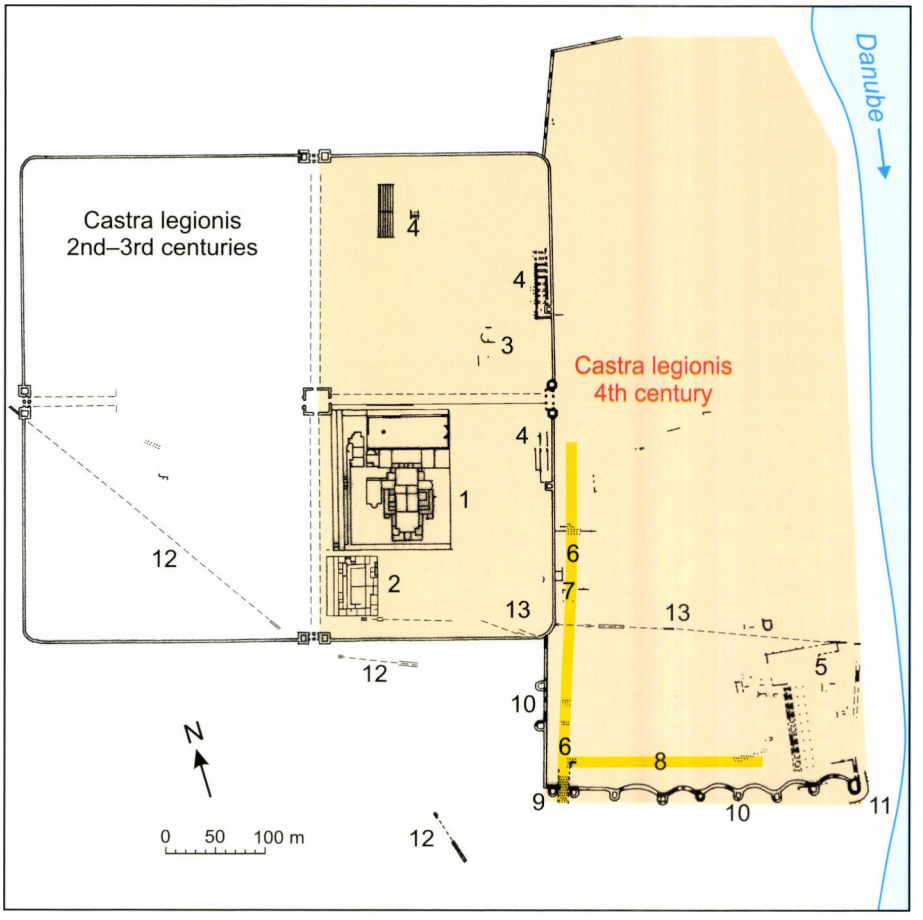


Fig. 29. The 4th century AD legionary fortress in Aquincum (after Margit Németh). – 1 = Palace of public administration; 2 = Formerly the house of the tribunus lacticlavius; 3 = Building with a hall and apse; 4 = Granaries (horrea); 5 = Earlier harbour building; 6 = North–South direction main road of Late Roman Period fortress; 7 = Store-room and barracks; 8 = East–West direction road of Late Roman Period fortress; 9 = Southern gate of Late Roman Period fortress; 10 = Towers of Late Roman Period fortress; 11 = Moat of Late Roman Period fortress; 12 = Late Roman Period aqueduct; 13 = Canal (2nd–3rd centuries AD)

fort narrowed down and, its space was reduced (PÓCZY – NÉMETH – SZIRMAI – KOCSIS 1986, 402, SOPRONI 1986, 413, NÉMETH 1991, 93).

Most part of the former legionary fortress was re-used. Some of the buildings, e.g. the barracks, were pulled down and new buildings with different functions erected over them – like a hall with an apse (*Figure 29.* 3) in the area of the former *praetentura* (SZIRMAI – ALTMANN 1976, TÓTH 1994). Other buildings, like the house of the *tribunus lacticlavius* (*Figure 29.* 2, KOCSIS 1991) continued to be used after some alterations. The largest building in the fortress, the bath (*Figure 29.* 1), was fundamentally rebuilt, the former basins filled up and a new bath-wing constructed from the West.[70] Though the function of the palace-like building created by these alterations has not yet been identified with any certainty, it is obvious that it had some military-public administration func-

[70] According to KABA 1991, 54 this was the private bath of the *praefectus*. See also chapters on history.

tion. It has been suggested that itmay have been the palace of the *dux*.[71] A North-West to West–South-East running subterranean aqueduct *(Figure 29.* 12), embedded within n the wall, ran between the former *porta decumana and porta principalis* (the Western and Southern gates of the fortress) leading towards the Danube, though through the ruins of the pulled-down buildings of the *retentura*. At this moment, however, its exact destination is unknown. Late Roman Period cemeteries were established among the abandoned ruins of the buildings (PÓCZY – NÉMETH – SZIRMAI – KOCSIS 1986, 402).

No positive proof exists concerning the exact date when the fort, reduced to an area of 300 x 300 m was abandoned. The fort itself stood for a long time after that with parts of its walls used even after the Hungarian Conquest when they were incorporated into the buildings of the new royal lodgings.

4.5. The Military Town

Military Town (*canabae*) was the name of that type of urban settlement which grew-up around the legionary fortress in the Roman Period. In Budapest it is located in today's District III in an area bordered by the Danube–Bogdáni Road–Hévizi Road–Bécsi Road–Nagyszombat Street. Therefore, it is correct to speak of the *canabae* only in connection with the presence of the legion, in the vicinity of the legionary fortress. Together with the re-building of the legionary fortress, the extent, character and internal layout of the Military Town, too, changed. The name of those smaller settlements with a rural character which existed around the forts of auxiliary troops partly before the legion was detailed here and partly contemporaneous with the legion's stay here, were called *vicus or vicus militaris.* The territories of the *canabae* and the *vici militares* quite frequently overlapped with each other in the above-mentioned area, although there are temporal discrepancies.

[71] At present, the residence of the *praeses* of Valeria cannot be definitely localized. See FITZ 1993–1995, 1180 etc. By that time, the Governor' s palace on the island was no longer in use. On changes in the function of its territories see chapter 4.2 in this volume and also NÉMETH 205/1–3.

4.5.1. Geographic conditions and the 1st century AD settlement structure

The natural borders of the Military Town were the Danube in the East and the Buda Hills in the West. During the four centuries of the Roman rule the current floodplain and Danube floods as well as continuous movements caused by erosion in the hills also played a role in changes in the structure of the town.

The first military unit brought to the territory of Óbuda was an *auxilia* (auxiliary troop). A *vicus* was established near the *castellum* (auxiliaris fort). In the *Flavian* Period (AD 69–96), several minor settlement centres formed beside each other.[72]

During the reign of *Vespasianus* (AD 69–79) the first *auxiliaris* fort was founded to South of the Árpád Bridge (*Figure 26*, NÉMETH 1990). Its building inscription dates to the year AD 73 and it was supposedly used till the end of the 2nd century AD.[73] No positive data exists on the network of roads in the *vicus militaris* surrounding the fort except from the area North of the *castellum*. What is known of its Southern extent is only hypothetical (KOVÁCS 1999/1, 145).

Part of the defences of the early, end of the 1st century AD *castellum* came to light, (SZIRMAI 1990, 684) in the Northern part of the later *canabae*, below the so-called Folyamőr Street–Búvár Street building complex. Likely there was an *auxiliaris vicus* in its vicinity as well (NÉMETH 1991–1992).

On the basis of the latest research, it may be reckoned with the existence of a contemporary, standard limitation system already in use when the first *castella* (MADARASSY 2003, 13) was established.

Early legionary fortress – the early canabae

The wars of Domitianus against Dacian-Sarmatian-Germanic tribes went together with a concentration of troops. Besides the *auxiliaris* troops, a legion was also commanded to go to Aquincum and the first legionary fortress with a palisade structure was built *(Figure 26).* Most probably this fortress lay nearer to the Danube than the 2nd–3rd century AD complex and most probably it was renovated several times (NÉMETH 1990, 1991–1992).

[72] On the military forts in more detail see chapter 4.4.

[73] TÓTH – VÉKONY 1970/1–2; KÉRDŐ – NÉMETH 1986, 1993, see also chapters 4.2 and 4.4.1.

Around 16–18 years passed between the establishment of the auxiliaris forts and the *vicus* and the palisaded fortress of the legion and its early *canabae* (NÉMETH 2003/1–2). The time span of the existence of the palisade period of the legionary fortress till it was re-built in stone was, more or less, similar. It is very difficult to decide whether certain early phenomena[74] should be associated with the *vicus* or the early *canabae.* The system of roads followed the microrelief of the coeval terrain, as did the orientation of the buildings, which also depended on the current relief conditions. Therefore, consequences may only be construed from changes in building orientation regarding changes in settlement structure locally. The single building period of military establishments (*castella auxiliaria, castra legionis)* within the settlement structure connected to them reflects a re-building interval that lasted for a long time, going from the centre towards the periphery of the settled area.

Buildings with different functions can already be found in the Northern part of the Military Town, in the location of the *castellum* and the *vicus* surrounding it in the first decade of the 2nd century AD. Early settlement phenomena observed in the centre (KABA 1955, WELLNER 1976/2, 1969, PARRAGI 1976/4, 1984, SZIRMAI 1984/1–2, NÉMETH 2004) came to light from levelling work following a later landscape rehabilitation. For the time being, the North-Western periphery is the least investigated part, and we lack sufficient data to reconstruct the settlement systems.

Continuous early settlement features could be observed over a larger area in the Southern part of the Military Town, along its North–South main road. The palisaded fortress built in the time of Vespasianus was later re-built in stone, and the *vicus*, established around it, was also built into the settlement structure of the Military Town – by *adductio* (compare KOVÁCS 1996–1997) *(Figure 30).*

Network of roads

For the time being, two North–South main roads from the 1st century AD *canabae* are known. One of them, running along the line of Magyar Lajos Street (today Kis Korona Street)–Fényes Adolf Street–Lajos Street (along this section it fell exactly in line with the *limes* road (*Figure 30.* a), can be connected with the establishment of the legionary fortress during the reign of Domitianus and it may also have been the main road of that fortress, the *via principalis* (PARRAGI 1976/1, MADARASSY 1999/2, 2000, 2002, 2003). The other road, West from the one mentioned above was found in Dévai Biró Mátyás Square (*Figure 30.* b, MADARASSY 2000). These roads are single-layer, gravelled roads with stone foundations, situated in the highest parts of the terrain, following contemporary. A 1st century AD East–West running dirt road also came to light (MADARASSY 1999/1, 2004) below the 3rd century AD road (*Figure 30.* d) running between the *limes* road (*Figure 30.* a) and the military amphitheatre (*Figure 30.* c).

Conduits running along the borders of lots along the *limes road* can be observed with increasing frequency. They represent the elements in that 1st century AD limitation system which later became part of the structure of the later town (MADARASSY 1999/3, *Picture 33).*

Lodgings

The early settlement had a rural character and the better part of the lots was not yet built over. Lodgings were located in the inner half of the lots. Three construction periods can be distinguished.

The first period can be characterized by the presence of subterranean long houses with a post or wattle structure in a single row of premises. The walls were built from clay bricks. The area of the houses is 2.5–3.5 x 10–15 m. Small subterranean structures with pole or post construction came to light, too, perhaps as out-buildings. They, too, were built of clay bricks. Their areas are is 1.5 x 2.5–3.5 m. Outside of the houses were storage pits, both smaller pits for cereals as well as larger storage pits.

Subterranean dwellings and out-buildings appear in the following period with houses also with a rectangular ground-plan depending on their function. These houses underwent several renovations and the buildings overlap each other (MADARASSY 1999/1, 2004).

In the third period, the semi-subterranean houses were replaced by a series of over-ground buildings with pole constructions. Only the bottom of the post-holes could be observed here and there, making it impossible to reconstruct the ground-plan of the buildings (MADARASSY 2004). The end of the rural character settlement

[74] This expression is preferred here because of the difficulties in pinpointing their chronology and function.

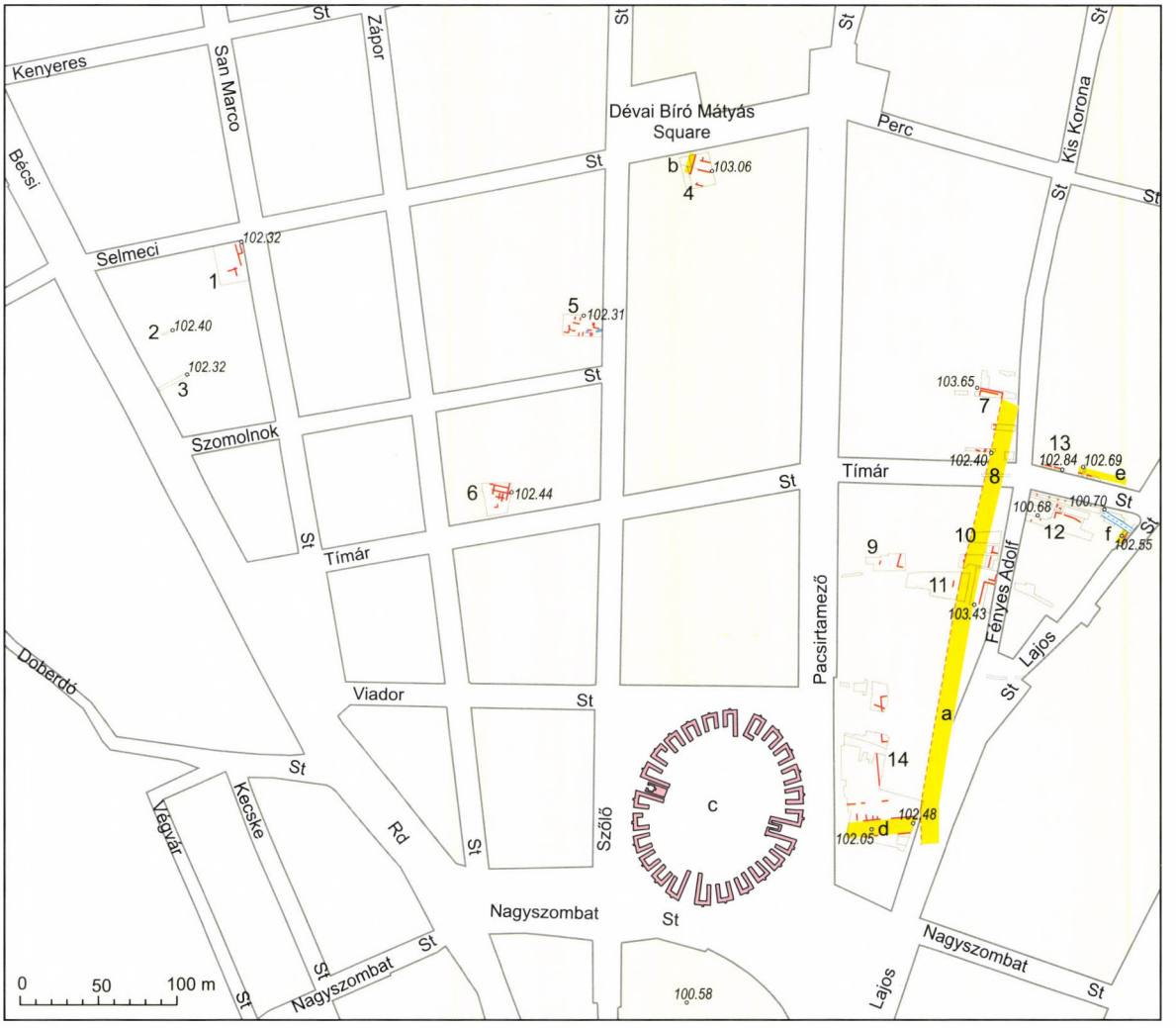


Fig. 30. Part of the Southern region of the Military Town with the military amphitheatre (Orsolya Madarassy – Anikó Kovács – Mrs. A. Vándor). – a = Limes road; b = road of N–S direction; c = Military amphitheatre; d = road of E–W direction; e = road of E–W direction; f = Drainage ditch; 1 = Selmeci Street 34; 2 = Bécsi Road 127; 3 = Bécsi Road 123; 4 = Dévai Biró M. Square; 5 = Szőlő Street 22; 6 = Timár Street 21; 7 = Corner of Timár Street and Fényes A. Street; 8 = Timár Street (roadway); 9. = Pacsirtamező Street 19; 10 = Fényes A. Street 6–8; 11 = Fényes A. Street 4; 12 = Lajos Street 118–120; 13 = Lajos Street 122; 14 = Pacsirtamező Street 3–11.

is marked by a levelling layer which can be dated to the beginning of the 2nd century AD (cf. NÉMETH 1991–1992).

The water supply

Dug wells *(Figure 6)* provided water for the settlement. Two types were observed, one was lined with a wooden barrel, the other, a later type, was re-inforced by a well-caisson made of stone. There seem to be fewer wells in the Western part of the town and more, on the flood-plain of the Danube, in the East. The wells remained in use till the middle of the 2nd century AD. Most probably they were used for watering.

By the Western edge of the town, the location of the early potters' settlement *(Figure 17)* was especially favourable because of the presence of Kiscellian clay and the karst springs flowing out of the hills. The industrial quarters extended as far as the hill slopes along Bécsi Road. They produced both household and ornamental pottery (L. NAGY 1942 627–629, PÓCZY 1956, PARRAGI 1971, 1976/2) while their brick kilns provided building material for 2nd century AD constructions (T. NAGY 1973, 117).

Picture 33. Border of a lot filled back with clay bricks from the Early Roman Period

4.5.2. *The 2nd century AD settlement structure*

After the military reforms of Traianus (AD 98–117) resulting in the construction of the permanent legionary fortresses in the provinces, the importance of *coloniae,* established earlier by *deductio,* decreased while that of the *canabae* near the fortresses increased (MÓCSY 1990, 65–67). When the territory of the *canabae* was marked out, the permanent living-space of the army garrisoned there was taken into consideration. Therefore, the area of the towns established in this way became a large multiple of the area of the earlier *coloniae* formed from *deductio.* (PÓCZY 1983, PÓCZY 1984/1.) The territory of the Military Town of Aquincum was separated from the legionary fortress by an approximately 40 m wide open space (PÓCZY 1983, NÉMETH 1976/1, 155).

Between AD 103 and 107, Traianus divided the far from homogeneous province into two parts. *Aquincum* became the public administration centre of *Pannonia Inferior* and the residence of the governor, of the *legatus Augusti.* The beginning of the contruction of the *canabae* in the central part, around the legionary fortress, dates to the first decade of the 2nd century AD.

The building up of the town was completed in AD 145, when the construction of the military amphitheatre was finished in the Southern part of the town (NÉMETH 2000/2 18, No. 30, PÓCZY 1983). The legionary fortress and the Military Town surrounding it was built in stone based on a standard central town-planning concept (HAJNÓCZI 1971).

The road network

The 2nd–3rd century AD legionary fortress was constructed West of the site of the previous one. While within the territory of the fortress the terrain had more or less been levelled before the rectilinear network of roads was established, the network of roads in the Military Town itself was determined first and foremost by terrain conditions (*Figures 16* and *17*).

As for the North–South main roads, the *limes* road was widened with covered stone channels running along both its sides. The Southern extension of the *via principalis* of the stone fortress had moved further to the West from its 1st century AD position (Mrs. BERTALAN 1973, 1976, PARRAGI 1973/1, MADARASSY 2000).

In the 2nd century AD, both the roads and the channels along the roads were systematically repaired as ground levels rose. Thus, by the middle of the 2nd century AD the level of the road had already grown 0.8–1.2 above the original level of the terrain.

In the North-Western quarter of the Military Town, the establishment of the road network was determined by the alternation of the North–South orientation of the fortress and the natural North-West–South-East direction of the Pilisvörösvári Valley. Accordingly, roads running North–South and North-West–South-East alternated with each other (PÓCZY 1983, MADARASSY 1995, 36).

In the Southern part of the Military Town, the East–West running road *(Figure 28.* 18) established following the stone-built fortress in the South ran farther West from the South-West corner of the fortress curving slightly South-West–North-East (MADARASSY 1996, 57). In the South-Western quarter of the *canabae,* the North–South orientation of the Roman Period buildings follows the relief meaning that the North–South roads did not run parallel to each other thus, the network of roads here could not be a rectangular one, either.

Public utilities

There was piped water in the town. Already in the South-Western part of the Military Town at the turn of the 1st and 2nd centuries AD, water from karst springs was used in the operation of the early potter's settlement (PARRAGI 1973/3, 1976/2, KIRCHHOF 2003) and to supply water to the Western part of the *canabae* though pipes that were most probably completed and modernized (PÓCZY 1983). Traces of an aqueduct were excavated (WELLNER 1973/1, PÓCZY 1983) on Vörösvári Road along what was then the main Roman road leading out from the *porta decumana* of the fortress. The *aquaeductus* of the Civil Town, extending to the Northern part of the Military Town (*Figure 17*) was built at the beginning of the 2nd century AD. In all likelihood it reached as far as the legionary fortress (PÓCZY 1983).[75] Sewage disposal was carried out with the aid of a network of covered channels running along the roads (NÉMETH 1976/1, PÓCZY 1983, MADARASSY 2000).

Public buildings

Public and private buildings alternated with each other within the territory of the *canabae*. Identification of the function of the public buildings is often uncertain because there are only a few buildings that have been fully or mostly excavated making it difficult to reconstruct their ground-plans.

The Governor's palace on Óbudai Island was built at that time.[76] The town quarter with the public administration buildings, public buildings of the governorship and the houses of high-ranking officials lay in the Northern zone of the *canabae*, on the Óbuda side of a branch of the Danube (PÓCZY 1983). The central cluster of buildings was most probably erected still in the first half of the 2nd century AD (WELLNER 1969, 1976/2, PARRAGI 1976/4, 1984, SZIRMAI 1984/1, 1984/2, KABA 1955, NÉMETH 2005/1) *(Figure 27).*

Dwelling houses

Only some main trends could be distinguished concerning the quarters of the town where people lived. More investigations are needed to reconstruct the system of *insulae* (blocks of houses). Those houses which opened into the main roads were larger, separate houses with a quadratic ground-plan. Their design was more sophisticated. And they were owned by richer families of higher rank. The relatives of the troops lived in single flats within blocks. These blocks were long houses reminiscent of barracks, built along side-roads. Within these houses there were two rows of rooms and a portico (*porticus*) (MADARASSY 1999/1). Along the main roads, houses had a larger area[77] and they were more lavishly decorated than the ones in the Western quarters of the town.[78] The dimensions of the areas are the same as those of the lodgings of the officers and the troops within the fortress (MADARASSY 1999/3).

The houses had stone foundations. The binder comprised a white, massive, limy mortar with pebbles. Vertical walls were made of fired clay bricks and by the main walls, reinforced by stone. Both the outer and the inner sides of the walls were plastered and decorated with wall-paintings. The rooms of a simpler design were whitewashed. The use of a soft, white limestone was characteristic of the material used for stone covers and besides the limestone, quartz frequently occurs in the binder of the walls.

Constructions in the second half of the 2nd century AD

During the construction boom following the Markomannic wars, the level of the roads was raised and they were covered by gravel mixed with mortar. Thus, the level of the road again rose 1.1–1.5 m above the original ground level. Divergences in the orientation of the walls suggest the application of a new limitation system both in the centre of the town and in the North-Western and South-Western quarters of the town.

Those buildings erected at the beginning of the 2nd century AD were renovated using a more modern technique and became more comfortable than before. The rooms received a terrazzo and stone flooring. Mortar with a higher sand content was used for the stone foundation of the walls while the walls themselves were made from fired clay brick. The buildings of richer owners were connected directly

[75] For the latest results on aqueducts see also footnote 72.
[76] For more details see chapter 5.4.1.
[77] PÓCZY for the latest results on aqueducts see also footnote 72.1955; PARRAGI 1991; FACSÁDY 1995, 1999/3; KÉRDŐ 1985; FACSÁDY 1976/2; NÉMETH 1976/1; PÓCZY 1984/2; MADARASSY 1991/3; MADARASSY – KÁRPÁTI 1998.
[78] MADARASSY 1999/3.

to the aqueduct and the channelling system. (MADARASSY 2000). When the channel was built, its path followed the North–South slope of the terrain (MADARASSY 2002).

The waters from intermittent water-courses were conducted into the western quarter of the town and their load extracted.[79] However, it seems that this activity was suspended during the Markomannic wars. Between the buildings erected at the beginning of the 2nd century AD, pulled down later and the re-built at the end of the 2nd century AD may be found the characteristic dump level from the potter's settlement. The kilns of the industrial area and other built features from the settlement came to light to its West (*Figure 17.*, MADARASSY – BUGÁN 1998, MADARASSY 2002, KIRCHHOF 2003) (*Picture 34*).

Picture 34. Erosion impact, dump level of the Western industrial quarters

4.5.3. The 3rd century AD settlement structure

Roads and buildings

As a result of the orders issued by Septimius Severus (AD 193–211) related to military politics, the Military Towns surrounding the fortresses were promoted to the status of *colonia*. In Aquincum, the *canabae* received the name and rank of *Colonia Aelia Septimia* together with the Civil Town. The legal ruling itself can still most probably be dated to the last decade of the 2nd century AD while the town-planning which followed probably already began at the beginning of the 3rd century AD when the *legio II. Adiutrix* returned to Aquincum.

The first large-scale construction phase took place in the first decade of the 3rd century AD, together with the renovation of the legionary fortress (NÉMETH 1997) and was completed according to centralized town-planning. Large-scale landscape rehabilitation and levelling may be observed everywhere in the town (PÓCZY 1983, T. NAGY 1973, MADARASSY 1998, MADARASSY 1999/2, MADARASSY 2000).

The level of the roads was raised again. The main roads were paved with stone slabs. The difference in grade from the original level of the terrain was 1.3–1.8 m (PÓCZY 1983, MADARASSY 1991/3, MADARASSY – KÁRPÁTI 1998). The side roads, too, were renovated (PÓCZY 1983, MADARASSY 1991/1, MADARASSY 2000). The *porticus* of the large, pillared buildings along the main roads were standardized (PARRAGI 1973/4, FACSÁDY 1976/2, NÉPMETH 1976/1, PÓCZY 1984/2, MADARASSY 1991/3, FACSÁDY 1995, HABLE 1997/1, MADARASSY – KÁRPÁTI 1998, FACSÁDY 1999/3, MADARASSY 2000) and a covered footway was formed beneath the *porticus*. The vertical parts of the main walls of the buildings were rebuilt in stone at this time, though the material of the dividing walls still remained fired clay bricks over a stone foundation. This period is characterized by the use of an *opus spicatum* walling technique with the application of yellowish, sandy mortar as the binding material.

In AD 214, Caracalla modified the boundary between the provinces of *Pannonia Superior and Inferior* and the political importance of Pannonia Inferior increased, making it a province governed by a *consularis*. The renovation of luxurious 3rd century AD buildings reflects the construction activities following the rise in rank. The building complex of the Governor's palace on Óbudai Island was extended and renovation was carried out on those parts which had been completed earlier (SZILÁGYI 1958, KABA 1958, PÓCZY 1958, KÉRDŐ 2003/1, 2008).[80]

[79] During the excavation of the western cemetery of the Military Town *(Figure 17)* the excavator found a 80 cm thick surrounding wall which followed the contemporary ground relief. Its damaged parts were levelled and repaired several times. At the same site, carved stones rolled down from the higher parts of the hill, came to light suggesting the presence of a quarry or a stonecutters' workshop somewhere above the Roman Period cemetery (FACSÁDY 2004, 22–23). O. Láng (LÁNG 2004, 93–94 and 98) had already observed traces of erosion or landslides (crushed walls, in-filling of a paved courtyard) at several points in the excavation outside the Military Town in the villa zone. (the editor).

[80] See chapter 5.4.1.

The buildings of the Military Town, too, were renovated. According to the latest investigations (NÉMETH 2005/1, 2008) the buildings can be classified into two groups in the Northern half of the Military Town based on their function and, at the same time, to their locations *(Figure 28).*

Within the zone along the Danube – East of the North–South running road which was at the same time the Eastern border of the legionary fortress and, more or less, along the line of present-day Sorompó Street – stood more public buildings (shrines, public baths, and supposedly administration buildings). In the neighbourhood, nine altar stones were found built secondarily into a 4th century AD Roman Period wall suggesting that an important sacred precinct had existed nearby. A rather high proportion of these altars were erected by governors and officers of high rank (NÉMETH 2005/1, 118, 2008, 313). On the Eastern side of Laktanya Street, parts of a high quality building with *terrazzo*-floors, floor-heating, frescoes and many stucco fragments were found. The building was rebuilt several times (KABA 1955) (*Figure 28.* 26). The remains of the building may either be part of a sacred precinct or an administration building (NÉMETH 2008, 319). To the South, segments of large baths were found on Kő Street (NÉMETH 1984, 2005/1, 2008) (*Figure 28.* 27, 29). In the last third of the century (after the abandonment of the palace on Óbudai Island) the residence of the Governor was moved into this quarter of the town.

North from this area, within a circa 150 m wide strip down the whole extent of the Military Town (in the West till the line of Bécsi Road/ Kunigunda Street and to the North till the line of Bogdáni Road), stood two luxurious dwellings, most probably the dwellings of the élite of the main town of the province (*Figure 28.* 19–25). It has not been possible to excavate either of them fully. Large and small bits of them were found on both sides of the already mentioned Roman Period road. The large quantity of stucco that came to light from the building excavated at 2 Sorompó Street (*Figure 28.* 25) suggests the decoration was quite rich (PARRAGI 1976/4, 1978). Under 14–16 Folyamőr Street (*Figure 28.* 23) parts of a repeatedly renovated building were excavated (PARRAGI 1976/4, 1978). Its walls were decorated with frescoes representing mythological scenes. The remains of another house with a rich decoration came to light (*Fig. 28.* 21, SZIRMAI 2008) West of this site, between Folyamőr and Búvár Streets. There were mosaic floors with geometric patterns and animal representations in its rooms along with wall-paintings with figural representations and plant motifs, as well as stucco. An area of 100 x 130 m has been excavated from this building with a *peristylium* revealing three courtyards, a bath-wing with four rooms and eighteen other rooms. Six of the rooms had a mosaic floor. Multi-layer wall paintings were preserved at several places till a height of nearly 1 m on the adobe walls with stone foundations (PARRAGI 1991, SZIRMAI 1998, 2000, MADARASSY 2003, 108–109) *(Pictures 35–38).*

South of this dwelling (*Figure 28.* 24), a series of rooms was found attached to a large hall ending in an apse. The hall also had a *terrazzo*-floor and a *hypocaustum.* Two important finds came to light from the site: one is a statue of *Fortuna* with clearly visible traces of its original red paint and the other find is a gilded

Picture 35. Bird's view of the excavation of the house with peristylium in the Military Town

Picture 36. Part of a mosaic with the depiction of a bull from the house with *peristylium*

Picture 37. Part of a mosaic with the depiction of a horse from the building of the Folyamőr Street

Picture 38. Well-preserved frescoes from one of the premises of the Folyamőr Street building with the representations of plant ornaments, veil and stork within oblong-shaped panels

marble head of *Juno* (SZIRMAI 1999, No. 7) This excavated building part was most probably the shrine of a larger building (WELLNER 1976/1).

The other road determining the structure of the Military Town began at the legionary fortress in a North-West–South-East direction and led across the town diagonally, continuing on as a long-distance road *(Figure 17).* Parts of buildings came to light on both sides of this road.[81] The best known building is the so-called Hercules villa which was richly decorated with mosaic floors, wall-paintings and stucco-work (*Figure 28.* 19*)*. This building has been excavated relatively completely. The emblem (central part) of the mosaic floor representing the myth of *Hercules and Deianeira* was an import from Alexandria. The villa was named after this mythological scene (WELLNER 1969, 1972, 1976/2, NÉMETH 2006/2).

A group of buildings can also be observed on the Southern side of the long distance road mentioned above (*Figure 28.* 20)[82] where *terrazzo*-floors and traces of floor-heating were also excavated (WELLNER 1972). Wall-painting with floral and wall-paper patterns as well as one with a representation of *Leda* were recorded at earlier excavations in the immediate vicinity of this site.[83]

In the North-Western part of the Military Town of Aquincum, shrines were excavated in addition to the remains of more richly designed buildings. Furthermore, altars, *votive* tables or representations of deities were also found on both sides of the North-West–South-East running road (PÓCZY 1983, 264). It will be necessary to carry our further investigations at these sites in order to decide whether these shrines were independent buildings or parts of a larger complex of buildings.

In the Southern part of the Military Town the construction of the central market-hall (PÓCZY 1983, 258–259, PARRAGI 1973/4) as well as the market-hall in the harbour area (*Figure 29.* 5, SZILÁGYI 1950, FACSÁDY 1976/2, 1977, 1980, KÉRDŐ 1982/1, PÓCZY 1976/1) can be connected to this construction period.

Public utilities

As for public utilities, it could be observed that canalization was most probably in private hands at that time. Together with the re-construction work on the houses, those sections of the canalization system in front of the house were modernized as well (MADARASSY 2000).[84] Public money saved in this way was allocated in all liklihood to the development of the aqueduct (WELLNER 1969). Bath buildings, bath wings appeared everywhere in the town in this period (SZILÁGYI 1943, KÉRDŐ – B. TÓTH 1981, PÓCZY 1977/1–2, NÉMETH 1984).

[81] On the Northern side of Meggyfa Street (WELLNER 1969), at the corner of Szél Street and Meggyfa Street (WELLNER 1976/2) and at 32 Szél Street (WELLNER 1973/2).

[82] On the corner of Szél Street and Szellő Street (WELLNER 1972).

[83] On the site with the Leda-fresco with earlier bibliography PÓCZY 1983, 265.

[84] Bp. III, 6–8 Fényes A. Street, see *Figure 30.* 10.

In the large dwelling houses and long houses in the central part of the town, the extent of the buildings oriented towards the central courtyard of the *insulae* (blocks of houses) could be dated to the first two decades of the 3rd century AD. These constructions were most probably already private ones. The dwellings were equipped with floor heating at that time and the houses were directly connected with the canalization system. Charcoal was certainly used as a fuel instead of wood in the kitchen hearths of that time. Earlier, wood had been used for this purpose while charcoal was used only in the central heating. As a result, kitchens with several types of ovens were usually placed in the inner parts of the houses where the courtyards were, that is, separated from the rooms (MADARASSY 2000, 2002). This period is characterized by the use of a very massive mortar with a high pebble content that made it possible to even add a storey to houses (HAJNÓCZI 1987, PÓCZY 1975, 1983, FACSÁDY 1980, MADARASSY 1998, MADARASSY – KÁRPÁTI 1998).

From the thirties of the 3rd century AD we practically do not find archaeological evidence of central city planning, private constructions were predominant in the town. During recent excavations, it could be observed in more and more points in the town that new dwelling-houses, independent from the original dwelling house, were being built behind the original one, in the inner part of the lots (MADARASSY 1999/3, 2000), while the extended parts of the original buildings quite frequently occupied 2nd century AD public places. The blocks of flats, too, were extended and modernized. In several places floor-heating was installed and new *praefurnia* were built (MADARASSY 2000, 2002). The walls and foundations of walls were built in a rather rough-and-ready way, cheaper building materials appeared comprising small limestone fragments and a yellowish, softer sandstone. Different walling techniques were employed such as the *opus spicatum* walling combined with the use of small ashlars and the *opus incertum* technique. Both walling techniques were used one beside the other. The use of a pink mortar with brick-dust perhaps dates to the Late Severan Period.

Later, from the forties of the century on, the mortars used for walling became ever more crumbly with an increasing sand content and binding material was not usually used at all for the foundations. At the same time, internal spaces became more decorated, the rooms had *terrazzo*-floors and, in most places, the wall-paintings were renovated (MADARASSY 1997, 2000, compare PÓCZY 1983, SZIRMAI 1984/4, 1991/3, PARRAGI 1984, 1991, WELLNER 1969, 1973/2, L. NAGY 1942, 353–385).

Archaeological evidence exists for the modernization of the heating system, from which it may be concluded that there was a rapid increase in the utilization of fuels. Maybe lumbering in nearby forests contributed to the increasing intensity of erosion in the second half of the 3rd century AD. On the Western edge of the town the traces of a large pole-constructed palisade system dated to the years AD 268–270 could be localized (MADARASSY 1997, 2000, 2003). Most probably this construction protected the area from erosional slip in the Buda Hills.

Within the period lasting from the 60s–70s of the 3rd century AD till the turn of the 3rd and 4th centuries AD, certain parts of the Military Town gradually became depopulated.

A large-scale landscape rehabilitation dates to this period during which buildings of entire *insulae* were pulled down (MADARASSY 1996, 2000, 2002, 2003). The Governor's palace, too, was vacated in the years AD 260–270. Researchers think that the use of the buildings of the Governor's office was continuous till the 60s of the 3rd century AD (WELLNER 1970, 1973/3). Around AD 270, the military amphitheatre (*Figure 30.* c) was altered, most probably for military purposes (T. NAGY 1973). It seems more and more probable that together with the reorganization of the troops taking place within the framework of the Late Roman Period military reforms, the territory was given up by central order and was systematically abandonned. At the turn of the 3rd–4th centuries AD Late Roman cemeteries may already be found by the Southern and Western margins of the Military Town, that is, by that time the periphery of town was already considered the outskirts (Ma NAGY 1993). Also, in the period between the abandonment of the western quarter of the town and the establishment of the cemeteries, marks left by erosion could be observed in this area. Late Roman Period graves were dug into the thick clay layer washed out from the hillside.[85]

[85] The publication of the Western cemetery of the Military Town: TOPÁL 1993, 2003. (The editor.)

4.5.4. Changes after the Roman Period

Following the conscious human activity in the Roman Period aimed at transformation of environment came to an end, the importance of natural forces increased. In the West of the territory, the effects of erosion became stronger. In several places, between the 4th century AD level and the bottom of the modern fill, a yellow clayey fill, virtually without finds could be attested. Intermittent water-courses rushing down from the hills had undercut the Western end walls of the buildings in the Western quarter of the town so much that they appear, even in optimal circumstances as a mere strip of ruins in excavations *(Figure 31, Picture 39).*

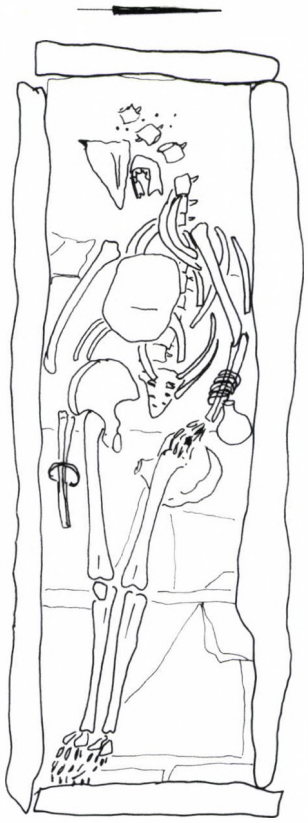


Fig. 31. Erosion impact after the Roman Period. Within an undisturbed tomb built of stone slabs erosion or groundwater might cause the displacement of bones (4th century AD)

In the inner part of the town, the movement of ground-water also caused changes. In those places where constructions had occurred over a territory already disturbed earlier, soil movements caused damage to the buildings. In some places floors sank. For example, in the Meggyfa Street villa building *(Figure 28.* 19), the mosaic floors collapsed into the heating flues below them. In the Southern part of the town around a sealed Roman Period well, the loose fill from the surrounding territory became a marshy environment – this phenomenon, too, can be explained by the movement of ground-waters.

4.6. The territories South of the Military Town (Budaújlak–Felhévíz)

The Southern quarter of Óbuda (Budapest, District III, Újlak) and the Eastern edge of Felhévíz (Budapest, District II), from Nagyszombat Street till Zsigmond Square represents an about 1 km long, gradually narrowing strip along the river bank. Its natural border in the East is the Danube, in the West the Buda Hills (Mátyás Hill, Kis-Kecske-Hill, Szemlő-Hill). In the investigated phase of the Roman Period (2nd–3rd centuries AD) it marked the Southern foreground of the Military Town (*canabae legionis*) and legally belonged to the *territorium* of Aquincum. Its ancient topography may be described as being divided into three large North–South oriented zones determined by the relief conditions (HABLE 2002, 275) *(Figure 32).*

Picture 39. Erosion impact after the Roman Period. Stripe of the ruins of the Western wing of a Roman Period building. (Western walls undercut by erosion.)

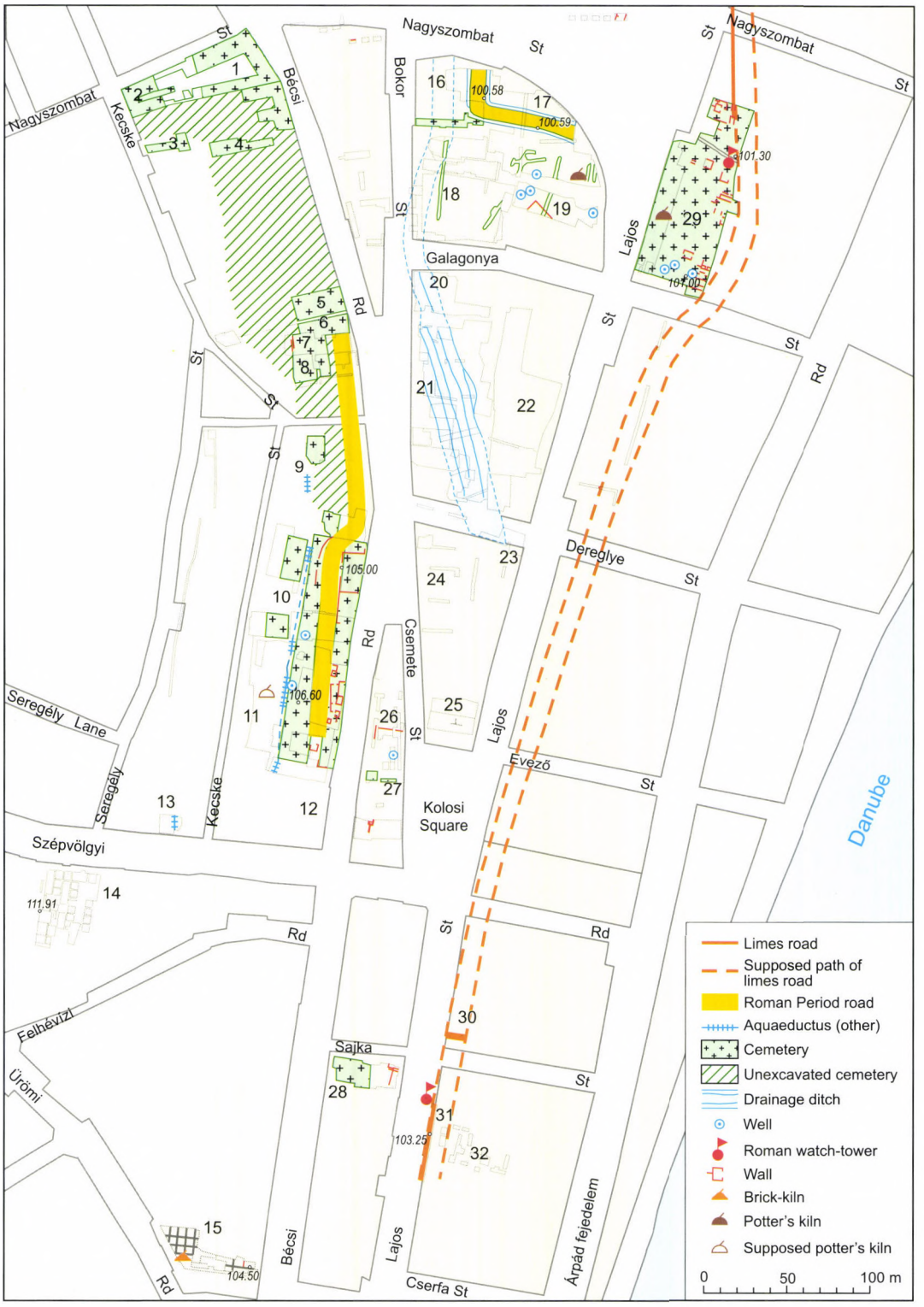


Fig. 32. The area South of the Military Town (Katalin H. Kérdő – Anikó Kovács – Mrs. A. Vándor after Tibor Hable). – 1 = Bécsi Road 82–86; 2 = Kecske Street 29; 3 = Kecske Street 24; 4. = Bécsi Road 80; 5 = Bécsi Road 66; 6 = Bécsi Road 64; 7 = Bécsi Road 62; 8 = Bécsi Road 60; 9 = Bécsi Road 54–56; 10 = Bécsi Road 45–62; 11 = Bécsi Road 38–44; 12 = Bécsi Road 34–36; 13 = Szépvölgyi Road 15; 14 = Szépvölgyi Road 18–22; 15 = Ürömi Road 11–Bécsi Road 12; 16 = Bokor Street 21–25; 17 = Corner of Lajos Street and Nagyszombat Street (Lajos Street 76–84); 18 = Bokor Street 9–19; 19 = Lajos Street 74; 20 = Bokor Street 1–5; 21 = Bécsi Road 63–71; 22 = Lajos Street 48–64; 23 = Lajos Street 46; 24 = Bécsi Road 57–61; 25 = Csemete Street 1; 26 = Csemete Street 2–6; 27 = Kolosy Square 4; 28 = Bécsi Road 25; 29 = Lajos Street 71–89; 30 = Lajos Street 35; 31 = Lajos Street 29–31; 32 = Lajos Street 23–31.

4.6.1. The Eastern slopes on the Western side of Bécsi Road

By now research have shown beyond doubt that Bécsi Road had a Roman Period origin, or to be more exact, it can be attested that below the modern road-way or within its narrower or wider vicinity there was a several times renovated Roman Period road running in the same direction towards *Solva* (Esztergom) and which was also used in the medieval period. (GARÁDY 1938, 185, HORLER 1962, 157, lately LÁNG 2003). In Budaújlak this continuity could only be shown indirectly (PÖLÖS 1994, 89, BERTIN 1996, 41 and *passim* and HABLE – MÁRTON 2000, 31). At the same time, over the 140 years which have passed since the first registration of finds (RÓMER 1863, 156) about 500 pieces of data on burials (excavated graves, isolated tombstone finds, sarcophagus) reflect the basic way the slopes along the Western side of the Bécsi Road were used in this period.. The earliest graves in the Western cemetery of the Military Town, (lying at an altitude of 102 and 105 m aA) were excavated in lots at 80–86 Bécsi Road and 25 and 29 Kecske Street (L. NAGY 1937, 273, T. NAGY 1943, 374, KABA 1964, 247 etc, TOPÁL 1996/2, 44 etc.). They date to the end of the 1st century – the beginning of the 2nd century AD. The graves were dug into the eroded side of Kis Kecske Hill, covered by limestone debris, or into the clayey terraces to the East of the piedmont. (HABLE – MÁRTON 2001, 22). The majority of graves which were cremation burials without urns (60%) and inhumation burials (40%) date to the beginning of the 2nd century AD (BÓNIS 1947, 44). Going southwards within the cemetery, the ratio of inhumation graves and, at the same time, early burials decreased considerably (down to 1 or 2%! BERTIN 1996, 40–42). The skeleton found on the rise – at the highest point known so far – (110.8 m aA) was most probably situated by the Western margin of the cemetery (7 Kecske Street, HABLE 1999/2, 132). On the flat terraces South from lots 60 and 62 Bécsi Road traces of a settlement of a native population that functioned at a time just prior to the cemetery occurred with increasing frequency (1st–2nd century AD buildings, pits, wells, kilns FACSÁDY 1999/1, 21, BERTIN 1999, 29 etc.). Late Roman Period industrial features were found such as. a lime-kiln re-using the limestone material from the cemetery (HABLE – MÁRTPON 2001, 24) or 3rd–4th century AD brick-kilns and stone buildings (11 Ürömi Street–12 Bécsi Road: FACSÁDY 1997/1, 14 etc.).

Small burial enclosures (with an area of 5 x 5 m and with angular or circular groundplan) or large enclosures (with an area of about 25 x 25 m) from the second half of the 2nd century AD were established on the Western side of Bécsi Road (MÁRITY 1993, 33, BERTIN 1997, 24, 1998, 44). Decorated grave steles with inscriptions were erected more often (HABLE – MÁRTON 2000, 24. etc., 2001, 29 and 36), the memorial places were decorated with statues (KUZSINSZKY 1908, 94, BERTIN 1999, 31) and the grave goods, too, became increasingly valuable (FACSÁDY 1999/1, 24).

Several side roads connected the cemetery with the path of Bécsi Road to make the approach to the cemetery lots easier, e.g. Budapest, District II, 4–6 Lajos Street, Cserfa Street–3 Bécsi Road (FACSÁDY 1996, 20), or 34–52 Bécsi Road. In the latter section, the 2nd century AD dirt road forked at lot No. 52 (at 103.4 m aA) and led to the South, parallel to Bécsi Road, along the Western, entrance side of the burial enclosures (at 104.2 m aA). At a distance of about 10–20 m West of the road a North–South running aqueduct meandered on the sloping hillside (at an average altitude between 105.5 and 106.6 m aA (BERTIN 1997, 21 etc.). This covered conduit with stone walls and clay pipes had already been found on several lots along Bécsi Road. Its path could be followed along a section of more than 1 km till the Farkastorki Road (TOPÁL 1996/2, 45). Its paved distributing shaft appears at lot No. 50 on Bécsi Road, while its Southern fork can be found under lot No. 54.[86] A short section of another aqueduct came to light beneath 15 Szépvölgyi Road (MÁRITY 1997, 36). At the moment, nothing is known about the continuation of the network of aqueducts South of Szépvölgyi Road *(Picture 40).*

The building inscription from a renovated bath (after AD 230) from the neighbourhood of Kolosy Square (CIL III 10489, RÓMER 1876, 39) suggest that collected spring water was used. According to excavation results, the aqueduct was destroyed in the middle of the 3rd century AD, while the road, which in the meantime had been given a gravelled surface cover (at 105 m aA) was used even in the second half of the 4th century AD (BERTIN 1999). In the second half of the 3rd century AD, burials became increasingly rare West of Bécsi Road. There were com-

[86] NÉMETH 1973, MÁRITY BTM DataBase 1820–97.

Picture 40. Ruins of an aqueduct at Budaújlak

pletely vacant, intact spaces here and there on the Western side of the aqueduct (at an altitude of 106 and 109 m aA). In the last (4th century AD) period this part of the cemetery is represented by a few sarcophagi made by putting together earlier (2nd century AD) tombstones as well as by one or two scattered cremation and inhumation burials (38–42, 44 Bécsi Road, BERTIN 1997, 24, 1998, HABLE – MÁRTON 2000, 24 etc.) that sporadically also occurred East of Bécsi Road (25 Bécsi Road, FACSÁDY 1999/1, 24, 4 Kolosy Square, HABLE 2000/1, 17).

There was a ditch under present-day Szépvölgyi Road that was clearly visible till the 18th century and in the middle of the 14th century, it was already a well-known and marked administrative border (*crepido vallis*, JANKOVICH 1963, 161). Some Early Roman ruined walls, a pit and the geological profile of the Szépvölgyi Road are known from the gently sloping Southern side of Szépvölgyi Road bordered by Ürömi Road–Felhévizi Road (FACSÁDY 1999/4). Parts of a large building with a counter-fort (*villa urbana)* and a shrine to *Iuppiter Teutanus* or a sacred precinct (PÓCZY 1999, 201 etc.) have come to light, from the the fifties of the last century, from the grounds under lots Nos. 39 and 42 on the Northern side of the road (FACSÁDY 1997/2 and 2002/2, 15 etc.). As far as we know, the so-called "Governor's villa" was built at the at the earliest at the end of the 2nd century AD. Its rooms were rebuilt twice and finally it was destroyed in the second half of the 3rd century AD.[87]

4.6.2. Flood plain lowlands in the strip between Bécsi Road and Lajos Streeet

This flood-plain, covered by a thin layer of silt deposited by Danube floods as well as by fine-grained load washed down from the hills, lies between former Roman Period main roads (Bécsi Road and Lajos Street) at an altitude of 101–102 m aA. However, South of Szépvölgyi Road the flood plain could hardly could be traced between the *limes* road and the cemetery lots situated in the piedmont area (HABLE 2002, 278). The administrative border of Budaújlak in the North is Nagyszombat Street. During the 2nd–3rd century AD the Military Town of Aquincum extended till the line of this street (T. NAGY 1962, 50). A more regulated townscape characteristic of a *canabae* never developed South of it *(Figure 33),* and even after the end of the 2nd century AD, *insulae* and stone buildings were only built along the *limes* road. The Southernmost block of houses that are known came to light at 89 Lajos Street (T. NAGY 1973, 117, HABLE 2003) *(Picture 41).*

The largest building in Aquincum, that is, the amphitheatre of the Military Town, was completed by AD 145 (KUZSINSZKY 1891, 81 etc., SZILÁGYI 1956). Before this time, during the reign of Hadrianus (AD 117–138) one of the potter's workshops in the neighbourhood which had operated from the rule of Domitianus (AD 81–96) (VÁMOS 2002, 22 skk) as well as several other industrial fetaures closed down (HABLE 1996, 33 skk, 2003). In the second half of the century, the former working pits, pottery kilns and, ditches had been filled with refuse. Of the 11 wells so far excavated in the territory, three were used beyond any doubt till the beginning

[87] T. NAGY 233. B. IV. Excavation documentation. Manuscript: MNM Central DataBase.

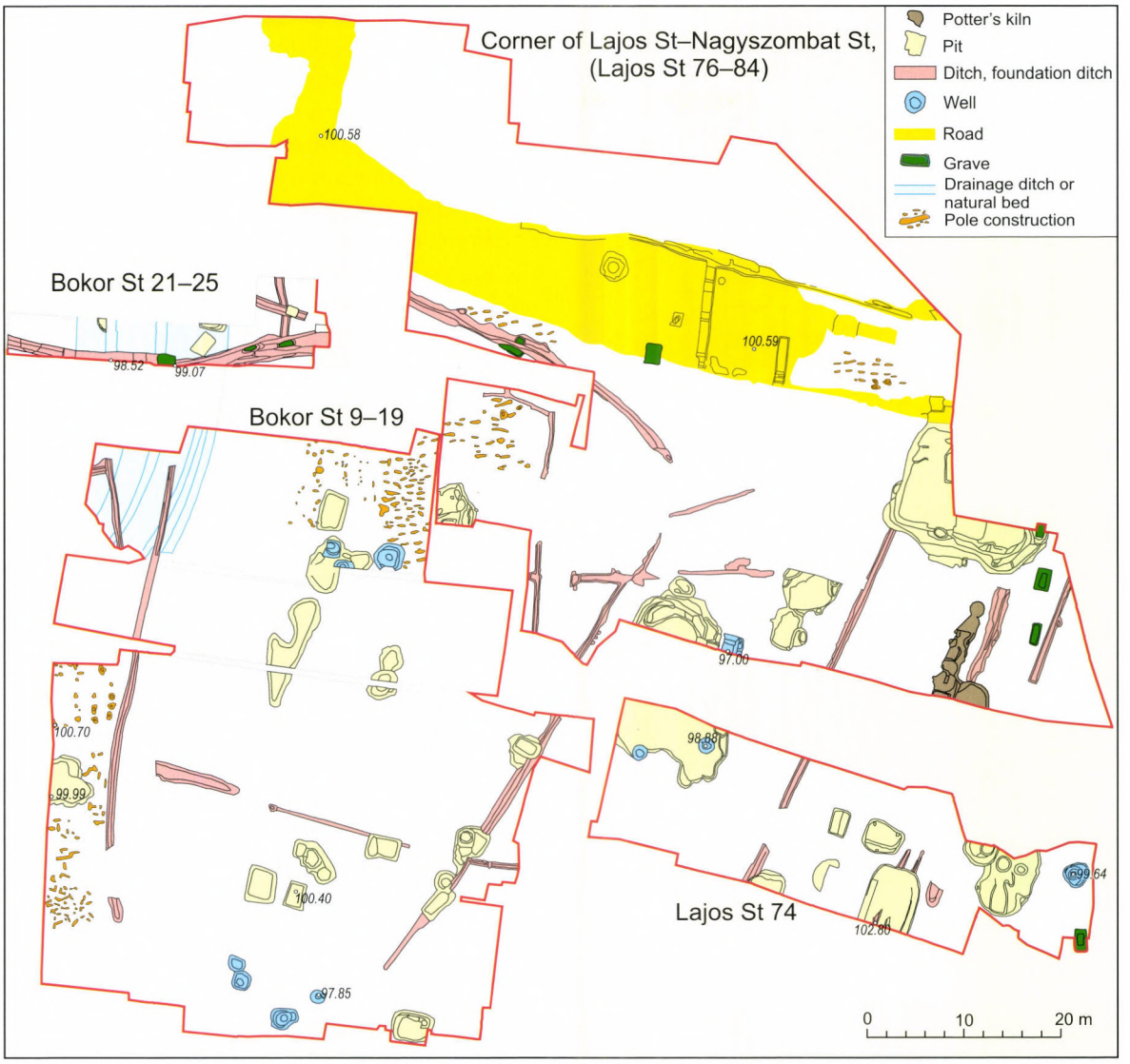


Fig. 33. Part of the area South of the Military Town (Tibor Hable – Anikó Kovács – Mrs. A. Vándor)

of the 3rd century AD. Within these shallow wells (their average depth was 3–3.5 m) we reached the former aquifer with gravel at an altitude of about 97–98 m aA (HABLE 2002/2, 42–44, 2003). The road leading into the South gate of the amphitheatre (at an altitude of 100.59 m aA) most probably existed even in the centuries of the Migration Period. There is also proof that the building itself was used until quite late (T. NAGY 1943, 374, GYÖRFFY 1955, 20). At the same time also graves appeared at the beginning of the 3rd century AD in the territory of the former potter's settlement, in the Southern environs of the road and the Eastern side of Lajos Street (HABLE 1996, 37 skk, 2000/1, 17 skk, 2003).

At present, it cannot be stated with complete certainty what the origin and fuction of that 20–25 m wide and 2 m deep bed in the middle (a Danube branch?) which cut through its environs along the North–South axis of the territory between Bécsi Road and Galagonya Street, and between Lajos Street and Dereglye Street (MÁRITY 1996/1, see also chapter 5.5.1.). On both banks of the bed, traces of contiguous, large bunches of post holes, mostly with an angular cross-section, formed the substructures of Roman Period granaries (*horrea*) or some other features. In some places, the series of poles were arranged into units in a, more or less, regular area of 20 x 40 m (HABLE 2002, 271) *(Pictures 42* and *43).*

Picture 41. Ruins of a Roman Period building from an excavation at Budaújlak

Picture 42. Roman Period well at Budaújlak

Picture 43. Remains of the road leading to the Southern gate of the amphitheatre of the Military Town

4.6.3. Strip along the river bank and the zone of the limes road on the Eastern side of Lajos Street

It has so far only been possible to observe the Danube bank and of the margins of the flood plain at a single place, that is, within the excavated block of 26–28 Árpád fejedelem Road and 5–7 Zsigmond Square. After the abandonment of an early (1st century AD) native settlement,the margins of the upper flood plain were strengthened by North–South walls and ditches. Later, the bank was protected by repeated levelling work. Based on the experience of the excavators: "on the one hand, the flood plain area inclined strongly to the East while, on the other hand, its surface was slightly structured in parallel with the Danube bed and sloping in a North-South. The layers on the Western side of the locality reflect the strong impact of erosion. Marks left by the activity of intermittent thermal waters were documented on the flood-plain of the Danube, in the immediate neighbourhood of the remains of excavated settlements (FACSÁDY – KÁRPÁTI 2001, 15 etc.).

Along this line, the *limes* road obviously lay on safer terrain, that is, on a more elevated surface, nearer to the hills and, thus, was protected against floods (under the path of the Lajos street). Sections of the road, bordered by traces of early settlements, watch-towers and Late Period graves in the North at several places on Lajos Street, e.g. at lot No. 35 (WELLNER 1963, 303 etc. and 1971/1, 411 etc.) and Nos. 23–31 (SZIRMAI 1991/2) have already been excavated. The 80 cm thick, 6 m wide roadway, which supposedly was built during the reign of Traianus (AD 98–117) and repaired several times during the 3rd century AD, could be traced along the Eastern edge of Lajos Street as far as Szépvölgyi Road. At that point its path veers away the modern road towards the North-East. At Galagonya Street it ran at least 50 m East of the edge of the modern pavement. Eventually the road reached the Southern edge of the *canabae* in the Eastern quarter of the lots at 85–89 Lajos Street, after a slight North-North-West curve of at an altitude of 102.7 m aA. After the great Germanic-Sarmatian wars (AD 155–179) at the latest, the wooden houses, industrial features and ditches along the road were cleared away and stone buildings with irregular ground-plans were erected on empty lots on the Western side of the road (MÁRITY 1989, 9 etc., 1992) in this latter section. A small watch-tower (with outer dimensions of 6 x 6 m) was built in the same area on lots at 83–85 Lajos Street at the time of the military reforms of Emperor Commodus (AD 180–192). A similar watch-tower came to light at 29–31 Lajos Street circa 550 m to the South (*Figure 32.* 29, 31) (WELLNER 1963, 303 etc.).

After the great catastrophe on the *limes* in the sixties of the 3rd century AD, the buildings in the suburb along the road fell out of further use and the territory was fully occupied by the cemetery that had long since expanded from the Western side of Lajos Street (HABLE 2003).

4.7. Enviromental aspects and the road network

There is a favourable place for crossing the Danube in the environs of Budapest where the river's bed widens and is ntersected by several islands. This North–South oriented water way is intersected here at several points by ancient East–West running trade routes (T. NAGY 1973, 41). For the time being, no positive data exists on other navigable water-courses other than the most important water-way, the Danube. The importance of trade related shipping on the Danube has already been mentioned by earlier researchers (L. NAGY 1942, 657). Although clear-cut archaeological evidence has not yet come to light, it seems likely that the Danube harbours on the main town of the province were in line with the legionary fortress (T. NAGY 1973, 117), on the Eastern side of the central building of the Governor's palace (KÉRDŐ 1997/3, 30–31) and within the Civil Town section of the Danube (*Figures 16* and *17*). Recently, faint traces of Roman Period fortification on the Danube bank. (FACSÁDY – KÁRPÁTI 2001) were found at the mouth of Szépvölgyi Ditch, South of the Military Town.

Archaeological evidence for the existence of permanent bridges over the river came to light at two points on the Aquincum Danube section. One was in the neighbourhood of present-day Árpád Bridge while the other led to the island and the left bank from the right bank, more or less, in line with the bridge on Mozaik Street (*Figure 21*). The remains of the pillars from the former bridge were surveyed in the 19th century by Gusztáv Zsigmondy, though the correct interpretation of the relation of these remains to the Roman Period topography of Aquincum became possible only after the identification of the exact place of the legionary fortress (NÉMETH 1999). The remains of a bridge with a foundation of wooden poles and a stone superstructure came to light (ZSIDI 1999/2) on the Northern margin of the Military Town, by the former mouth of the Aranyhegyi Stream. Based on dating of the wooden poles from the foundation of the wall of the bridge head, its first form was most probably built after the seventies of the 1st century AD[88]. Besides bridges making crossing the Danube easier, the bridging of minor water-courses, too, became necessary. The remains of one of the stone pillars belonging to a bridge of this kind which crossed the bed of the Aranyhegyi Stream were part of a road connecting the Civil Town and the Military Town (PÓCZY 1984/1, 20). Another North–South lattice structure of poles spanned the Rádl Ditch in the Early Roman Period (ZSIDI 2001/3, 60–61).

The mostly East–West running land roads connected the inner parts of the province with settlement units, while North–South routes connected parts of settlements situated along the Danube. During the Roman occupation, the land roads comprising the marching routes of the army were primarily built in the valleys of streams: along Solymári Valley, Pilisvörösvári Valley, Szépvölgy Valley, the Ördög Ditch along the path of today's Fehérvári Road by the foot of Gellért Hill, and within the so-called Rózsavölgy (KÉRDŐ 1997/1, 400–404). Later, the significance of these roads changed with some continuing to function as long distance trade routes.[89] The Aquincum–Brigetio Road[90] running through Solymári Valley, the shortest communication route between the two legionary fortresses, maintained its importance from a military point of view for a long time. According to Lajos Nagy, protecting this road was the reason for the building-up of defences, strengthened by towers, in the Aquincum Civil Town (L.NAGY 1942, 373).

The road which connected these military features ran along the right bank of the Danube in a more or less North–South direction (the *limes* road). Its path was recorded by researchers inseveral places (L. NAGY 1942, 380–382, SZILÁGYI 1968, 7; T. NAGY 1973, 118).[91] The limitation of the *limes* road within the town of Aquincum, which, in its first form, had to be constructed at the same time the permanent le-

[88] Here, we must express our thanks to András Grynaeus for dating of the wood material found at this site and also for dating several other wood building materials from Aquincum (LÁNG – GRYNAEUS 2005).

[89] FITZ 19901/1, PÓCZY 1998.

[90] GARÁDY 1938, L. NAGY 1942, 379, FITZ 1962, 76, 83–89.

[91] Reports on recent results of excavations: WELLNER 1971/1; PÓCZY 1984/1, 19; SZIRMAI 1991/2; FACSÁDY 1996; MADARASSY – KÁRPÁTI 1998.

gionary fortress was established in Aquincum (in AD 89), fundamentally influenced on construction of parts of the settlement lying outside the fortress. The first limitation, *limitatio*, at the settlement was supposedly carried out together with the permanent stationing of the legion or with the declaration that Aquincum was to be main town in the province (*Figure 22*, ZSIDI 1998/4, 92). As for the starting point of the *limitatio*,at present there are only suggestions, although from the topographic data it is obvious that the limitation conformed to the line of the Danube and also touched the left bank area. Later, minor modifications of the repeated limitations of the road system with, were carried out (e.g. under the *Severan* emperors, T. NAGY 1973, 118), also supposedly together with changes in the importance of certain sections of the roads (ZSIDI 1997/2). Here, the North-West–South-East oriented network of streets should be mentioned, starting from the *canabae* and continuing into the *territorium* of the settlement as well.

Aquincum marked the point where some roads leading into the Barbaricum began since it was so important from both strategic and commercial points of view (L. NAGY 1942, 380–382, MÓCSY 1962, 667). In recent years, the increased quantity of Roman Period finds coming to light in the Barbaricum as well as research carried out in Dacia have resulted in a reevaluation of the way the road section between Aquincum and Porolissum was used in the period after the Markomannic wars.[92]

4.8. The chain of defence features along the Danube and the fortifications on the Pest side

The military road along the Danube which served to protect the empire's frontier forked at Aquincum, along the Solymári Valley providing communication in the direction of *Brigetio*. To the North, the road ran parallel with the Danube from the legionary fortress into the Civil Town and further on to the fort at *Ulcisia Castra*. Communication with the left bank of the Danube took place at fords and there was also a bridge by the legionary fortress large buildings, so-called bridgeheads, were erected at the fords.

Because modern roads usually exist over the place of the *limes* road connecting the legionary fortress, these Roman roads remain barely accessible to archaeological investigation. Certainly, by the turn of the 1st and 2nd centuries AD, watch-towers stood along the road, which besides their contribution to the defence of the frontier, also served as beacons. The first watch-towers were built of wood and none is known in this territory. At present, 23 watch-towers are known on both banks of the Danube and from Margaret Island (*Figure 34*). The later watch-towers were constructed in stone but even the earliest ones date only to the second half of the 2nd century AD. An overwhelming number was built in the 4th century AD, mostly during the reign of Valentinianus, when it became increasingly necessary to strengthen the Pannonian frontier.[93]

[92] GABLER – VADAY 1986, Mi. NAGY 1997.

[93] The numbers from the following list are identical with the ones on *Figure 34*.

Watch-towers excavated within the territory of Budapest:

Watch-towers North of the legionary fortress:

Right bank watch-towers: ***1***. Csillaghegy near the Bivalyos village inn, Kossuth L. resort place 85, with a quadratic ground-plan, inner dimensions: 8.1 x 8.1 m from the age of Diocletianus or Valentinianus. **2.** Csillaghegy, Kossuth L. resort place 59 (Danube Boathouse) with a quadratic ground-plan, inner dimensions: 5.8 x 5.8 m, thickness of the walls: 1.1 m, from the age of Commodus. **3.** Kossuth L. resort place 21. (OKH resort house), its entrance is on its Southern side, with a quadratic ground-plan, inner dimensions: 7.0 x 6.9 m, thickness of wall: 1.1 m, that of the foundation wall: 1.4–1.5 m, from the age of Valentinianus. ***4.*** Aquincum, to the East of the Civil Town, within the territory of the Gas Factory, with a quadratic ground-plan, 7.0 x 7.0 m, and with 14.0 x 14.0 m surrounding walls, from the age of Valentinianus (compare *Figure 35*. 24). ***5.*** In the North-Western part of the Military Town, in the vicinity of the North-West–South-East running road, a building with dimensions of 2.9 x 2.9 m, the thickness of the foundation walls is 1.1 m. It is questionable, however, whether it was really a watch-tower? Its age is unknown.

Left bank watch-towers: ***6.*** Káposztásmegyer, to the South of the mouth of the Szilas Stream (Palotai Stream), opposite to the Bivalyos village inn, by the village inn of Káposztásmegyer. **7.** Újpest, beside the one-time Sas village inn (L. NAGY 1942, 759). A hypothetical bridge-head. ***8.*** Újpest, Nép Island, in the Southern neighbourhood of the Árpád Bridge. A hypothetical watch-tower.

Watch-towers between the Aquincum legionary fortress of and the Albertfalva fort: 9. Bp. III. 71–89 Lajos Street. Here, the ground-plan of a small watch-tower was documented by Erzsébet Márity and Tibor Hable. ***10.*** 29–31 Lajos Street. Watch-tower. Unexcavated, observed

The Romans considered boundary rivers like the Danube and a strip of several miles on their opposite banks as part of their territory.[94] The Romans built bridge-heads and watch-towers protecting fords and forts on the left bank of the Danube, opposite to the Aquincum section of the *limes*, which marked the frontier of the Roman Empire. These structures in case of need they were strengthened or re-built as required.

An illuminating representation of forts along the *limes*, which reckoned to a greater degree with Roman Period natural geographic conditions, was published by Lajos Nagy and János Schauschek.[95] They represented the Roman Period finds known at that time on a map made in 1764 which depicted hydrographic conditions before the river contol work on Danube River (HOLLÓ 1994, 16–17) (*Figure 35*).

The bridge-head of *Transaquincum* was excavated (*Figure 35.* 10) starting from the North, on the Pest side and South from the mouth of the Rákos Stream, at the beginning of the 19th century. Remains of a pillared portico and buildings were observed in the inner part of this fort over an area of 76 x 76 m. The bridge-head was built during the reign of Marcus Aurelius or the rule of Commodus and it was re-built in the second half of the 4th century AD during the reign of Valentinianus.[96] The fort defended the left bank part of the bridge with pillar foundations comprising wooden poles (*Figure 35.* 19),[97] surveyed by Gusztáv Zsigmondy, the engineer for the capital at that time.[98] A torso of a limestone statue of Victoria was scooped up from the Danube near the bridge-head.[99]

Some data is available on the Roman Period watch-towers that reinforced both Margaret Island and the Danube bank in Pest (*Figure 35.* 16–18 and 6–9).[100] Among other objects, a marble head of Hygieia and a bronze mask came to light from the sands of the Danube on the left bank of the Danube by the foundation of the Parliament (*Figure 35.* 7, HEKLER 1908).

The fort of *Contra Aquincum*[101] (*Figure 35.* 1) is situated in the Northern neighbourhood of Erzsébet Bridge.[102] The garrison troops in this building controlled and protected those most important trade routes which led into Sarmatian territory s and the lands of other Barbarian tribes

only during a rescue excavation. ***11.*** Bp. III. 8 Árpád fejedelem Road. By the springs of the Császár Bath, suggested by building remains and stamped bricks dated to the age of Valentinianus. ***12.*** Bp. II. Csalogány Street. Part of a building excavated here was identified as a watch-tower, however, recent research has not verified this identification (compare *Figure 35.* 15). ***13.*** Bp. I. 15–17 and 22–24 Lánchid Street (compare *Figure 35.* 14). Suggested on the basis of Late Roman Period bricks and traces of buildings from the age of Valentinianus. ***14.*** Bp. I. Tabán, Attila Road, by the mouth of the Ördög Ditch, (compare *Figure 35.* 13), 10 x 15 m, 2.85 m thick wall with a pole structure foundation, from the age of Valentinianus. ***15.*** Bp. I. Rudas Baths, hypothetical watch-tower. ***16.*** Bp. XI. Gellért Square (compare *Figure 35.*11), in the courtyard of the Gellért Spa, Late Roman Period walls, stamped bricks. ***17.*** In the territory of Nádorkert, ***18.*** Bp. XI. 109 Budafoki Road (In the literature there are two other features along this section which can be conditionally identified as watch-towers although their function is highly uncertain. One of them is at 26 Lajos Street–4 Sajka Street–25 Bécsi Road (FACSÁDY Ásjel. RégFüz. I/47. 1996. 35, No 49/8) while the other was found at Cserfa Street–1–3 Bécsi Road–2–4 Lajos Street (FACSÁDY 1996).

Margaret Island: ***19.*** At the Northern end of the island (compare *Figure 35.* 18), the circular tower which came to light in the area of the Medieval archiepiscopal castle was supposedly a watch-tower. ***20.*** Beside the Nagyszálló (Hotel Palatinus) (by the Medieval hospital of the Knights of St. John), Gusztáv Zsigmondy surveyed a bridge head of the so-called Verőce type (compare *Figure 35.* 16–17).

Left bank watch-towers: ***21.*** Kossuth Square, during the foundation of the Parliament (compare *Figure 35.* 7). ***22.*** Roosevelt Square (compare *Figure 35.* 6), Pest bridge-head of the Chain Bridge (Lánchíd) (below the Medieval building). ***23.*** Southern side of Boráros Square (compare *Figure 35.* 5. hypothetical watch-tower).

[94] VISY 2000 115, note 20.

[95] L. NAGY 1946, Picture 71.

[96] VISY 2000, 58, note 370, Mi. NAGY 1999, recently NÉMETH 2003/3, 97 etc.

[97] The serial number of the bridge (19) was omitted from the map mentioned above (L. NAGY 1946, 71). It is only found in the enumeration. (the editor)

[98] L. NAGY 1943, 761, MÉMETH 1999, 2000/1.

[99] L. NAGY 1942, 748. On other stone monuments see T. NAGY 1950.

[100] Here, it should be mentioned that on *Figure 35.* under No. 16. according to the legend it is not a Roman Period ruin which is represented but the hospital of the Knights of St. John which "stood at the place of the Roman period fort". The two Roman Period watch-towers at the mouth of the "*magnum fossatum*" are represented only on the map of Lajos Nagy cited above (*Figure 35.* 8 and 9.(the editor).

[101] On the name and chronology of *Contra Aquincum* see MRÁV 1992–1995, KOVÁCS 2001/2, recently see NÉMETH 2003/3, 98–99, 2003/4.

[102] L. NAGY 1934, 1942, Mrs. BERTALAN 1945, L. NAGY 1946, GEREVICH 1976, MELIS 1976, SZIRMAI 1976/2, 2003/1. On the forts on the Pest side recently see NÉMETH 2003/3, 96–99, 2003/4.

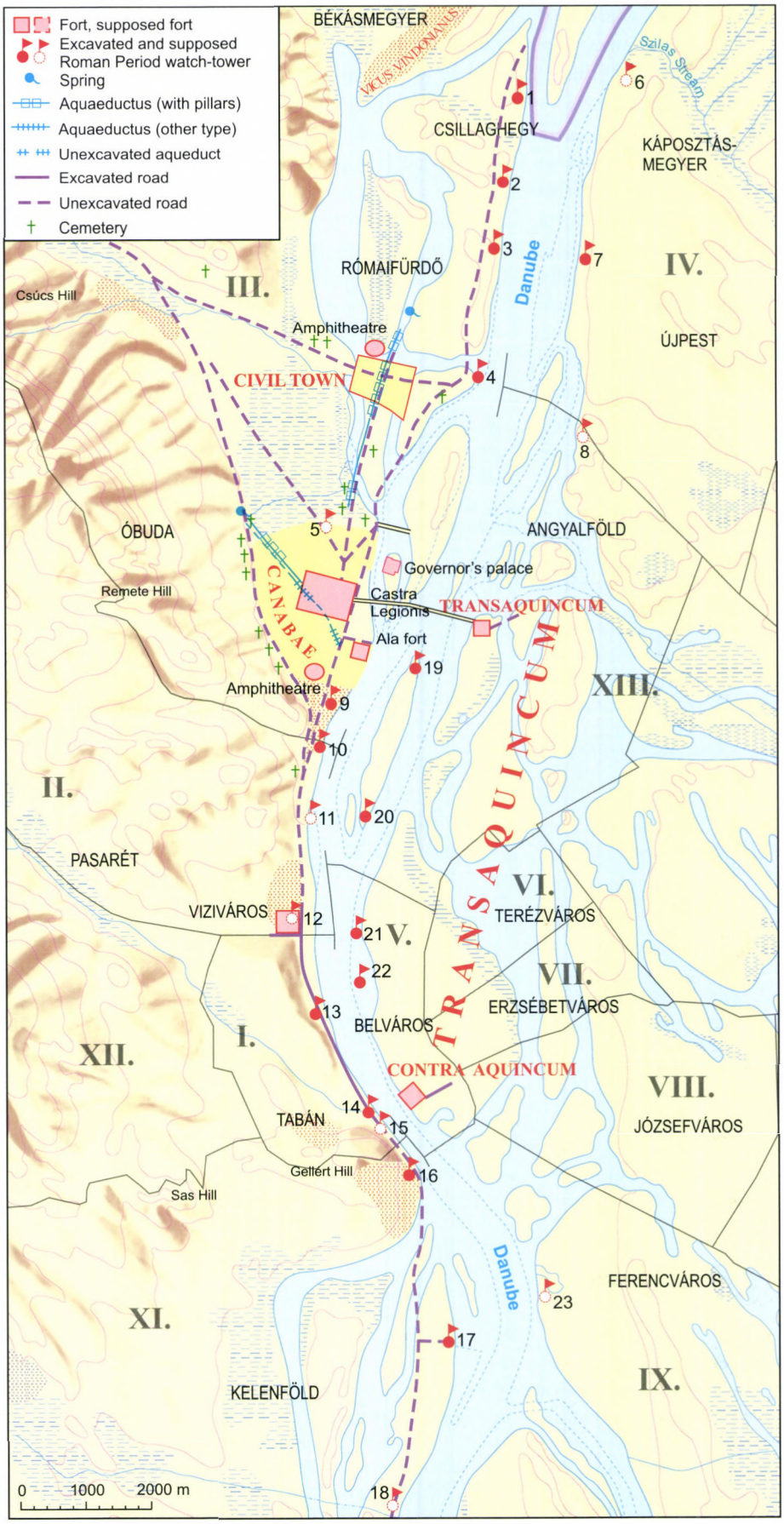


Fig. 34. The whole *limes* section at Aquincum with the chain of Roman Period defence features (after the supplement of FORSCHUNGEN 2003, by Katalin H. Kérdő – István Asztalos – Anikó Kovács). – Watch-towers, supposed watch-towers: 1 = Kossuth L. resort place 85; 2 = Kossuth L. resort place 59; 3 = Kossuth L. resort place 21; 4 = Homokos dűlő, area of the Gas Factory at Óbuda; 5 = Berend Street in the northwestern part of the military town; 6 = Mouth of Szilas Stream; 7 = „At the Megyeri country inn"; 8 = Nép Island, in the vicinity of the Árpád Road; 9 = Lajos Street 71–89; 10 = Lajos Street 29–31; 11 = Árpád fejedelem Road 8 (Császár Bath); 12 = Csalogány Street 26; 13 = Lánchíd Street 15–17; 14 = Tabán, Attila Road (at the mouth of Ördög Ditch); 15 = Rudas Bath; 16 = Gellért Square; 17 = „Nádorkert"; 18 = Budafoki Road 109; 19 = Margaret Island, at its northern tip, in the area of the Medieval archiepiscopal castle; 20 = Margaret Island, fort, at the Medieval hospital of the Knights of St. John; 21 = Kossuth Square 1–3 (in the place of the Parliament); 22 = Roosevelt Square – now Széchenyi Square (Lánchíd/Chain Bridge, Pest bridgehead); 23 = Southern vicinity of Boráros Square, the so-called Pusztatemplom of Ferencváros

in the Danube–Tisza interfluve area. The road leading from the fortress followed the path of former Kerepesi Road, (presently called Kossuth Lajos Street and Rákóczi Road). This road passed by the so-called *fossatum magnum* where a bridge with a permanent guard of Roman soldiers and therefore probably also a small watch-tower was erected. It later became an important passage-way in place of the later *Portus Kerepes (Figure 35.* 5), at the point where Barbarians formerly exchanged goods with Romans (*Picture 44).*

Picture 44. Contra Aquincum. Part of the Northern wall and one of its towers from the North-East

The Late Roman Period fortress was diamond-shaped with dimensions of 84 x 86 m. Its 3.5 m wide wall was reinforced with eight angular horseshoe-shaped towers with the inner measurements of 3 x 4 m. In the 4th century AD, the corner towers were transformed into fan-shaped ones. Under Valentinianus (AD 364–375), the internal buildings of the fortress were also renovated. The *cella trichora* was built over the shrine of the fortress according to research carried out by László Gerevich in the South-Eastern part of the fortress. Later, the *cella trichora* was included to the construction of a Protoromanesque church.[103] Based on brick stamps, the first stone fort was erected here in the middle of the 2nd century AD or at the end of it, while the later fortress was most probably erected in the period of the *tetrarchy* or during the reign of Constantinus (VISY 2000 58).[104]

Wall remains (from the baths etc.), a head of a statue of Marcus Aurelius, coins, and brick stamps refer to earlier features established in the place of *Contra Aquincum.* A helmet, now in the collection of the Hungarian National Museum, is among the more significant Late Roman Period finds. This ornamental helmet was made of iron covered with gilded silver plates and decorated with glass imitations of semi-precious stones.[105]

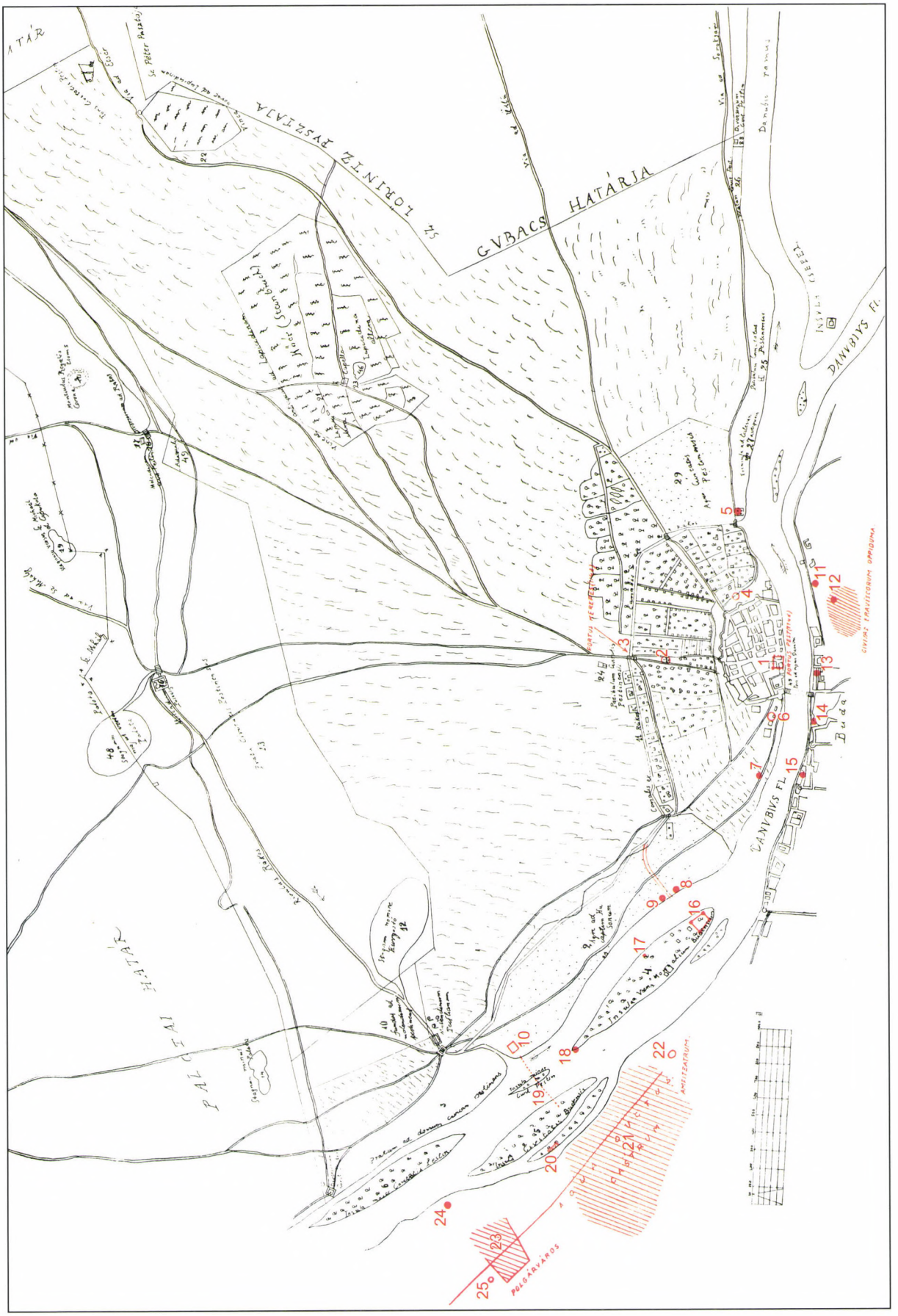
At the end of the 4th century AD and the beginning of the 5th century AD, the Roman garrison troops were withdrawn from the fortress which was left to decay although the Medieval town of Pest developed around it.

Remains of buildings and a hoard of Late Roman Period coins came to light on the left bank of the Danube, at the corner of Lónyai Street and Csillag Street in Budapest's District XI (*Figure 35.* 4). There is a hypothesis that there was a fort on present-day Boráros Square at the Northern end of Soroksár Road (*Figure 35.* 5) over which the church of Medieval Szentfalva was thought to be erected (L. NAGY 1946, 8). This is the point where the spillstream of the Danube flowed into the Danube.

[103] GEREVICH 1976.

[104] Stone monuments and other Roman Period finds came to light in the area of the inner town and not only from Március 15 Square (former Eskü Square), but also for example. from Curia Street, Petőfi Sándor Street, etc.

[105] Augustus –Attila, 33, Kat. No 230.


ÁTÁR
GVBACS HATÁRJA
DANVBIVS FL
Budae
CANVBIVS FL
POLGÁRVÁROS
AMPHITEATRVM

←

Fig. 35. The Wazpaur's map from 1764, completed by monuments from the Roman Period (after János Schauschek and Lajos Nagy, compiled by Anikó Kovács). –1 = The Roman Period fortress in the inner part of Pest (Portus Pest on a document from the year 1148); 2 = The Rókus Chapel in Pest was built in 1711 over the ruins of a Medieval settlement; 3 = Portus Kerepes, denominated on a document from 1148, the place of a supposed Roman Period watch-tower beside the magnum fossatum; 4 = Building remains in Csillag Street and the place of a hoard of Late Roman Period coins; 5 = The so-called Pusztatemplom of Ferencváros, Medieval Szentfalva in the place of a Roman Period fort; 6 = Medieval Új-Bécs in the place of the remains of a Roman Period watch-tower, the supporting building of King Sigismund's chains closing the Danube, the place of modern time Sóház (salt-depot) and of the Chapel of St. John; 7 = The place of Roman finds which came to light during the construction of the Parliament, supposed watch-tower; 8–9 = Watch-towers protecting the Pest fortress (see No 1) from the North at the mouth of the magnum fossatum; 10 = Roman fortress at the mouth of the Rákos Stream; 11 = The place of the watch-tower which came to light at the construction of Hotel Gellért; 12 = Watch-tower on the Gellért Hill, 13 = Watch-tower in the Tabán; 14 = Watch-tower, Lánchíd Street 22l–24; 15 = A watch-tower at the corner of Csalogány Street with a Roman Period road leading westwards, 16 = Margaret Island, the hospital of the Knights of St. John in the place of a Roman fort; 17 = Watch-tower at the Medieval ruins; 18 = Circular watch-tower in the place of the archiepiscopal castle; 19 = Remains of a Roman Period bridge which led out from the legionary fortress and ran across the Fürdő Island to the fortress at the Rákos Stream; 20 = Governor's palace; 21 = Area of the legionary fortress and of the Military Town; 22 = Military amphitheatre; 23 = The Civil Town of Aquincum; 24 = Watch-tower in the area of the Gas Factory at Óbuda; 25 = Amphitheatre of the Civil Town

5. Ancient surface types observed during archeological excavations

5.1. Traces of Roman Period embankment and the former Danube bank in the territory of the Gas Factory

The importance of research carried put on the Danube Bank over a large area next to the Gas Factory is only increased by the fact that although several extremely important archaeological finds and features are known from the territory of the Gas Factory – which covers an area of several thousands hectars –, detailed excavations have not been carried out to date over larger surfaces (*Figure 19, Picture 10*). Following earlier observations rescue and test excavations, there was an opportunity recently to acquire more precise data on the building-over and use of the territory. The importance of the excavation was also emphasized by the nearness of the present-day Danube bank (ZSIDI 1991/1).

First of all, a modern slaggy rubble layer connected to operations at the Gas Factory was removed from the, more or less, 80 x 80 m area which was. The strip of concrete foundation from a modern crane track cut the area into several parts. In the larger part situated towards the East, by the side of the Danube, there was a sandy soil below the modern slaggy layers. West of it was found a more clayey surface with stones. The terrain sloped sharply upwards towards the West, and while in its South-Eastern part by the Danube the modern fill and historical layers covered the yellow, sandy subsoil in a thickness of 2–3 m, this cover was barely 1 m thick towards the West (*Pictures 45* and *46*).

In that part of the territory nearer the Danube, especially in the North-Eastern strip, contours of large features of varying shapes, cutting across each other but forming a system, even appeared during scraping work following the work of earth-moving machines. Based on the profile, former digging levels from the spots were not preserved anywhere. Thus, for every feature, those parts found below this level belonged to structures of the features which were not visible when they were in use. This presented a special difficulty regarding interpretation and identification of the feature(s). Another difficulty was the very small quantity of finds

Picture 45. The line of the river bank with a steep Eastward inclination is clearly visible in the Southern profile of the foundation ditch of the modern building "C" of Graphisoft Park, Óbuda)

Picture 46. Segment of the river bank with a steep sloping in a profile in the area of the former Gas Factory at Óbuda

which hindered connecting feates to particular periods. These two obstructive factors usually go together. At the same time, it was possible successfully identify a system of modern pits, supposedly from the period preceding construction of the Gas Factory. These oblong pits were most probably ice-cellars.

The ice-cellars, supposedly date to the 19th century and had cut through an earlier system of spots with vaguely defined outlines (*Figure 19*). The Western margin of this system came to light along a section of 25–30 m and its could be followed along a section of about 80 m. This system consisted of irregularly-shaped light and dark brown spots of different dimensions and strips connecting the spots with each other (*Picture 10*).

Because of modern disturbances and the previous destruction it proved barely possible to recognize a regular system on the basis of the spots. The Western margin of the territory was not disturbed by modern activity. In this area a planum method was used over the surface to excavate the spots of the large bunches of poles. Aa few test trenches were also dug in order to intersect the longitudinal profile. The remains of a large, renovated construction took shape within the profiles and the huge pits found during excavation of the surfaces. It was partly cleared away and filled back and partly destroyed naturally during a Danube flood vent. The construction lies at about 50–80 m from the present line of the Danube and it is oriented to the line of the river. In two of the profiles established during the excavation the former Danube bed with sand and gravel as well as the edge of the bank could be documented (*Picture 47*).

The places of three large bunches of poles, situated at the edge of the above-mentioned construction, were also excavated. Their diameter was about 180 cm and their relative depth was about 170–200 cm. They are funnel-shaped and at their centre they end in an oblong 20 x 30 cm dark brown spot. The postholes had a homogeneous fill, which, pedological investigations tell us was a sandy soil and did not contain humus. In some places there were a few pebbles and pebbles with mortar mixed in this soil. There were other characteristic structural elements in those profiles. The poles used to create the pole bunches were not driven into the ground vertically, side by side, but rather a vertical pole was supported by other, obliquely placed, poles surrounding it. Pole constructions of this kind are generally known from the Roman Period. In the profiles, marks of renovation were observed in several places, which, on the basis of the profiles, were probably connected with the construction's Eastward shift.

The results of the excavation were complemented with a geophysical survey (carried out by Sándor Puszta). The geophysics demonstrated the existence of a system which, although it appeared rather faintly, presented itself as a system with definite regularity. The extent and orientation of this system we found were the same as those found in the excavated construction.

West of the linear, pole construction feature, a several meters deep depression filled with silt and Roman Period pottery fragments was found. North of this, the lower-lying area was filled with yellow clay and small carved stone fragments which most probably came from the nearby Roman Period cemetery which was destroyed in modern times. Within the clayey fill there were scattered human bone fragments, fragments of a ceramic vessel that belonged together, mixed with modern material. In the Southern part of this area, most probably originally on a raised "sand bank", the foundation ditches of a timber construction building (?) were found (*Figure 19*). The orientation of the long, parallel ditches, is identical to that of the pole construction structure. Unfortunately, however, in this part the territory as well, the ground level was much lower below the former floor-level, so that there were no finds that could be dated here. Based on superposition phenom-

Picture 47. Section of a pile construction and its trace on a surface in the stripe of the Roman Period embankment in the area of the former Gas Factory at Óbuda

Picture 48. Layers sloping steeply Eastwards from the stripe of the Roman Period embankment, with layers deposited by floods (in the area of the former Gas Factory at Óbuda)

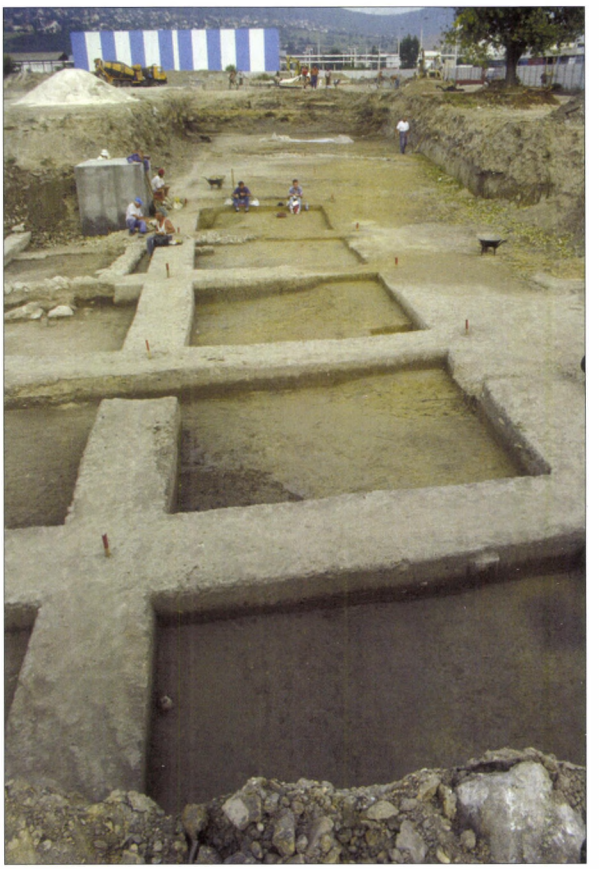
ena and the small number of finds (a Gallienus coin) both the pole construction and the building with timber structure could be connected to the Roman Period.

The identification of the construction is impeded by the fact that unfortunately here, too, it was not the remains of the construction itself that were preserved but only its traces. At the same time, considering the elements of the structure, its place on the bank of the river, as well as the nearness and the topography of the Aquincum Civil Town,it is reasonable to suppose that the place of part of a Roman Period quay construction has been found here. The strengthening of the bank in the Roman Period was important both from the viewpoint of flood protection and berthing (*Picture 48*).

5.2. Remains left by ancient spring activity in the territory of the Szőlőkert Street villa estate

The remains of the Szőlőkert Street villa estate came to light on a flat territory West of the Civil Town *(Figure 16)*.[106] Modern levelling and flattening resulted in the area being filled up, changing the characteristic relief formations of the original surface almost completely. However, during excavations the former geographical environment and its characteristics could also be observed (ZSIDI 1999/3).

The excavated area of the villa was covered by an about 180–200 cm thick modern rubble fill that took place continuously on the area from the seventies of the last century onwards. Below this layer was a greyish layer with humus, with an average thickness of 60 cm. The thickness of this layer was not the same everywhere so that it was thinner in the Northern part of the territory and thicker in the Southern part, suggesting that originally the Northern part lay somewhat higher than its immediate surroundings. Roman Period culture layers followed this relief. The remains of several phases of a period lasting about 300–350 years survived in a circa 40–50 cm thick layer, usually making their separation a very difficult task. Most of the features from the earliest period already cut into the subsoil. The subsoil was yellowish, sandy, and light grey clayey in small spots, sloping strongly to the South-East. Former spring activity (*Figure 25*) resulted in the formation of a yellowish white precipitation which preserved the ridges caused by the radially uprushing waters (*Picture 11*) was observed in the North-Western part of the territory in the sandy subsoil according to expert geological opinion. It was probably the water output from this spring – located South-West from the excavated area (*Figure 25*) – that was channelled into what had originally been a natural ditch running along the bottom of the elevated part of the area and which had been used for drainage even in the Roman Period. Also, the three wells (*Figure 25*) which came to light within a relatively small area suggest that the territory might have been rich in subterranean waters. Supposedly, the nearness of the spring meant that coins found in the territory were very badly preserved and because of their highly corroded condition it has been impossible to identify about one-third of them (*Picture 49*).



Picture 49. Photo taken during the excavation of the Szőlőkert Street villa estate. A steep Southward sloping of the Roman Period surface below the present horizontal terrain is clearly discernible

[106] Bp. III. 6. Szőlőkert Street.

The character of the excavated features as well as the soil layer sloping strongly to the South-East suggest that what has been discovered was the edge of a group of buildings belonging to a villa estate. Its central buildings may be situated higher up to the North. This corresponds to a research result demonstrating that although a certain part of the flat territory between the Civil Town and the Buda Hills was a lower-lying, damp area, its more elevated parts were suitable for settlement and thus, they were really used for this purpose.

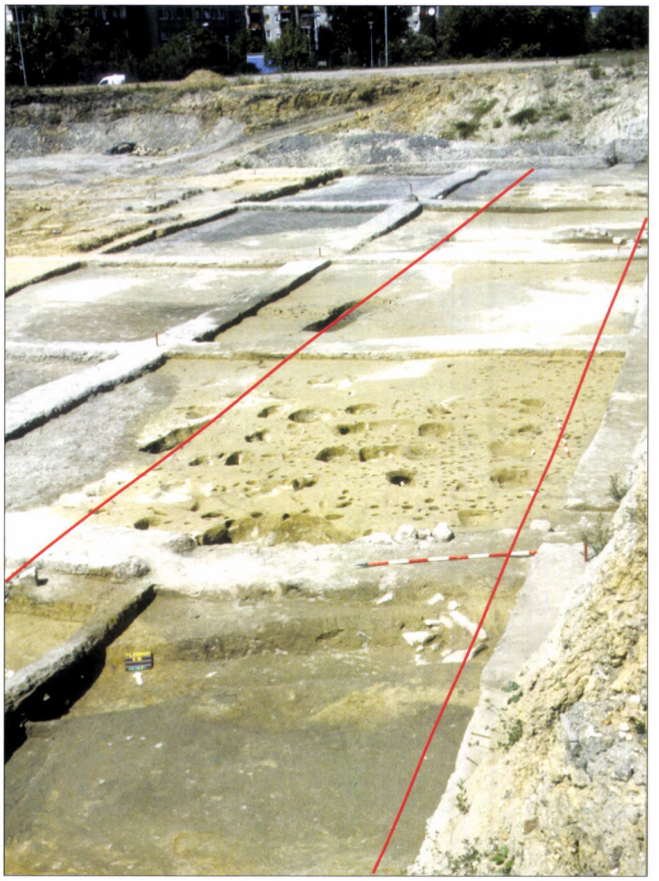
5.3. Traces of the Rádl Ditch and the Aranyhegyi Stream in the Military Town

Those excavations carried out in the territory of present-day Filatorigát, intermittently between 1978 and 2000, yielded new results, not only regarding the historical topography of the territory, but also furnished data on the natural water-course of the former Rádl Ditch and its "catchment area". During the excavations already shown on *Figure 21*, the former winding bed of the ditch came to light, filled down to a considerable depth with rubble from the brick factory and slag. The probable time the ditch was filled was the construction of the Filatorigát, because on 19th century maps the ditch is still present. The ditch ran West to East flowing into the Aranyhegyi Stream, before joining the Danube. It was clearly visible that the winding bed observed in the excavation area curved around that elevated sand bank on which the remains of the prehistoric settlement and later the Roman Period bath building were located. In the Roman Period, the Rádl Ditch acted as a conduit. This is also demonstrated by the fact that the water of the bath was carried off by channels towards the ditch and the contents of this natural water-course passed into the Aranyhegyi ditch and from there into the Danube (*Picture 50*).

The system of defensive moats of the Early Roman Period military feature found in this territory also had some connection with the natural water-course. The results of the excavations carried out so far do not exclude the possibility that part of the natural ditch was incorporated within the Northern defences of the fort. At any rate, the road running across the fort, supposedly because of the waterlogged soil found along the water-course, was built on poles over certain sections (*Pictures 51* and *52*).

In the Western part of the territory along the course of the Rádl Ditch was one of the largest cemeteries in Aquincum, used over several centuries (*Fig. 21*). On the basis of the depth data from almost 400 graves, the relief conditions of the former terrain could be reconstructed. It is clear from these data that the first graves were situated on the most favourable, highest parts of the territory and the less favourable parts were used for burial only in the Late Roman Period. In several cases, it could be observed that even the places of filled-in former ditches were used for burials. The reason was that it proved impossible to endlessly increase the area originally marked out for burials on the basis of the fixed system of limitation. Therefore, they tried to extend the area available partly by superposition of burials and partly by improving conditions in less favourable geographic conditions. Since the area marked out for burials, situated South and

Picture 50. End of a Roman Period stone channel which ran into the one-time Rádl Ditch. After the operation period of the channel the area, including the bank of the ditch, was used as a burial place (Filatorigát)



Picture 51. Path of a road standing on poles along the Eastern side of the one-time Rádl Ditch. The one-time ditch is marked by the difference in colour caused by its modern time filling (Filatorigát)

Picture 52. Moat of Roman Period defence works, which led into the bed of the one-time Rádl Ditch (Filatorigát)

West from the elevated sand bank already mentioned above was crossed in several places by drainage ditches; as these were filled new places for burials were gained.

The lowest-lying surface could be observed in the South-Eastern part of this territory, a bit Southwards from the bed of the Rádl Ditch. Most probably (ZSIDI 1998/3, 68) it was either a low-lying flood plain area with marks left by the activity of uprushing springs or a lake bed that had filled up naturally. Here, the hard, muddy layer in the fill was relatively rich in finds, no features or any other remains were found in it that reflected some other use of the area. The finds were distributed evenly, with most of the material consisting of ceramics, most wheich were found broken into tiny fragments.

These data suggest that is natural fill on the lake bed. At present, it is not known whether the wide ditch joining the North-Eastern part of the lake bed transported the waters from the uprushing waters that accumulated in the former lake bed towards the Rádl Ditch or whether the ditch itself flowed into the small lake, or perhaps, whether the ditch, adapting itself to prevailing hydrological conditions, (precipitation, groundwater, etc.) had a double function.

The natural water-course also played a role in life at the Avar settlement established here after the Roman Period. Considering the position of the semi-subterranean houses, it is clear that the inhabitants looked a close, natural water-course, which besides the nearness of the still-standing, although ruined, Roman building, must be another important factor in settling in that spot. Some of the Avar houses built close to the

bank of the Rádl Ditch were connected to the natural water-course through small ditches (for sewage disposal?)

That timber lattice structure brought to light near the Southern bank of the ditch and which supposedly played a role in the stabilization of the swampy soil, most probably was established in the period immediately preceding the construction of the Filatorigát. With the erection of the dam, a thick clayey and sandy fill entirely covered the diverted and filled up old bed, changing the character of the earlier environment.

5.4. The Óbudai Island in the Roman Period

5.4.1. A survey of earlier research es related to the history of the island

The Óbudai Island – widely known as Hajógyári (Dockyard) Island – came into its present form in the 19th century. The construction of a sheltered cove was an essential condition of shipbuilding there. Thus, Kis Island (the Small Island), served as the seat of the shipyard, was connected with Nagy Island (Big Island) by a land-bridge. Dredging the bed of the Danube became necessary both in the cove and in the Danube branch between the bank and the island. This work was carried out by the dredger Vidra between 1835 and 1837. During its work it hit up against walls in both places which it could scoop up only with great difficulty (KAISER – VARRÓ 1999, 14–15). These were Roman walls. The function of these walls as well as the connection of the way they functioned to the question of whether the island existed in the Roman Period at all or whether this area was part of the main land at that time has been the object of professional debate from the beginning (*Figure 36*).

In his historical work, written in 1878, Ferenc Salamon definitely takes the position that in the Roman Period, Hajógyári Island was connected to the main land. He emphasized that his opinion was verified in part by the presence of the above-mentioned walls (*Figure 36.* 9–10), and which had been surveyed by Gusztáv Zsigmondy in the Óbuda Danube branch and in part by those Roman Period ruins on the island which were already known at that time.[107]

F. Salamon wrote about Fürdő Island (Bath Island) as well which had been scooped up during the 19th century river bed control works. He quoted Mátyás Bél who saw willow bushes on the 200 steps long and 60 steps wide island. He also mentioned that during higher water the island was usually inundated by the Danube. He stated also that the end of the Fürdő Island facing Margaret Island consisted of mud. He also observed several warm springs in the island.

The next author quoted by Salamon was Sándor Németh. In 1823, he mentioned Roman Period baths on Fürdő Island as well as walls of one and a half fathom width were found beneath under the water on the Northern tip of Margaret Island facing the South tip of Fürdő Island. Unfortunately, these walls, too, were dredged out during water control work on the Danube. From the above-mentioned observations, Salamon drew the final conclusion that Margaret Island, Fürdő Island, Nagy Island and Gyár Island had all been connected to the Buda bank.[108] Where Újpest Island sits now ran a Danube bed. The island came into being when the bed of the Danube was shifted towards the Buda side creating the above-mentioned islands by separating them from the land (SALAMON 1878, 296–298). As seen above, he attempted to support his arguments using historical data, namely the walls observed in several places in the Danube bed. The scientific world time knew very little about the topography of Aquincum, thus, it seemed obvious that the above-mentioned wall remains demonstrated that land must have existed in their places.

Several small bar islands at the Northern end of the Nagy Island in Óbuda are clearly represented on 18th–19th century maps, although they do not add to the solution of the question.[109] A map from 1873 (*Picture 53*) shows many water-mills in the territory investigated Aquincum archaeologists. Kis Island, where the most important buildings of the shipyard can be seen, was already connected with Nagy Island.

János Szilágyi challenged whether the walls surveyed in the Óbuda bed had ever existed (*Figure 36*, 9–10), claiming that they were simply wall masses that had fallen into the river from the bank. At the same time, he refuted Cholnoky's opinion, who, referring to the opinions of

[107] On earlier opinions concerning the more detailed geomorphology see chapter 3.5. in this volume.

[108] For its reputation from F. Schweitzer see the geomorphological section in this volume.

[109] On this see also chapter 3.5 in this book and picture 62.

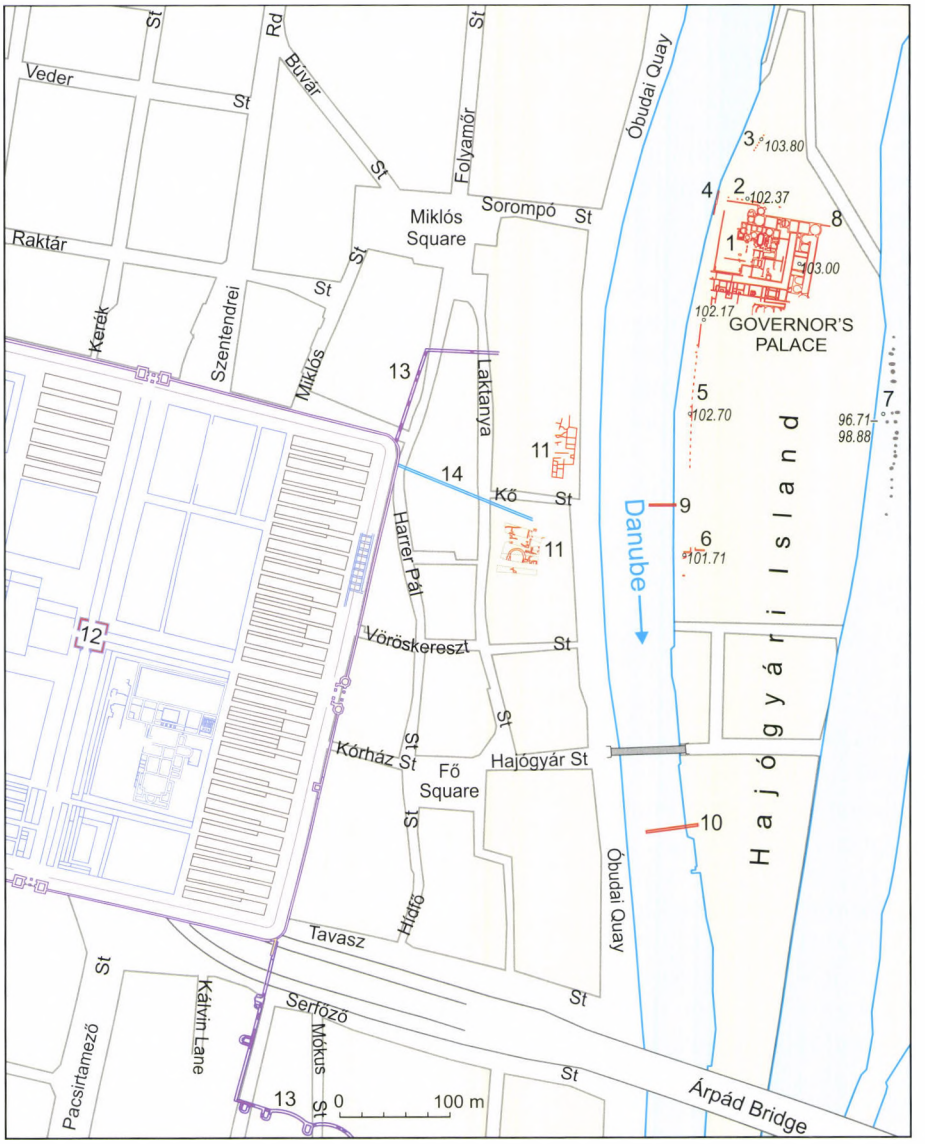


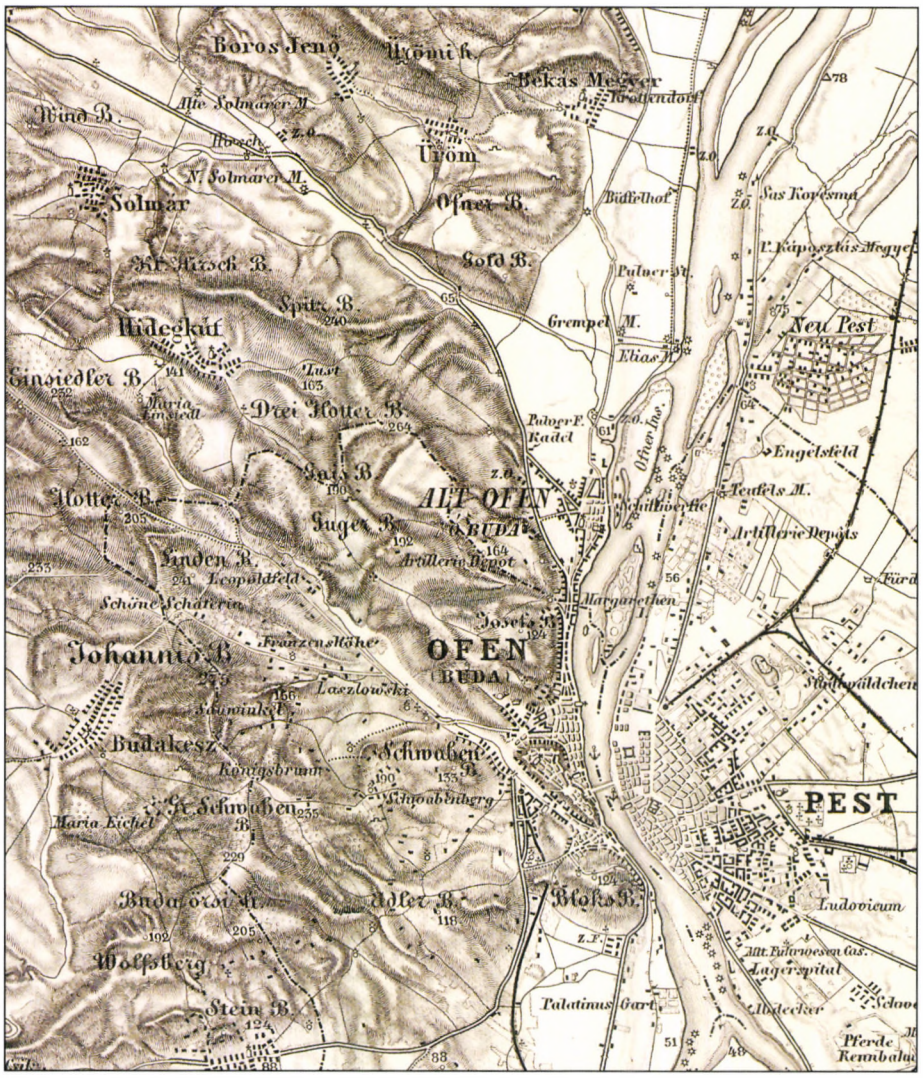
Fig. 36. Roman Period buildings in the Hajógyári Island (Katalin H. Kérdő – Anikó Kovács – Mrs. A. Vándor). – 1 = Governor's palace, main building; 2 = Main sewer and road; 3 = Foundations of pillars; 4 = Western closing wall of the palace complex; 5 = Parts of buildings, earlier unknown; 6 = Tower and part of the southern closing wall of the palace complex; 7 = Pole remains of Roman Period quay in the river port; 8 = Excavated segment of the original margin of the island; 9–10 = Walls, surveyed by V. Zsigmondy in the Óbuda Danube branch; 11 = Public baths; 12 = The earlier legionary fortress and part of the Late Roman Period fortress; 13 = Parts of the wall of the Late Roman Period fort; 14 = Sewer canal

M. Kretzoi, F. Pávai Vajna and J. Sümeghy, disclaimed the existence of the island in the Roman Period. Archaeologically, he spoke of the channel excavated in the Northern foreground of the Governor's palace (*Figure 36*. 2). The channel had a slope of 1.3% toward the Kis-Duna branch over a 50 m long section and, over the last 4 m, it descended by 25 cm. After this, breaking through the Roman Period wall in the Western river wall on Kis Island through a regular opening (*Figure 36*. 4) joined present-day Kis-Duna branch at Óbuda (SZILÁGYI 1958, 54).

Based on the presence of bridge posts found during the survey of Fürdő Island, one of the islands scooped out during the river control work on the Danube in 1874–1875 (*Figure 17*) as well as the votive altar stones found there (*Picture 54*).[110] István Wellner did not exclude the possibility that in the Roman Period it was connected to Óbudai Island. According to him a bath and perhaps a villa with richer decoration stood there in the vicinity of springs in the Roman Period. Wellner thought that even if the Fürdő Island was still an independent island in the Roman Period, the water of the springs might have been drained off as well. At the same time, he emphasized that the island – at least on the 18th–19th century maps – was too small to have had large buildings on it (WELLNER 1970, 20).

Recently, Margit Németh studied the question of the Roman Period bridge and the defensive system. On the basis of the original drawings, she

[110] The altar stones found here: CIL III. 10395, 10484, 10490, 10405, 10406, 10416, 10474. The first one was dedicated to the Danube (its last reference TitAq No 45). The other altar stone dedicated to the Danube and found on Óbudai Island was already mentioned in chapter 4.1. in this volume (*Picture 18*, TitAq No 46).



Picture 53. Map of Budapest from 1873 with the Hajógyári Island (From the collection of the Museum of Military History)

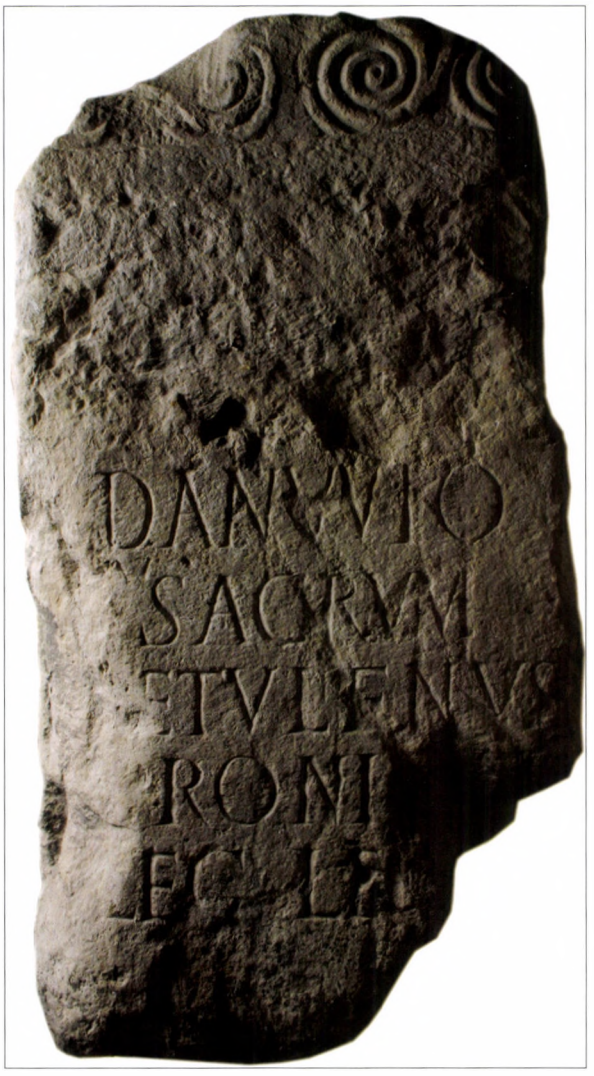
stated that the poles surveyed on Fürdő Island were part of the foundation of a great post structure from the four pillars of a bridge leading across the island. She mentioned analogies from the Rhine region. She suggests that the altar stones which came to light here and in the bed of the Danube and by the Northern tip of Margaret Island with inscriptions referring to governors and other high ranking persons or erected for the welfare of the emperor, might also reflect the existence of a military building there. On the basis of what was known at that time, she did not exclude the possibility that the walls surveyed by Zsigmondy in the Óbuda Danube branch might be parts of a dam or a harbour contruction (NÉMETH 1999, 2000/1).

Excavation from the end of the 1960s of the last century together with large-scale construction works in Óbuda and continuing to a lesser extent today produced results that add to the new interpretation of the so-called Zsigmondy walls found in the bed of the Danube. As a result of these excavations the extent and structure of the legionary fortress and the *canabae* surrounding it became clear and furthermore demonstrated that Zsigmondy walls found in the Danube bed were definitely not the protecting walls of the early fort, as earlier thought (NÉMETH 1999, 144, 146).[111] In addition, test trenches dug in the vicinity of the already known Roman Period Governor's palace (*Figure 36* 1) on Óbudai Island yielded new results especially as regards the building-over of the territory (KÉRDŐ 1997/3, 1999/1, 1999/2, 2002).

Margit Németh carried out test excavations and observed the line of the original bank of Kis Island from a time preceding Danube water control works in the Southern part of the island. This line in the Western area was, more or less, identical with the line that existed in the Roman Period. Pole remains also came to light (unfortunately without datable finds). The preliminary report also mentioned some earlier wall remains along the mid-line of the island, though their date cannot be determined (NÉMETH 1994/2).

In November of 2000 by the Western bank of Hajógyári Island cove, posts came to light from the river bed during low water (*Figure 36. 7*).

[111] See also chapter 4.5.



Picture 54. Altar stone dedicated to the Danube, from the one-time Fürdő Island (from the collection of the Hungarian National Museum)

The row of posts began approximately along the line of the Southern end wall of the main palace building and ran Southwards over 200 m (NÉMETH 2001, KÉRDŐ – TÓTH J. 2003). Based on the results of dendrological analyses, the feature was continuously under construction in the first half of the 2nd century AD. The section cuts of the wooden material of two analyzed posts dated to AD 130 and 187 respectively (LÁNG – GRYNAEUS 2005, 92). The posts are certainly the remains of the Roman Period bank fortification. The survey of the system of posts continued in 2003.[112]

Thus, until recently, from the point of view of archaeological results (that is until the latest investigations presented in this volume), the existence of Kis Island in the Roman Period was taken for granted. This idea was supported by the opinions of geologists who corroborated this conviction and by e new results from archaeological topography. However, because of 19th century river control works on the river bed and dredging at the original line of the bank and the bed can no longer be studied (*Picture 55*).

Picture 55. Remains of Roman Period quay at the Western bank of the Hajógyári Cove

5.4.2. The building complex of the Governor's palace in Aquincum

The earliest parts of the palace were supposedly built by Hadrianus, later emperor, who was the first governor of Pannonia Inferior between AD 106 and 108. Later, it was altered and extended several times. These changes were connected with large-scale constructions in the Civil and Military towns of Aquincum that were carried out in the two golden ages of the town, that is, during the reign of Hadrianus and the *Severan* Period. The official recognition of this development took place when the Civil Town was raised to the rank of *municipium* (about AD 124) and later to the rank of *colonia* (in AD 194).[113] Those artisans involved in inside decoration, especially the painters, left their mark upon the interior design of the buildings in the Civil and Military Towns.[114] Based on excavations made during excavations, the palace was emptied systematically and abandoned in the last third of the 3rdcentury AD because of rises in Danube water-levels.

[112] KÉRDŐ – TÓTH J. – NÉMETH – KIRCHHOF 2004.

[113] See also chapters 4.2. and 4.5.2.

[114] PÓCZY 1958, WELLNER 1971/2.

The time it was abandoned also seems to have been connected to events surrounding the wars along the *limes*. Supposedly, the residence of the Governor was then moved to the Óbuda-side banks of the Danube.

The Topographic position of the Governor's palace

The Governor's palace in Aquincum stood in the Northern part of the former Kis Island, opposite the North-Eastern quarter of the Military Town, including the most impressive administrative and private buildings. It was probably connected with the fort of *Transaquincum* on the Eastern bank of Danube with a bridge as well as with h the *canabae* (*Figures 16* and *17*).[115]

Latest research has shown that the palace wasconnected in the direction of the Civil Town as well, as suggested by the recently excavated bridge-head standing opposite the Western margin of Óbudai Island, on a stretch of river bank between the Military and Civil Towns.[116] Archaeological excavations have also shown that the building known to date as the palace itself was actually the main building in a complex of buildings, which supposedly extended over the whole territory of Kis Island.[117]

Description and interior design of the main building

The main building of the Governor's palace was the most significant building in the main town the province (*provincia*) and accordingly it was the most impressive building regarding its design as well. Its ground-plan represents a mixture of villas with a *peristylium* and villas with a *porticus*. It comprised the dwelling place of the Governor, premises for representation, shrines, a bath-wing, as well as out-buildings and storage rooms (*Figure 37*).

The previously known area of the palace was about 120 x 150 m. It consists of two buildings, the less investigated, so-called building No. II lies on the Southern side (*Figure 37.* 19). The rooms in the main building with a central layout were situated around a courtyard with a colonnade (*peristylium*). Nearly a hundred rooms have either been either fully or partly excavated. During archaeological investigations their function was clarified as well.[118] Premises used for representational purposes, with the audience chamber in its middle lay in the Eastern wing. Entering through the *porticus* a visitor would have gone through the passage-ways running along the two sides of this chamber into the corridor surrounding the *peristylium*. All the other wings of the building and the courtyard could be approached from the *peristylium*. The 75 m wide, storeyed main front of the building lay on its Eastern side. At each of its two ends, stairs led to the upstairs portico from the corner towers providing a view on the harbour. Dwelling areas and the bath-wing with an associated water-tower lay in the Northern part of the building. Service rooms and a granary were located in the Southern wing of the building. A shrine was also excavated in the palace. The impression of an inscription from an altar dedicated to *Mercurius* was preserved in the mortar on one of its walls. This shrine was later re-built and the majority of those altars preserved *in situ* were dedicated to the *Capitoline Triad* (Iuppiter, Iuno and Minerva), with only one exception – the altar dedicated to Iupiter.[119] Most of the individ-

[115] See chapter 4.8.

[116] ZSIDI 1999/2.

[117] KÉRDŐ 1997/3, 1999/1, 1999/2.

[118] Results of investigations carried out at the Governor's palace can be summarized as follows: The first excavations took place between 1851 and 1857. (SACKEN 1857). At that time, several meters high walls from the building were still preserved. Unfortunately, the fate of these walls was sealed by the establishment of the shipyard there which operated till the beginning of the nineties of the last century. Factory buildings and roads were built over the ruins and foundations of pipes, industrial features were dug deep into the ground. Archaeological excavations were connected without exception to constructions at the factory. These excavations were directed by János Szilágyi who published the results together with his colleagues in the periodical, Budapest Régiségei. The excavations and publications in chronological order are as follows: 1941 (SZILÁGYI 1945), 1951 and 1953 (SZILÁGYI 1955), 1956 (SZILÁGYI 1958). Two minor rescue excavations were carried out in 1970 (SZILÁGYI 1973) and in 1977 (KABA 1978). Trial excavations were initiated in 1996 (KÉRDŐ 1997/3) and 1998 (KÉRDŐ 1999/1, 1999/2) – their aim was to determine the extent of the palace. Today, the territory is declared a historic monument. The finds, which came to light from the palace, among them wall-paintings and mosaics, are held in the collections of the Aquincum Museum.

[119] The military Lars (*Lares Militares*) and other gods and goddesses whose names were not noted precisely also appear on the altar stones in addition to the name of Iuppiter. The altar stones erected by governors and found in the shrine: SZILÁGYI 1955, 406–407; SZILÁGYI 1967, 75. *Gaius Valerius Sabinianus* (185–187/88): FITZ 1993–1995 536, No. 320.1. *L. Cornelius Latinianus*

Fig. 37. The ground-plan of the Governor's palace, with the functions of the premises (after Klára Póczy – Katalin H. Kérdő – Anikó Kovács – Margit Molnár). – 1 = Entrance portico (porticus); 2 = Corner tower; 3 = Audience chamber; 4 = Inner corridor; 5 = Dwelling room; 6 = Bath wing; 7 = Water tower; 8 = Fountain; 9 = Shrine of emperor cult; 10 = Inner courtyard; 11 = Granary; 12. = Passage corridor; 13 = Sanctuary; 14 = Service rooms; 15 = Heating room; 16 = Lavatory; 17 = Heating corridor; 18 = Cellar; 19 = Building No. II.

uals who erected the altars were the governors themselves. The entrance to this room was on the Eastern side and opened onto a passage corridor (*Figure 37.* 12) leading into so-called building No. II (*Figure 37.* 19).

In the centre of the inner courtyard stood the *podium* shrine dedicated to the worship of the divine emperor. A larger-than-life-size statue of an emperor was found beside the shrine. The well excavated in the courtyard was decorated with a gargoyle in the form of a dolphin. [120]

Naturally, the palace was furnished with all the comforts of the age. Several rooms had floor-heating. The water supply of the bath-wing and the well in the courtyard was transported though an extended network of water conduits and channels.

The interior design, of the building was commensurate with the rank of the person of the governor who had charge of both the military and political affairs of the province. Several of the premises had floors of shaped bricks as well as *terrazzo* floors. Several other rooms, however, were paved by mosaic floors.[121] Seven of these floors have survived although some of them only in a fragmentary condition. Two of the floors are known only from drawings made of them during 19th century excavations.[122] The floors with geometric patterns in the Eastern wing are in two colours, while the floors of the Northern wing are in several colours. Perhaps the most beautiful of the floors is one that ornamented one of the rooms in the bath-wing. It comprises a marine scene picked-out in several colours. While mosaic floors were essentially permanent parts of the buildings, walls were frequently repainted. Such renovation would

(127–130), FITZ 1993–1995, 520, No. 309; 1. SZILÁGYI 1967 75 = FITZ 1993–1995 520 No. 309. 2. *Ti. Haterius Saturninus*(161–164): FITZ 1993–1995 527,No. 314. 3. *M. Iallius Bassus Fabius Valerianus* (157), FITZ 1993–1995 1993 489, No 290. 4. There was no inscription on one of the altar stones and only a rough drawing of another one was preserved in the excavation diary. (KÉRDŐ 2008, 289–290).

[120] Statue of an emperor: AQUINCUM 1995 48, No 140; part of the well-house of the fountain: KISS 1987 32, No 10; the reconstruction of the well with the dolphin: AQUINCUM 1986 46. p. Abb. 14.

[121] KABA 1968, KISS 1973, 9–17.

[122] WELLNER 1971/2, 123. *Fig. 11*; KISS 1973, 13–15. *Fig. 8–9.*

have been unavoidable during alterations in the interior of the buildings (extending the heating apparatus, canalization etc.). Painters used pattern-books during their work and always followed the fashion of the age (*Picture 56*).

Picture 56. Detail of a painted wall from the Governor's palace (19th century drawing)

Apart from stratigraphic observations, dating of the wall-paintings made the most important contribution to the identification of construction periods.[123] The earliest wall paintings were made by artists who came from Italy and they worked only in the palace. Works of similar quality and style have not been found in Aquincum and analogies to the ones from the palace are known from the villa of Hadrianus in Tivoli. Later repaintings, however, are works by local Aquincum artists who worked in buildings in the Military Town and the Civil Town as well. The wall-paintings of the palace from the end of the 2nd century – beginning of the 3rd century AD were still produced in the so-called Pompeiian style 3. The decorations from the Severan Period, besides reflecting Italian traditions, already display very strong Eastern influences, especially motifs characteristic of Asia Minor. It was J. Fitz who first drew the attention to the fact that in the case of the Governor's palace, it was the first *consularis* governor, who may have played a large role in the spread of Oriental influences in addition to the general trends spreading at that time (connected to movement of people from the Eastern empire moving into the province. *L. Alfenus Avitianus* arrived to his new posting from Arabia and family bonds, too, tied him to that land.[124] The last repaints originated from the second half of the 3rd century AD and were already executed in the style which was widespread everywhere in the empire (*Picture 57*). Only some capitals from columns, pedestals and parts of ledges came to light during the excavations of supposedly decorated architectural elements from the interior design of the palace.[125]

The reconstruction of the main building, its main construction periods

The layout of the ground-plan of the main building and its reconstruction[126] represent the situation in the Severan Period when there were several re-building periods (*Figures 37* and *38*).[127] The main Phases in the history of the construction of the main building of the palace can be

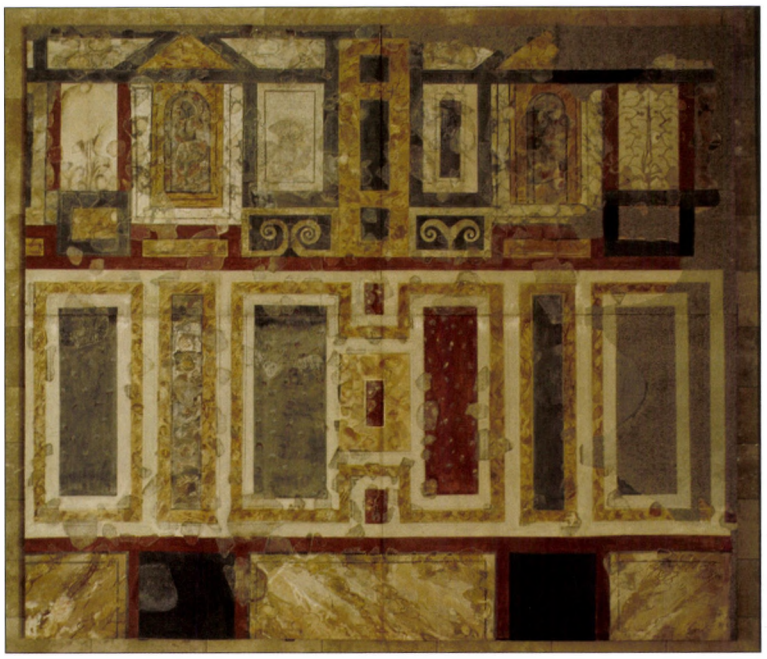
[123] PÓCZY 1958, WELLNER 1971/2. 340–343, 356–362, 384–390. One point of departure for solving chronological problems is K. Póczy's study on wall-paintings. Beside the catalogue, her reconstructions as well as her observations on repaints and the techniques used to make them are especially important. These observations would be of a help in studying both the old material and the finds that have recently come to light. On the possibilities for studying the still unpublished wall painting fragments see KÉRDŐ 2000.

[124] FITZ 1990/2, 270.

[125] KISS 1987, 31–32, No 1–4.

[126] HAJNÓCZI 1987, 128, HAJNÓCZI – MEZŐS 1995, 63.

[127] SZILÁGYI 1958, WELLNER 1970, SZILÁGYI 1971.



Picture 57. Reconstruction of part of a painted wall from the main building of the Governor's palace (in the permanent exhibition of the Aquincum Museum)

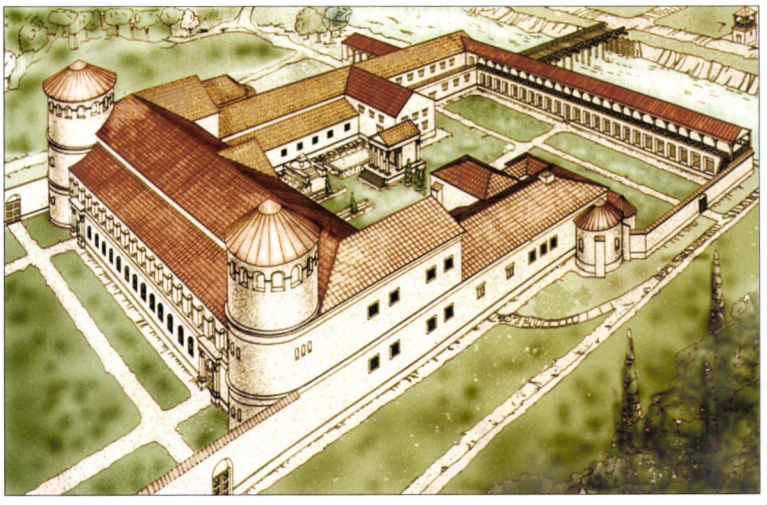


Fig. 38. Reconstructed image of the Governor's palace (computer illustration created by Krisztián Kolozsvári after Gyula Hajnóczi).

outlined on the basis of observations made during excavations and especially the chronology of the wall-paintings and mosaics.[128]

The earliest parts of the building, the remains of the palace of the *legatus* from the age of *Traianus-Hadrianus* are less well known. The wall remains below the floor level of the inner courtyard, the so-called Mercurius shrine in the Southern wing, building No. II and the earlier periods of rooms in the Eastern wing belong to this phase. The characteristic appearance of the main building was created during the Severan Period. The following parts of the complex were constructed at that time: the series of rooms with a central layout in the Eastern wing was built in its final form as well as the main front with its two protruding corner towers. The Eastern part of the Southern wing of the building and the new shrine built over the *Mercurius* shrine were completed. The votive altars stood in the courtyard of this new shrine. The out-building of the Southern wing were built as well. The suite of rooms occupied by the governor himself attained its original form in the Northern wing in this period. The shrine for the emperor worship was built in the inner courtyard as well as the earlier parts of the bath-wing. The last great construction period at the palace most probably began in the second decade of the 3rd century AD, when a *consularis* governor moved into it after AD 214. Alterations on already existing rooms and the building-over of the Western part of the courtyard continued. In the inner courtyard, the well house was completed as well as the latest North-Western parts added to the bath-wing. The repainting of the walls was on-going. All these works lasted till the last third of the 3rd century AD till the unexpected abandonment of the palace.[129]

[128] The sharpest debate developed around the date of the building of the eastern wing. On the recent debate connected to the history of architecture KÉRDŐ 2003/1, 116–117. footnote 11.

[129] The systematic abandonment of the palace is also shown by the fact that relatively few finds came to light during the excavations. Their latest publications with the references: Stone monuments: the statue of *Fortuna Nemesis* (SZIRMAI 1999, 37, No 19), head of a Genius (SZIRMAI 1999, 37. No. 18), a crater with embossed decoration (AQUINCUM 1995, 64, No 350). Small bronzes: a statue of a Satyr (SZIRMAI 1986, 7. No. 6), decoration of a wagon with the representation of Mercurius (SZIRMAI 1986, 6, No. 4). Others: a glass

5.4.3. The extension of the Governor's palace based on the results of the latest research

Earlier research was not concerned with the extent of the Governor's palace. Recognizing certain differences in the construction phases, on the basis of data available to them, archaeologists reckoned only with the existence of a single additonal building at best besides the well-defined block of the palace known at that time. Therefore, they looked for analogies to the palace among separate block-like buildings (especially among buildings of commanders, the so-called *praetoria* and palaces of *legati*)[130]. Archaeological excavations in the 1990s aimed at identifying the extent of the palace yielded unexpected results. At a distance of 228 m South of the Southernmost wall of the building known until that time, a thick East–West running end wall of the palace and the remains of an adjoining tower came to light.

It seems that the end wall connected to the wall which ran along the Western river wall in a North–South direction, a section of which was excavated earlier (*Figure 36.* 4, 6). Unfortunately, its place is now marked only by stones washed out from the river bank of Kis Island and its remains were essentially washed away by the Danube. A room from a bath thus, came to light between the Southern end wall and the main parts of buildings.

Their position demonstrated that between them and the above-mentioned Western end wall another series of premises whould be reckoned with.[131] Although the pillar remains observed in the North from the Northern end wall of the palace building (*Figure 36.* 3) could not be dated through archaeological means, they may be part of some connecting structure (e.g. an aqueduct) in the direction of the Civil Town and the newly excavated bridge head. Since springs were observed in this same place (*Figure 39, Picture 13*) it cannot even be excluded that that the water supply of the Northern wing of the bath was based on local springs or else the water was transported there from the direction of the legionary fortress over the bridge which certainly already existed at that time. Moreover, water could also be supplied from the East, over the already mentioned Roman Period bridge leading to *Transaquincum*.[132] On the basis of new data, it seems that the complex of buildings occupied the entire territory of Kis Island from East to West and to the North. In the South of the island, the tower and end wall found in 1996 (*Figure 36*) may mark its border.[133] Furthermore, roads, de-

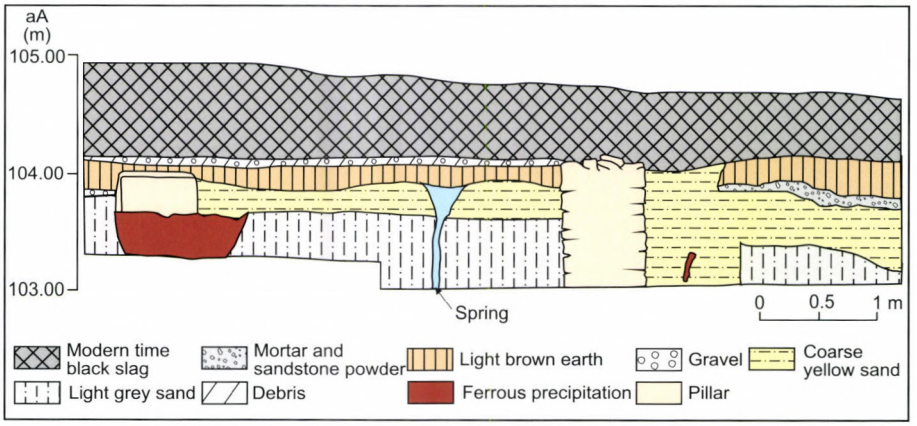


Fig. 39. Profile with the excavated pillars and occurrences of upwelling springs in the Hajógyári Island (Mrs. P. Czirják – Anikó Kovács – Margit Molnár)

with the PROPINA inscription (BARKÓCZI 1986, 59. No. 23), tegula, with a magic square on it with the inscription SATOR-AREPO (MAYER – VELAZA 2000, GY. NÉMETH 74–76). On the stone monuments with inscriptions found in other parts of the island and in the neighbourhood from the Danube most recently NÉMETH 2005/1.

[130] Mc Kay mentions the *praetorium* of *Vetera Castra* (Xanten), the palace of the *dux Ripae* in Dura Europos, Carnuntum /Bad Deutsch Altenburg/ (PISO 1995, 209. p.), as well as the pre-Constantine Period of the *praetorium* of Trier as analogies (Mc KAY – FELLMANN 1984, 223, 225–226). Some parallels can be observed between the corresponding periods of the *praetorium* of *Colonia Agrippinensis* (Cologne) and of the Aquincum palace (PRECHT 1973, 109–111), although the position of the previous one is different since it lay within the city walls (PRECHT 1973, 5. Taf. 1).

[131] In parts of buildings excavated here the stamps COH VII BRΛN could be observed over a long section, within the mortar of the pulled-down wall. On this basis it may be dated to the age of Caracalla.

[132] WELLNER 1970, 119–120, NÉMETH 1999, 142–144.

[133] Research carried out in 1998 demonstrated that the Southern end wall did not continue down to the Eastern bank of the island, but turned Northwards at a distance of about 3 m from the tower. This can be explained by

fensive and signalling towers may be reckoned with, not only on Kis Island but also on Nagy Island. Thus, the palace was certainly much more protected has previously been thought. The area of the palace known earlier was 120 x 150 m (1.8 ha). The largest dimensions of the building complex is 535 m in a North–South direction and 180 m in a East–West direction (ca 8–10 ha).

There must also have been parks, gardens, colonnades, shrines and out-buildings among the buildings within this huge area. This corresponds with new results from research at Apulum, where the complex of the buildings at the *praetorium* of the governor of Dacia occupied an area of 4–5 ha or even more.[134] The existence of a similar building has been suggested for *Carnuntum*, the capital of *Pannonia Superior*.[135] The even larger area of the Governor's palace in Aquincum can be explained by its geographic position, namely, that it lay on an island (or on an artificial island) and the advantages of this favourable location were successfully exploited. The palace occupied a separate position. Furthermore and especially, the above-mentioned administrative buildings in the legionary fortress and the *canabae (Figure 28)* served as the places official duties were carried out in. Thus, it seems the palace was primarily the private residence of the Governor, which also included spaces used in representation, part of the position of the Governor. Very likely, the emperors who frequently visited Aquincum preferred to stay in the palace rather than in the crowded Military Town.

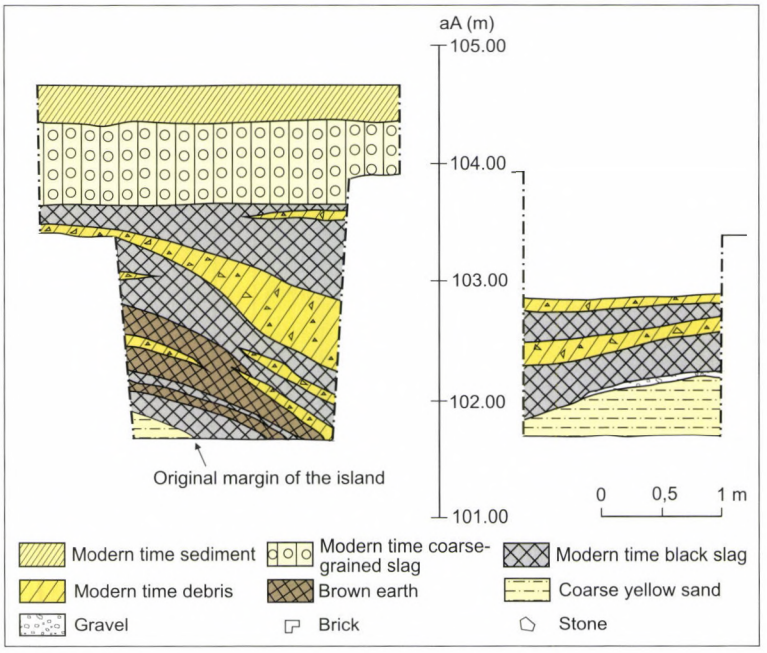


Fig. 40. The original margin of the island at the Western bank of the Hajógyári Cove in the profiles of the archaeological trial trench (Mrs. P. Czirják – Anikó Kovács – Margit Molnár)

Research in past years, especially observations made by Ferenc Schweitzer at sites, yielded several new data on the geomorphology of the island. The excavations carried out by Margit Németh at the Southern end of the island made clear that the Southern extensions of the island were formed in modern times. That system of posts she observed in the Eastern foreground of the Governor's palace and which was later surveyed and studied using dendrological methods (NÉMETH 2001, KÉRDŐ – TÓTH J. – NÉMETH – KIRCHHOF 2004)[136] and supposedly other posts as well on the south-Western banks of Kis Island marked the original line of the bank (or the line of the artificial wall of the channel). The line of the North-Eastern edge of Kis Island (*Figure 40*), came to light as well in one of the trial trenches (KÉRDŐ 1997/3) (*Picture 58*).

A North-West–South-East oriented natural river bed observed during an excavation suggests that several smaller islands may also

the fact that in another trial trench a natural ditch could be observed. *(Fig. 40, Picture 58).* Therefore, it is possible that in the Roman Period there were several smaller islands located in this area. The corner of a building was found East of the turn of the end wall. It will be the task of future research to clear up their chronological onnections. (KÉRDŐ 1999/2, 139–140).

[134] PISO 1995, 206.

[135] Carnuntum /Bad Deutsch-Altenburg (PISO 1995, 209). Similar buildings with a monumental character: Castra Regina /Regensburg/, Lauriacum /Lorch-Enns/, Colonia Agrippinensis /Cologne/ (PISO 1995, 208–209). On the connection of the canabae and the praetorium (PISO 1991, 141–142). The position of the *praetorium* in Apulum /Gyulafehérvár/ (PISO–DIACONESCU 1993, 78. Abb. 2.). On more detailed recent analogies KÉRDŐ 2008, 301–304.

[136] Dendrological analyses were made only on those posts which were surveyed on the Western bank of the shipyard cove. (LÁNG – GRYNAEUS 2005, 90, 100).

Picture 58. The original margin of the island at the Western bank of the Hajógyári Cove in the North-Eastern corner of the archaeological trial trench.

Picture 59. Segment of a natural river bed in the profile of the archaeological excavation in the Hajógyári Island

be reckoned with in the neighbourhood of the Southern end wall of the palace complex (KÉRDŐ 1999/2) (*Picture 59, Figure 41*). At the same time, it is also possible that one of the filled up beds of the Danube could be observed in the geomorphological reconstruction (*Figure 14*).

From the point of view of archaeology, it is not possible to unambiguously identify the nature of the connection between Óbudai Island and the mainland in the Roman Period. Establishing such connections will remain impossible even in the future because any possible proof has been destroyed as the result of modern dredging on the river bed and construction of embankments along the Danube. At the same time, based on his geomorphological investigations, Ferenc Schweitzer took up a definite position in this volume (compare chapter 3.5). In this case, the East–West running channel for sewage disposal which ran North from the main building may have flowed into an artificial channel, just like the channels in the Military Town and the legionary fortress situated in the same line as Kis Island. The sewer pipes brought to light South of this area led into the Danube as well.

There are several possible dates for the creation of the artificial river bed. The earliest date may have been the first decade of the 2nd century AD, when the main town of the province was being built-up. It is more probable, however, that it was formed in the second decade of the 3rd century AD, during the construction boom of the Severan Period. This idea is supported by archaeological observations, that is, the inscription COH VII BRΛNT was found on the walls of the main sewers which led into the Danube and on the stamped bricks used to cover the sewers. Similar finds came to light in the main sewer of the Governor's palace. These finds suggest a large-scale, well-organized development and alteration of the network of channels, carried out in cooperation with the

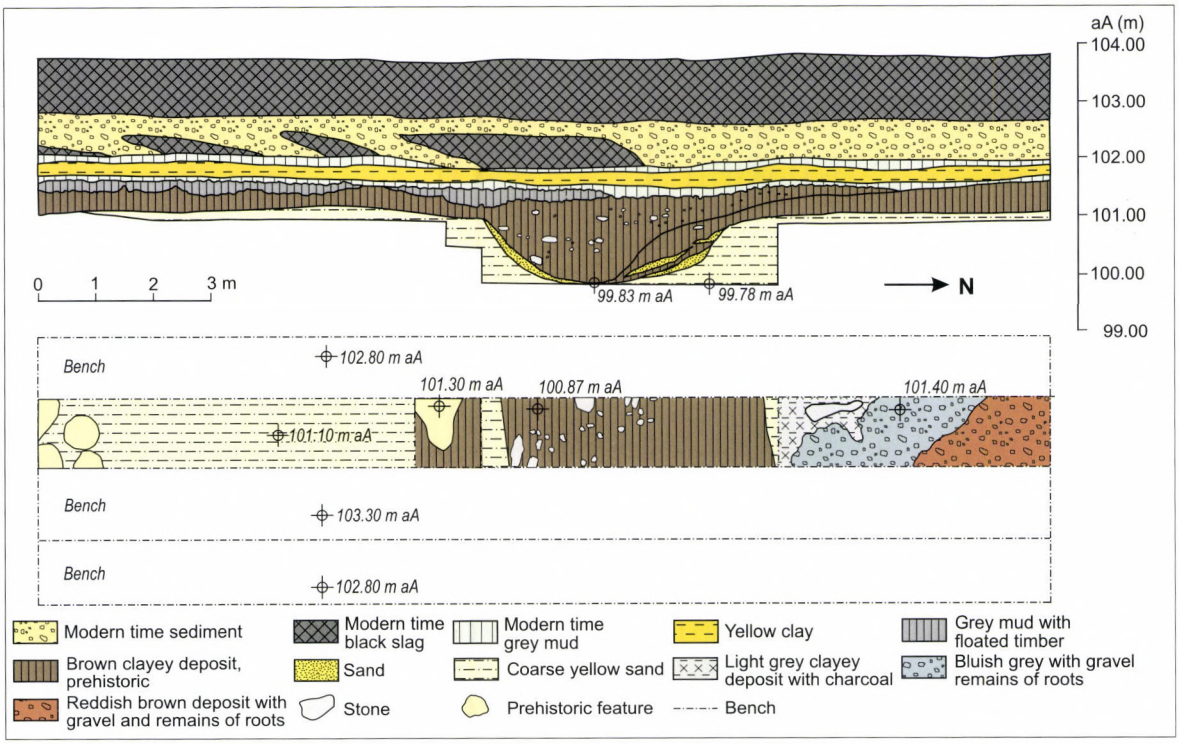


Fig. 41. Archaeological profile and ground plan with the ditch of natural origin in the Hajógyári Island (Mrs. P. Czirják – Anikó Kovács – Margit Molnár)

military forces (PÓCZY 1976/3, 82, NÉMETH 1976/4, 417). At that time, large-scale construction works were also carried out in the complex of buildings that comprised the Governor's palace.

The impressions on the stamped bricks of this same military unit were preserved (KÉRDŐ 1997/3, 33, 2008, 298, footnote 34) in the mortar of the long section of wall running parallel to the Western margin of Hajógyári Island (*Figure 36.* 5). At the same time, the function of "Zsigmondy's walls" are still unknown.

The main technical data concerning the dredging work has survived as they were published by József Biró (BIRÓ 1985, 13–14). Before the establishment of the shipyard a perambulation was carried out in the territory by the authorities on the 2nd of October, 1835. The height survey was produced by the water conservancy engineer, Károly Kecskés. The lowest point on the island lay at 4.98 m while the highest point on the island lay at 7.90 m above the O point of the Buda water gauge (at 94.97 m aB, that is, at 95.65 m aA).[137] Data on the channels are important, too, though the exact place of part of them cannot be identified precisely based on the descriptions. Further investigations will be necessary to identify them. The dredging of the channel leading to the shipyard took place between the 18th of November in 1835 and January of 1836. The cove for the shipyard as well as the channel leading to it was completed at that time. The width of the channel is 8 fathoms (15.1 m), its length is 20 fathoms (57.9 m) and its depth is 4 feet (1.26 m) over the 0 point of the Buda water-gauge (that is, at 96.23 m aB that is 96.92 m aA).[138]

The dredging-boat called the Vidra was involved in deepening the Óbuda Danube branch in the Spring of 1836 as well as the channel for the winter harbour. This particular channel was 54 fathoms (101.92 m) long, 8 fathoms (15.1 m) wide and 6 fathoms (1.89 m) deep. Shortly afterwards, further dredging work was carried out to make ship launchings more safe. The basin was further deepened to a depth of 6 feet (1.89 m), the channel elongated by 20 fathoms (49.1 m) and its width increased by 3 fathoms.

[137] 15 feet 9 inches, 1 line that is 25 feet.

[138] In the sources the conversion of long measures is contradictory (BÍRÓ 1985, 13–14. (The editor.)

Roman Period wall remains were found at that time which the pile-drivers broke into fragments. As mentioned above, the springs observed North-West from the main building played a role in supplying water for the building complex of the Governor's palace. (KÉRDŐ 1997/3, *Picture 13).*

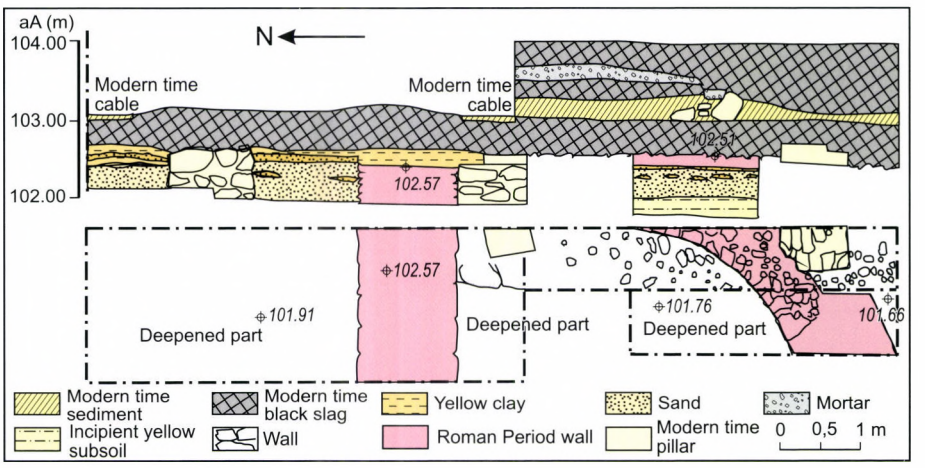


Fig. 42. Ground-plan and profile with traces of a flood within the trial trench deepened in the area of the Southern surrounding wall and of the tower on the Hajógyári Island (Mrs. P. Czirják – Anikó Kovács – Margit Molnár)

Based on the generally accepted opinion of researchers, rises in Danube water levels might have contributed to the abandonment of the palace complex. At some points, in the stratigraphy of the profiles of the trial trenches "floating bricks" and fragments of wall-paintings were observed (*Figure 42*).

These finds seem to corroborate this hypothesis. Unfortunately, however, in the investigated parts, modern fill covered the layers in question making it impossible to pinpoint the time water-level rose. At best, in those places which have not been disturbed in modern times, new results may be expected during further research.[139]

Finally, here it should be mentioned that from the viewpoint of the exhibition possibilities of the palace complex it is of fundamental importance to take into consideration the present highest water levels of the Danube (LNV). Transferring the highest water level of 1994 onto the architectural profile published by János Szilágyi (SZILÁGYI 1971, 54) it is clear that at such a high water level, water would cover the Roman Period floor levels, with the exception of the higher-lying parts of the North-Western wing of the bath building. At that point, water-levels were at 103.25 m aA (102.58 m aB)[140]. At its peak on the 8th of June in 2010, the 827 cm high water level lay at an altitude of 103.92 m aA (103.24 m aB)[141] (*Figure 43*).

5.5. Paleochannels of ancient water-courses in Budaújlak

5.5.1. Gully, artificial channel or former Danube branch at Budaújlak

The shallow bed (*Picture 7*), described briefly in chapter 4.6.2. and represented on *Figures 32* and *33* is probably a formation with natural origins that developed in the Holocene. It was already formed by streams running down from the slopes of Remete Hill and Kis Kecske Hill into the Danube before the period of the first settlements here (Late Neolithic Period, Copper Age). Its direction to the North is unknown but to the South it joined the Szépvölgyi Ditch (HABLE 2000/1). In the Roman phase in question this intermittent gully disappeared gradually (it filled up). From the second half of the 2nd century AD a network of artificial aqueducts based on karst springs was established (see chapter 4.6) and a regular system of ditches was constructed to transport surplus meteoric water and artesian water (BERTIN 1997, 21; 1998, 40 etc., HABLE

[139] Investigations were carried out connected to the construction project "Álomsziget", under the direction of Zoltán Havas on the Nagy(Great) Island. For his results see the volumes of the Aquincumi Füzetek. Z. Havas: Test Excavations on Óbuda (Dockyard) Island. AqFüz 14 (2007) 24–39. Idem: Excavations on the Dockyard Island in Óbuda in 2008. AqFüz 15 (2008) 30–43, Z. Havas – A. Tóth: Excavations on the Dockyard Island in Óbuda in 2009. AqFüz 16 (2009) 68–85. Results see in this volume (chapter 8.1.).

[140] Vízügyi Évkönyv 1994.

[141] www.vizugy.hu

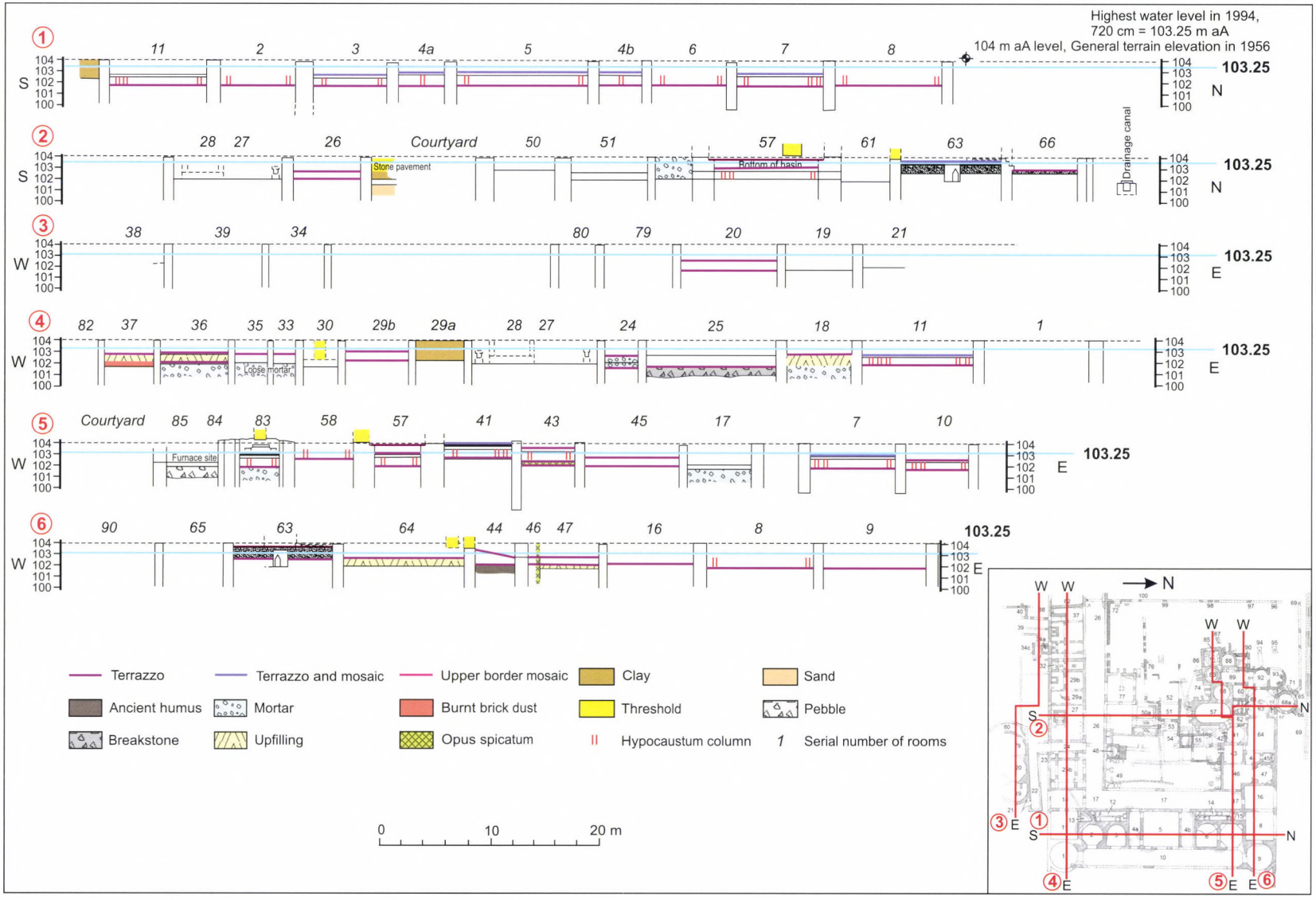


Fig. 43. Summary data of levels of the Governor's palace with the representation of the maximum water level (LNV) of the 1994 year flood (compiled and drawn by Katalin H. Kérdő – Anikó Kovács – Margit Molnár, after F. Schauschek – J. Szilágyi)

1995, 23 etc., *Fig. 8*; 1996, 30, *Figs. 15.* and *38;* 1999/1, 40. *Figs* 2 and 41 etc.) (*Figure 44*).

There are no credibly published archaeological finds which would support a date of the filling up of the bed in the Roman Period (FÜLEKY – MÁRITY 1998, HABLE 2002, 272, note 75).

Based on observations of earlier excavations, the bed was silted up the first time as the result of great flood events of the Danube at the end of the 1st century AD, then, after it was cleared, the process repeated itself in a wetter period in the second half of the 2nd century AD. Probably, the previously mentioned buildings with post foundations (see chapter 4.6.2, *Figure 33*) were built over the already completely filled up channel by the beginning of the 3rd century AD.

The minor conduits in their neighbourhood, running perpendicular to the broad channel, were formed at that time. As a result of continuous erosion and of repeated floods in the middle of the 3rd century AD this latter system of channels, too, was filled up. (FÜLEKY – MÁRITY 1998, 239 etc.). In its Northern section (under Bokor Street – HABLE 1995) Late Roman Period graves were dug here and there into the dark, brownish grey sediment of the large bed that previously widened or curved to the North-East (HABLE 1999/1 42 skk).

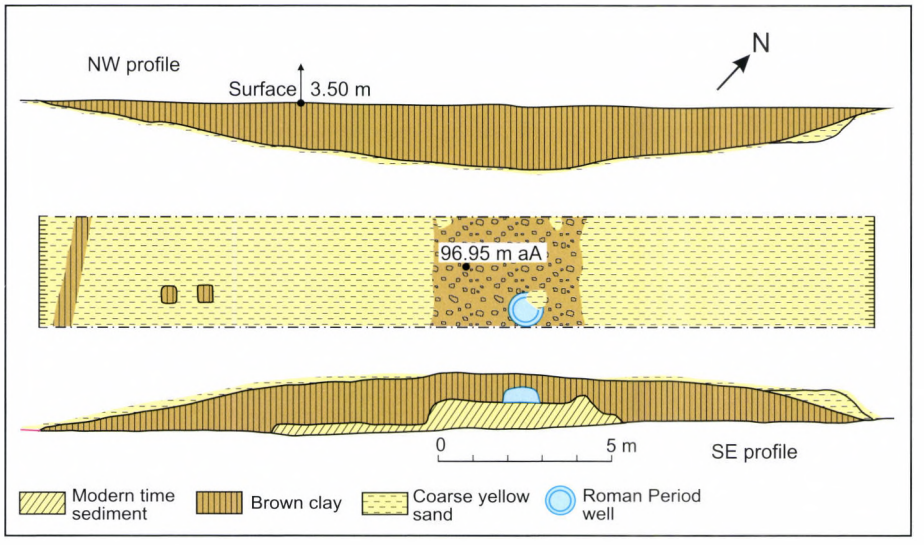


Fig. 44. Ground plan and archaeological profile of an abandoned streambed at Budaújlak (Margit Molnár after Erzsébet Márity – Mrs. P. Czirják)

5.5.2. The appearance of the so-called Szépvölgyi Ditch in an archaeological excavation

In 1998, a rescue excavation preceding construction work was carried out n adjoining lots at 18–22 Szépvölgyi Road (FACSÁDY 1999/4).[142] A "surface" or a layer containing alluvium, stones and ceramic material originated from several periods was observed within the excavation trenches. During the continuation of this work, it became clear that a large quantity of stones had come there as an alluvial deposit, which cut across the grounds to be excavated in a relatively well-defined strip running in a North-West–South-East direction.

Its surface appeared at an altitude of 111.90 m aA. Its thickness could not be established. At 108.32 m aA there was a layer mixed with sand and pebbles. In order to prevent accidents the trench could not be deepened. Stones of various sizes were deposited in a considerably thick layers dragged material from neighbouring prehistoric settlements of different periods in a random distribution and quantity.

We found ceramic fragments from the Roman Period, too. During the Roman Period, the ditch may have been active (*Picture 8*) thus, it was naturally impossible to find settlement remains. Later, however, this branch ceased to exist and, based on Zoltán Kárpáti's observations, settlements were already founded during the Arpadian Period over the filled up place.

[142] We could confirm the presence of the Szépvölgyi Ditch in another archaeological excavation as well (II, 7 Felhévizi Street–31 Ürömi Street. FACSÁDY 2002/1. 136). However, geodetic data are not sufficient for it to be represented on a map. Further appearances of the Szépvölgyi Ditch in excavations: III, 49–61 Szépvölgyi Road, see. Z. KÁRPÁTI Z., Aqfüz 8 (2002) 136–137. II, 7 Felhévizi Road. Hrsz.: 14840/31, see Z. KÁRPÁTI, Aqfüz 11 /2005), 210-212. Furthermore: P. VÁMOS P., ER. Bp. II, 5 Felhévizi Street Hrsz.: 14863/31. Aqfüz 13/2007) 263–264, Z. KÁRPÁTI – Zs, M. VIRÁG, ER. Bp. II. 14 Szépvölgyi Road Hrsz.: 14863/31 Aqfüz 14 (2008) 189–192 with further references. (The editor.)

6. Utilisation of natural resources in the environs of Aquincum in the Roman Period

6.1. Harnessing springs and the sacred precinct in the territory of Római Strandfürdő

Those waterworks which provided most of the water for Aquincum between the second and fourth centuries AD were situated in the territory of the Római Strandfürdő (*Figures 16* and *17*). Archaeological investigations carried out in 1964 and between 2000-2001 (PÓCZY 1972, 1980/1–2, KABA 1976, LÁNG 2001, 2002/2) made possible reconstruction of certain parts of the Roman Period constructions (aqueduct, shrine, well-house, *Figure 45*) as well as of buildings from later periods (powder mill and the Tóvendéglő), which can be seen today in the territory of the open-baths.

On the basis of excavation results, it can be said that small (with an area of about 16 m^2) wooden construction houses were built over the more than 16 springs where they welled up from the earth. Water was conducted into conduits through large terracotta well-heads (*Picture 15*). Altars dedicated to different deities with some connections to water, health and medicine, (*Aesculapius, Hygieia, Silvanus and Sol invictus*) stood beside the well-heads. Water was transported from the small conduits through a system with a venation-like form into the main branch, a section of which, together with the side-branch can be seen in a reconstruction. In the territory of the Római Strandfürdő the initial section of the main conduit was a channel running on the surface with stone walls (*Picture 60*). The water was later driven up with the aid of a water tower to the tall pillared conduits in the territory of Római Camping, from where it continued Southwards. This North–South running aqueduct ran along more than 5 km till present-day Flórián Square and supplied water for the baths, public wells and private houses of the Civil Town (*municipium)* of Aquincum, its legionary fortress and the Military Town (*canabae*) that developed around it.

Besides its use in industry the territory had religious and cultural functions as well. A sacred grove and a *valetudinarium* (hospital) were built near the health-giving water (*Figure 45*). The small well-houses served also as "chapels". The altars of the above-mentioned deities (*Picture 61*), fragments

Fig. 45. The sacred precinct of Aquincum, based on the group of buildings and aqueducts excavated in the area of the Római Strandfürdő. (Reconstruction by Gyula Hajnóczi. Computer drawing created by Krisztián Kolozsvári).

of glass vessels, coins, a golden ring which came to light by the mouths of these springs represent offerings sacrificied performed during a annual springtime festival (*Floralia*), when a solemn procession proceeded to that area. Two shrine buildings also came to light during excavations. Water was led into the larger Eastern one while an altar dedicated to Iupiter came to light by its entrance.

In the Late Roman Period (4th century AD) the springs in the territory of the Római Strandfürdő were encircled by a castle-wall. Later, after the end of the Roman Empire, the conduits – lacking care and maintenance – became dilapidated, a marsh and later a lake developed in the territory. People from later times, however, continuously exploited the water of the springs: in the Migration Period there were houses erected on poles in the territory. Under the rule of King Matthias Corvinus (1458–1490), a hospital was built there, while later from 1872, a powder mill made use of the lake. In the 19th century, the famous Tóvendéglő was built over the ruins of this mill.

Picture 60. Section of a Roman Period canal made of limestone in the area of the Római Strandfürdő

Picture 61. An altar dedicated to Jupiter found *in situ*, from the so-called shrine in the area of the Római Strandfürdő

Even today, the water of the springs providing water to the open-bath is still not potable and has an average degree of temperature 20–22 C°. Soil samples taken from the territory corroborated the observation made during excavations that the water from the springs had a high calcareous content which resulted in calcareous precipitations in the layers.

6.2. Roman Period brick kilns in Budaújlak

Besides the study of the territory of the Civil Town and of the fortress – Military Town, the investigation of those territories situated to their Southfell somewhat into the background. During last years, however, more and more new prospects have opened up providing the opportunity to gain wider knowledge on the past in this latter area as well. As the result of rescue excavations (FACSÁDY 1999/1, FACSÁDY – KÁRPÁTY 2001) preceding the increasingly frequent construction projects at Budaújlak, the topography of the territory as well as the changes in the way it was utilized during the Roman Period became increasingly well understood. In addition to its Roman antecedents, the lots of the cemetery used over periods and containing both cremation and inhumation could be clearly traced (*Figure 17)* along present-day Bécsi Road beginning at Zsigmond Square.

One of the fundamental changes in the function of the territory became obvious during excavation on lots at 12 Bécsi Road–11 Ürömi Street (FACSÁDY 1997/1).[143] In the Eastern part of the lot, along present-day Bécsi Road and just a bit removed from it, a North–South running

[143] A pottery kiln with a very rich assemblage of finds came to light not far from here, beneath 4–6 Ürömi Street, R. Facsády A. – Kárpáti Z.: Ásjel. Bp. II, 4–6 Ürömi Street. Hrsz.: 14952.Aqfüz 11 (2004) 212–213.

road came to light in addition to remains of a Late Roman Period industrial settlement (*Figure 32. 15*) found in the part of the lot that extended onto the slope of the hill along Ürömi Street. The modern street fixed the limits of these investigations so that the entire settlement could not be excavated. Two kilns and the partly covered working pits belonging to them as well as one of the pits originally used as a clay extraction pit and later filled up with production waste, fell within the area of the excavation. Determining the exact extent of the industrial settlement itself would require further excavation work although it is known that it spread over on the steeper part of the slope of the hill along the street.

The two kilns excavated date to the same period and have identical cross-sections. Only one of them could be excavated completely, revealing its full beauty. They represent the generally widespread (CUOMO di CAPRIO 1978–1979. type IIc) almost quadratic form of Roman Period brick kilns (*Picture 2*). The Northern part of the plastered kiln was cut into the soil of the hill-side. The mouth of its protruding firebox was on the Southern, longitudinal side while its constructed mouth where the unbaked clay bricks were placed in the kiln to be fired was on its Eastern side with a half-covered working pit in front of it.

The plaster of the kiln walls was renovated several times. Its grate is fully preserved and has internal dimensions of 3.2 x 2.4 m. The dimensions of the other kiln are unknown since it could not be excavated because of the ground conditions. The Northern side of this kiln was constructed and surfaced with bricks. Its grate was situated in a vaulted sub-structure but its mouth lay outside the lot.

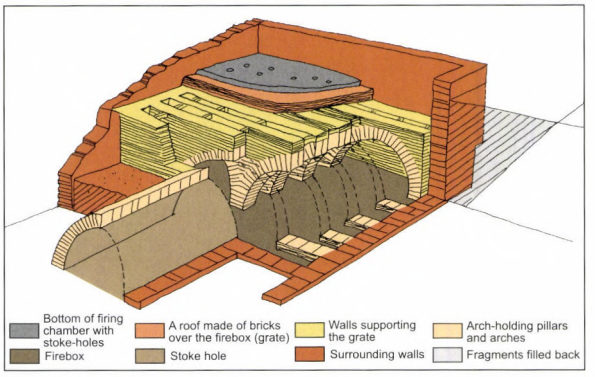


Fig. 46. Reconstruction of a Roman Period brick kiln excavated at Óbuda (drawn by Anikó Kovács, after Csaba Bende)

A large quantity of brick fragments, malformed and over-fired pieces were found in the kilns and in their proximity. In the Roman Period the height of the territory differed considerably from today, the original soil level may have been at a higher altitude on the hill slope.

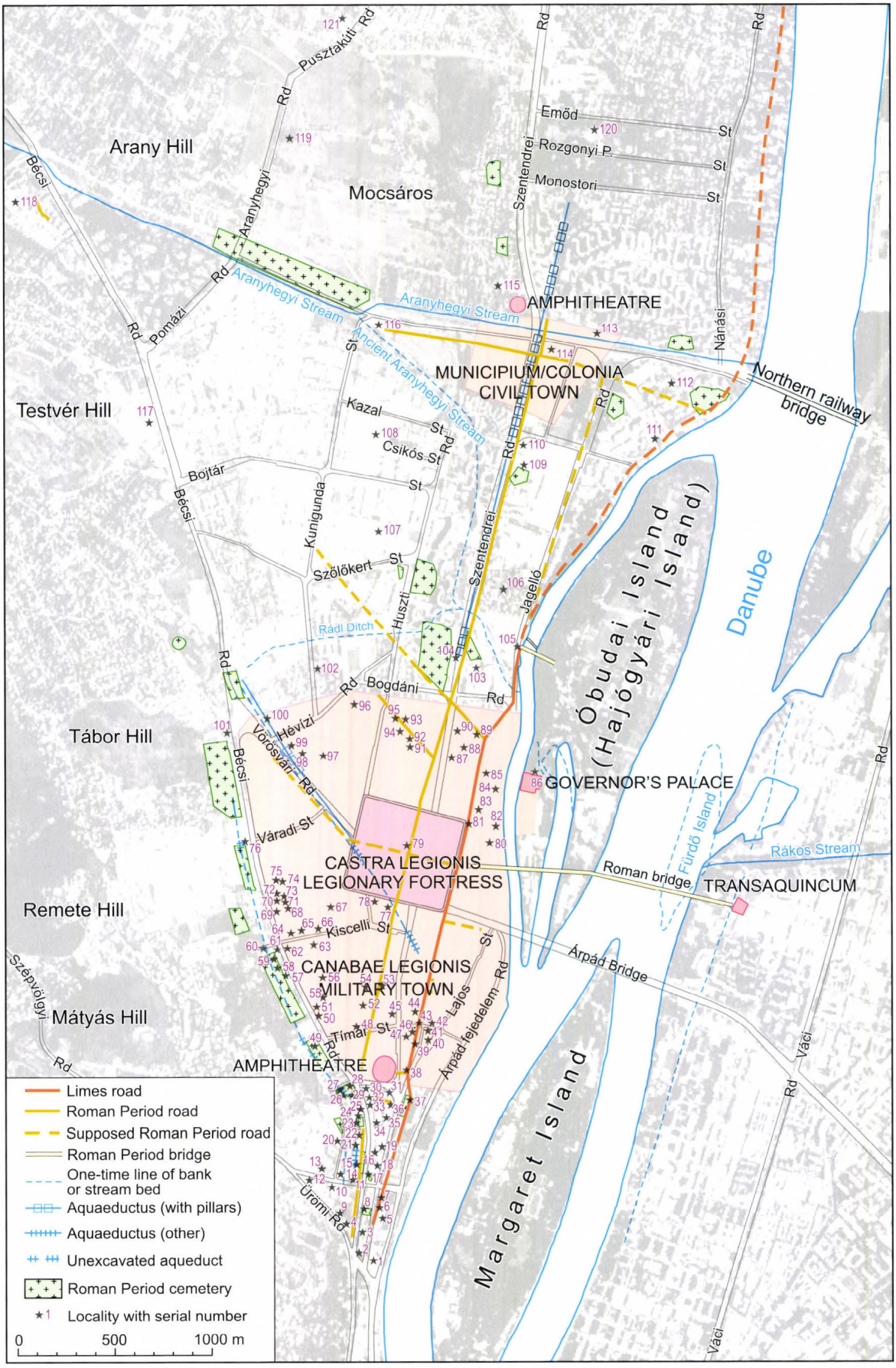
The clay found all along Bécsi Road proved an excellent raw material of pottery-making and of brick-making. Therefore it is not mere chance that potters' workshops and brick-making workshops already existed in the territory in the Roman Period. (In modern times, as well, several brick-making workshops and brick-works operated here). The inhabitants in the territory in the Roman Period – both civilians and the army – used many ceramic goods for cooking, serving, "packing" and in construction work. The brick-making workshop of the legion came to light on lot 124–128 Bécsi Road (PARRAGI 1976/2, *Figures 17, 46, 47).*

Brick kilns were usually constructed according to the plan described above, with a vaulted, single firebox or with one divided into two sections with a quadratic ground-plan (LŐRINCZ 1981). They utilized the conditions of the terrain as far as possible. The mouth of the firebox and that of the firing chamber were on different sides. The construction of the pottery kilns is similar, but they had usually a pyriform shape. The kilns, dating to various Roman phases operated only in certain periods for short times, producing ware with characteristic shapes and decorations, particular to a given workshop (PÓCZY – ZSIDI 1992).

The vault of the brick firebox contained the grate, on which the ware to be fired was placed. The vertical wall of the kiln – if the clay from the hill-side was not utilized – was built of bricks that were quite frequently burnt through only during operation. Workshops presenting a danger of fire were located at farther points in the settlements, separated from the dwellings although obviously the proximity of good quality clay-fields was also considered when their place was chosen (*Figure 46*).

→

Fig. 47. Archaeological localities of high priority mentioned in the text and represented in figures (Katalin H. Kérdő – Anikó Kovács). – 1 = Zsigmond Square 5–7; 2 = Ürömi Street 2–4; 3 = Cserfa Street–Bécsi Road 1–3–Lajos Street 2–4; 4 = Lajos Street 4–6–Cserfa Street–Bécsi Road 3–8; 5 = Lajos Street 23–31; 6 = Lajos Street 29–31; 7 = Lajos Street 35; 8 = Bécsi Road 25; 9 = Ürömi Road 11–Bécsi Road 12; 10 = Szépvölgyi Road 18–22; 11 = Kolosy Square 6; 12 = Szépvölgyi Road 39–42; 13 = Szépvölgyi Road 41; 14 =` Szépvölgyi Road 15; 15 = Bécsi Road 34–44; 16 = Bécsi Road 57–61; 17 = Kolosy Square 4; 18 = Csemete Street 1; 19 = Lajos Street 46; 20 = Csemete Street 2–6; 21 = Bécsi Road 46–52; 22 = Bécsi Road 54–56; 23 = Bécsi Road 60–62; 24 = Bécsi Road 64; 25 = Bécsi Road 66; 26 = Kecske Street 25; 27 = Kecske Street 29; 28 = Bécsi Road 82–86; 29 = Bécsi Road 80; 30 = Bokor Street 21–25; 31 = Lajos Street 76–84; 32 = Bokor Street 9–19; 33 = Bokor Street 1–5; 34 = Bécsi Road 63–71; 35 = Lajos Street 48–64; 36 = Lajos Street 74; 37 = Lajos Street 71–89; 38 = Pacsirtamező Street 3–11/a; 39 = Fényes A. Street 4; 40 = Lajos Street 112; 41 = Lajos Street 118–120; 42 = Lajos Street 122; 43 = Timár Street, roadway, 44 = corner of Timár Street and Fényes A. Street (Police); 45 = Pacsirtamező Street 30; 46 = Fényes A. Street 6–8; 47 = Pacsirtamező Street 19; 48 = Timár Street 21; 49 = Bécsi Road 96/b; 50 = Bécsi Road 123; 51 = Bécsi Road 127; 52 = Szőlő Street 22; 53= Dévai Biró M. Square 25–26; 54 = Selmeci Street 8–10; 55 = Selmeci Street 34; 56 = San Marco Street 48–50; 57= Bécsi Road 120; 58 = Bécsi Road 122; 59 = Bécsi Road 124; 60 = Kiscelli Street 98; 61= Bécsi Road 126–128; 62 = Bécsi Road 167; 63 = Kiscelli Street 74; 64 = Kiscelli Street 77–79; 65 = Kiscelli Street 75; 66 = Kiscelli Street 73; 67 = Zápor Street 56–64 (district heating works); 68 = Föld Street 54; 69 = Bécsi Road 181–185; 70 = Vályog Street 4–Bécsi Road 189; 71 = Vályog Street 1; 72 = Vályog Street 8; 73 = Vályog Street 3; 74 = Vályog Street 13; 75 = Vályog Street 14; 76 = corner of Bécsi Road and Váradi Street, northwestern side; 77 = Szőlőkert Street; 78 = Szőlő Street 70–74; 79 = Flórián Square and its neighbourhood castra legionis; 80 = Laktanya Street 19–21; 81 = Harrer P. Street 12–24; 82 = Laktanya Street 27–Kő Street–Óbudai Quay 43; 83 = Laktanya Street 14–34; 84 = Laktanya Street 31–33; 85 = Sorompó Street 2; 86 = Hajógyári Island, Governor's palace from the Roman Period; 87 = Búvár Street; 88 = Folyamőr Street 14–16; 89 = Folyamőr Street, Distillery; 90 = Folyamőr Street 14–16–Búvár Street 16; 91 = Szél Street 33; 92 = Szél Street 32; 93 = corner of Meggyfa Street and Szél Street; 94 = corner of Szél Street and Szellő Street; 95 = Meggyfa Street 19–21; 96 = Berend Street, building 2/VI; 97 = Hunor Street 21; 98 = Hunor Street 24–26–Vörösvári Road 95; 99 = Vörösvári Road 103–105; 100 = Vörösvári Road 111–117; 101 = Bécsi Road 166; 102 = Kunigunda Street 39; 103 = Ladik Street; 104 = environs of Filatorigát, Kaszásdűlő – Raktárrét; 105 = Óbudai Quay, Roman Period bridge-head; 106 = Benedek Elek Street; 107= Szőlőkert Street 6; 108= Kaszásdűlő – Csikós Street, 109 = Former prefabrication plant (Szentendrei Road); 110 = Schütz restaurant; 111 = Gas Factory, flats of civil servants; 112 = Gas Factory, Graphisoft Park; 113 = Papföld; 114 = Aquincum, Civil Town; 115 = Zsófia Street 7; 116 = Kiln along the Arany Ditch (Lókórház); 117 = Testvér Hill, Eastern slope; 118 = Testvér Hill; 119 = Mocsárosdűlő; 120 = Rozgonyi Piroska Street 2. (Rómaifürdő); 121 = Pusztakúti Road (Csillaghegy)


Arany Hill
Mocsáros
Testvér Hill
Tábor Hill
Remete Hill
Mátyás Hill
AMPHITHEATRE
MUNICIPIUM/COLONIA CIVIL TOWN
GOVERNOR'S PALACE
CASTRA LEGIONIS LEGIONARY FORTRESS
CANABAE LEGIONIS MILITARY TOWN
AMPHITHEATRE
TRANSAQUINCUM
Roman bridge
Northern railway bridge
Árpád Bridge
Óbudai Island (Hajógyári Island)
Margaret Island
Fürdő Island
Danube
Aranyhegyi Stream
Ancient Aranyhegyi Stream
Rádl Ditch
Rákos Stream
Limes road
Roman Period road
Supposed Roman Period road
Roman Period bridge
One-time line of bank or stream bed
Aquaeductus (with pillars)
Aquaeductus (other)
Unexcavated aqueduct
Roman Period cemetery
Locality with serial number
0
500
1000 m

7. Traces reflecting environment transformations from the Roman Period

Based on what is known at present, the Romans who settled in the territory of what was later the Hungarian capital city, were the first to make significant attempts to transform the environment. Certainly, they had to carry out considerable landscape transformation to create a territory to meet their needs. Most importantly, it was necessary to drain off water from the natural streams and water-courses running across the territory. In this respect, in addition to the waters from the Aranyhegyi Stream the water from the Római Stream, transporting the overflow of the springs, should also be considered. The North–South flow of the latter waterway, based on data from the first maps [144] – turns at right angle (!) to the East just along the line of the Northern town wall of the Civil Town, towards the Danube (*Picture 62*).

A system of channels leading out from the town was found in the same place during excavations. Passing round the Northern gate of the town, it passed through the town wall, draining its content into the *fossa*.[145] Thus, its path attests that the ditches belonging to the defensive works of the town and following the walls of the town in the North and South, definitely served as channels used to drain-off water. Apart from the above-mentioned facts, this is also suggested by the *fossa* (ditch) running across the South-Eastern part of the town, the direction of which differs considerably from that of the network of town streets of the. After the *fossa* was filled up later, drainage needs were accommodated by a deep channel, paved with stone (ZSIDI 1995/1, 44–46). Maybe another "irregularity" in the known topography of the town can be connected to similar factorsas well.

Namely excavations made in the East, at the meeting point of streets "E–F" *(Figure 18)* attested to the existence of an early ditch in the vicinity.[146] Furthermore, considerable differences in this system comprising the otherwise rectangular network of channels in the town can be experienced at exactly these two points mentioned above.[147] These water channels are certainly connected to the earliest system of the topography of the town, from a time preceding the creation of the regular network of streets in the town when its boundaries were surveyed and established. During excavations of past years, traces were also found in the Western part of the town associated with the filling up of lower-lying, waterlogged areas, more or less, in the place where the earlier hydrological reconstruction also suggested the existence of a lower-lying, watered-logged territory. Based on observations during excavation, the building-over of these territories was not as intensive in later periods, either (ZSIDI 1993).

Obviously, the former landscape relief influenced not only the topography of the first period of occupation, which can be discerned only in the form of ditches, but also on the later building-over of the town. The exploitation of the geographic situation can be traced as a background among other factors in the choice of the location of the *mithraeum. (Figure 18.* 18, 23) that appeared in the 2nd–3rd century AD town. That is, because of their cave-like construction, the slope of the terrain East of the aqueduct towards the Danube was taken advantage of.

Compared with the practice of earlier periods, in the Roman Period the environment was exploited much more intensively, including the harnessing and use of springs abounding in water. Archaeological excavations in the last years attested to the Roman use of several springs which are still active even today. During the excavation of the group of springs serving as the starting point of the Aquincum aqueduct, the harnessing of about 16 springs could be observed and documented (PÓCZY 1972, 15–32, LÁNG 2001, 2002/2). In addition, the water of the springs in present-day Csillaghegy in the vicinity of the Civil Town was certainly utilized

[144] Among others "Buda egész területének határtérképe, 1770 körül" (Map of the whole territory of Buda from ca. 1700) HOLLÓ 1994, 18–19, No 5. or C.P. Vasques "Pest–Buda–Óbuda térképe 4 szelvényen 1837"("Pest–Buda–Óbuda map in sector 4 from 1837") and. 34–35, No 10. See also picture 20 and *Fig. 22* in this volume.

[145] ZSIDI 1987, P. Zsidi's excavation in 1986. Unpublished ÁsJel RégFüz I. 1/40 (1987) 38–39, No 72/3 Pók u. Krempl malom = FORSCHUNGEN 337, No. 44.

[146] The moat from the Flavian Period MADARASSY 1991/4, 1991/5.

[147] PÓCZY 1980 113, *Fig. 115.*

Picture 62. The map of the whole territory of Buda with landmarks about 1770 (BTM Kiscelli Museum, Collection of maps)

as well (PETŐ 1976/1). Another example of the way the natural resources of the territory were exploited is the quarrying of the good quality limestone and tuff from the neighbouring hills. The quarries at Budakalász, on Ezüst Hill and farther to the South on Gellért Hill left enduring marks on the landscape that may still be seen today (TORMA 1984, PETŐ 1998 123–126).

Recent excavations also revealed signs of disasters as well as the remains of constructions created to protect against natural catastrophes in Aquincum. The Civil Town was always under the threat from regular flooding on the Danube. Although without targeted investigations no positive proof of such occurrences exists for the time being, proof of a kind has come from the legionary fortress (KOCSIS 1991) and from the Military Town as well (KÉRDŐ 1997/3). It may be that the rise in ground levels observed in the town could in part be attributed flood hazards. Moreover, later sources too, corroborate that floods in the Roman Period were real dangers and the territory of the Civil Town was a particularly vulnerable area. In the 19th century, a map was published representing the flood devastations that caused considerable damage to Óbuda as well. That is why territories exposed to danger, especially the former Civil Town, remained empty even following the Roman Period[148] and resettlement in these parts started began after completion of flood-control works including the building of flood protection dikes had been completed in the second half of the 19th century.

The prevention of the hazards caused by repeated inundations, as well as the safety of the settlement, made it necessary to create some sort of river control thus explaining the build-up of the bank of the Danube in the Roman Period. It is believed that traces of such a system were found in the remains of that post-construction system that came to light recently in the section of river bank near the Civil Town. This construction followed the present-day line of the Danube although it was situated around 50–80 m to its West (ZSIDI 1999/1, see also chapter 5.1, *Figure 19*).

[148] There were only a very few buildings on the outskirts of Óbuda: GÁL 1995.

8. The role of geographic conditions in the settlement history of Aquincum

Generally, geographic conditions played only a partial role in the development of settlements in the Roman Period where political and strategic factors were of primary importance. It was already the aim of imperial politics in the Augustan Period to create a riverine frontier (*ripa*) in the North. This partly separated the Roman Empire from the Barbaricum and partly it served as a secure trade connection between the *provinciae* situated along the river, making possible the provisioning of the army and civilians alike. Along great rivers, thus, also along the Danube and the Rhine, the system of fortified places (a chain of military forts) was established based on a standardized concept. The first links of this chain in Pannonia were created during the reign of Emperor *Claudius* (AD 41–54). These forts were established at the entrances of valleys, at the extreme points on roads leading from the inner parts of the province up to the line of the Danube. The defensive line along the Danube itself, including also roads, was built up under the *Flavian* emperors (AD 69–96). The *limes* received its final form under the rule of the Emperor *Traianus* (AD 98–117).

In later times, because of repeated assaults by the Barbarians, alterations and repairs important from the strategic viewpoint were definitely carried out at certain forts although the basic defensive concept remained unchanged. The building-up of the chain of watch-towers in the age of *Commodus* (AD 180–192) and later the Late Roman Period constructions of forts under the rule of *Valentinianus* (AD 364–375) required essential changes. These changes, however, were connected to changes in the political and strategic concept which took place everywhere in the Roman Empire. Within this concept, defence and warding off the ever increasing pressure of Barbarian peoples on the frontiers played a fundamental role.

Strategic and trade were predominant factors in the establishment of the road network as well, playing a decisive role in the development of the settlement structure (*Figures 16* and *17*). In the 1st century AD, forts were established at time of the Roman occupation at the extreme points of roads leading into valleys, at the valley entrances.[149] These were suitable places for *auxiliaris* forts, constructed to a standard pattern. These forts held a smaller permanent staff (500 persons) whilesettlements of civilians (*vici*) were founded around them. The main road which connected them – the so-called *limes* road – was gradually constructed to secure connections between the forts.

Aquincum and its wider environs represent a good example of the dynamic interaction between these stategic-political factors and environmental conditions in which these influences had an ever changing importance over time. The earliest military fort was established in the Víziváros. At the end of the 1st century AD, when a legion was commanded to come to Aquincum, the centre was relocated to the neighbourhood of present-day Flórián Square. In this case, it was definitely environmental factors that influenced the choice of place. Namely, the place of the fort in the Víziváros had already proved too small to accommodate a legionary fortress manned by 6,000 troops as well as the *canabae* surrounding it. There was enough room for the fortress of the legion and the *canabae* in the neighbourhood of present-day Árpád Bridge even with the presence of the *auxiliaris* fort already standing there. At the same time, the ford there had was of almost equal significance in the choice of location.

The islands in the Danube along the section of the river between the military fortress and the Civil Town provided an excellent place for watch-towers and bridges. The former served both to keep an eye on Barbarian peoples and to communicate with the forts in the left bank. The bridge leading toward *Transaquincum* also played a significant role in trade contacts with the Barbaricum.

At the same time, the location of the Civil Town was not determined primarily by environmental factors when it was established 2 km from the legionary fortress and its *territorium*.

[149] Due to the manner of representation, the lines of the valleys and those of the roads running within them are conspicuous on the map from 1873 *(Picture 53)*. Roman troops, marched along them from the inner part of the province towards the line of the Danube.

Thus, the main locational factors was the presence of the fortress and its surrounding areas. Roman construction principles predominated in the formation of road network in the fortress and the Civil Town. On the other hand, the road network of the *canabae*, due to its character and topographic position, only partly followed that regular, rectangular system found with the roads of the legionary fortress and the Civil Town. Instead the roads sensitively followed the long-distance road network of and the directions of the fortress roads. Environmental conditions were considered for construction of roads running outside settlements if necessary. The North–South oriented main road connecting the Military Town and the Civil Town ran along the ridge of a hill. The *limes* road followed the ground relief although its line was broken in the vicinity of the military amphitheatre. Swampy areas did not pose an obstacle. In such wet territories the roads were built on pole foundations – as observed in several places during excavations (e.g Budaújlak and the Mocsárosdűlő villa estate). The rectilinear road system marked out by surveying engineers generally characterised Roman Period road constructions.

The regular division of the land into lots and surveyed establishment of town boundaries (*limitatio*), beside the road network, played a decisive role in the building-up of the villa district of Aquincum (ZSIDI 2005, 337). At the same time, a Roman Period villa (Mocsárosdűlő) was recently excavated in a territory where earlier research had reckoned Roman Period constructions were not present. Here, it was observed that the villa building was situated on minor elevations in the otherwise waterlogged area.

As already mentioned, fords across rivers played important roles among the natural factors influencing location choices. These fords also determined the location choice for left bank forts as certainly attested for *Transaquincum*. Watch-towers on the tips of islands are another indication of the way fording places were exploited. These places were also chosen as places to build bridges along the Danube between the Civil Town, the *canabae* and Óbudai Island as well as between the Buda and Pest sides of the river.

In terms of the exploitation of natural resources, spring water was of primary importance – as already mentioned from several points of view in this volume. In the Roman Period, neither military forts nor civilian settlements could survive without a well-developed network of aqueducts and channels and baths. The direction of the main branches of the aqueducts, in accordance with the high level of engineering of the age followed an unobstructed path dictated by the direction of the main roads. The two aqueducts with pillars came to the Military Town from two different directions (*Figure 63*). The warm, thermal water, coming from the North, supplied water for the baths of the Civil Town, the Military Town and the legionary fortress. At the same time, the other water conduit transported water only to the Military Town from the North-West from springs emerging at the foot of the Buda Hills. This water was most probably primarily used for drinking. New sections of this latter aqueduct came to light recently at the meeting point of Bécsi Road and Vörösvári Road (KIRCHHOF 2009/3). The aqueduct forked out into ceramic pipes within walls.

Pipes with a similar construction were found in the territory of the Military Town in

Picture 63. Remains of an aqueduct with twin tubes led inside a wall in the Military Town

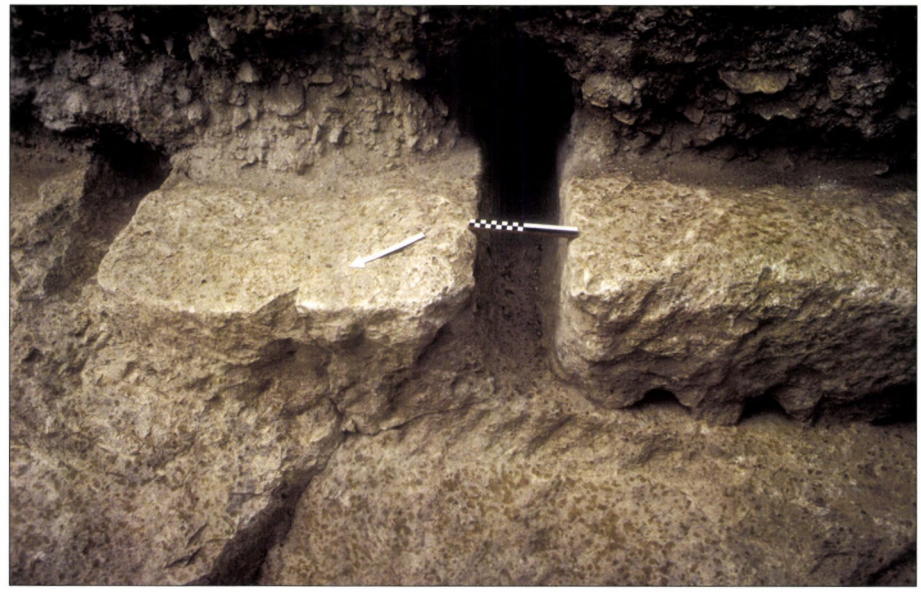
several places, frequently running parallel to each other. At present, there is not enough data to reconstruct the whole system.[150] The water from the same piedmont springs was also used in the workshops producing both household and industrial pottery in the industrial quarter lying on the Western edge of the Military Town. Long sections of that aqueduct, always running within the walls (where the water flowed either in trays or through ceramic pipes) on the Western side of Bécsi Road came to light during different excavations from Farkastorki Road as far as Szépvölgyi Road (*Figures 16* and *17*).

When the place for the industrial quarter producing ceramics was chosen, other important settlement factors included the nearby clay sources (Kiscelli Clay along Bécsi Road), something that does not hold true of the industrial workshops of the Civil Town. Since there was no problem with transport the location choice had more to do with trade possibilities. Thus, for the potters' settlement in the territory of the Gas Factory, most probably the nearness of the Danube and the harbour supposed to be there were the decisive location factors.

Stone (primarily limestone) necessary for construction and sculpture, especially grave steles, were quarried in several points in the Buda Hills, as suggested by mineralogical analysis.[151] Research carried out so far revealed the existence of Roman Period quarrying on Gellért Hill (*Picture 64*) and Ezüst Hill.[152] The provenance of the heat-retaining volcanic rock (basalt) used for the *hypocaustum* columns of floor-heating systems lies in the Visegrádi Hills.[153]

In the Roman Period it was a generally accepted requirement to consider climatic conditions during constructions – as attested by chapters in the book by Vitruvius written on architecture dealing with the orientation of the road network in towns or with the principles regarding the placing and layout of various buildings – to mention only the most important items.[154]

So far, it has only been possible to make scattered observations on floods in the Roman Period. Traces of such floods could be observed at the legionary fortress (KOCSIS 1991) and they were also sporadically documented in the territory of the building complex of the Governor's palace on Óbudai Island (KÉRDŐ 1997/3). The remains of the Roman Period embankment along the bank of the Danube by the Military and Civil Towns could be regarded as indirect proof of flood events (ZSIDI 1999/1, FACSÁDY – KÁRPÁTI 2001).



Picture 64. Traces of quarrying in a Roman Period stone quarry excavated on the Southern slope of the Gellért Hill.

[150] These localities are known mostly from excavation reports, data have not been collected on them so far (cf. footnote 72). Lately KIRCHHOF 2009/1, 2009/2.

[151] The results of the analyses carried out on the stone material from the Víziváros were displayed on a poster presented at the Conference on Archaeometry held in Aquincum in 1998. Unpublished results of analyses carried out by Pál Müller.

[152] PETŐ 1998, TORMA 1984.

[153] Result of the analysis made by Pál Müller, see note 134.

[154] VITRUVIUS, I. 6. : The direction of streets taking into consideration the winds. ibidem V. 10. The baths.

9. New evidence of the role of geographic elements in settlement history

(Data on the archaeological topography of the Southern part of the Óbuda Nagy Island)

Between 2007 and 2009, excavations took place on the Southern part of Hajógyári Island at Óbuda, in the territory of the former dockyard. [155] Although a, more or less, solid picture of the archaeological topography of Kis Island (*Figure 36*) could be derived from excavations[156] carried out till the end of the 1990s of the last century, the sites on Nagy Island were earlier almost completely unknown. A planned large investment permitted a survey primarily on the extent, position and archaeological character of the sites on the island. With these facts in hand it was then possible to begin systematic excavations. In the preparatory phase of the project the first test excavations were planned using data from old maps, the results of earlier excavations connected to the wider environs as well as by using the results of borings taken to study soil mechanics and those taken during geophysical surveys. Five new sites, clearly distinguishable from a spatial point of view as well, in 11 test trenches. These sites represent several archaeological periods from the Neolithic till the Late Middle Ages.[157]

Both historical maps and the results of earlier excavations suggested the presence of a terrain with a rather variegated relief, much more structured than the present one in the surveyed area. This variability was also corroborated by the paleogeographic and geomorphologic investigations carried out by the Geographical Research Institute of the Hungarian Academy of Sciences (*Figure 15*).[158] Further excavations have made this picture even clearer. The historical importance of geographic conditions, the role of which was earlier thought to be marginal, became evident.

Before the beginning of the excavations, it was expected that features appearing as points (e.g. watch-towers and bridge-heads) would be found as well as as track-like features (defensive lines, roads and bridges), dating mainly to the Roman Period and in lesser number to prehistoric periods. By working out the character of land use within the wider environs of the area as well in the Roman Period permitted recognition of some systematic connections.

During actual field-work, a new element became conspicuous that, given experiences during excavations, played a primary role in the natural geographic conditions on different parts of the island (identifying the overall character of the vegetation and fauna) and consequently also influenced the character of human settlement there as well as methods of land use.

In earlier periods the island was exposed to the current water levels and regime of the Danube to a much greater extent than nowadays. That is, the original, much more variegated and structured relief reflected the composition of areas that were almost permanently inundated, of those frequently or regularly inundated and of areas that were permanently free from water. This fundamentally determined and limited what land could be used. Beyond the parts of the area that were usable there was also the characteristic plant association of flood plain forests. Here, we were confronted with an artificially transformed landscape and therefore needed to discover and detect these connections, while for the people actually living in these areas in earlier periods the the confines of areas free from water and suitable for use, were self-evident.

As it was mentioned above briefly, clearly distinguishable concentrations archaeological features appeared in five parts of the area (*Figure 48*). From North to South they are as follows:

Site 1. A large prehistoric site representing several periods was found at the Northern end of the Hajógyári Island cove, on the gently sloping side of the former branch of the Danube branch. For the time being only a small part of it has been excavated. The character of the features and finds dating to the Neolithic, Late Copper Age and Early Bronze Age suggests this area was periodically occupied with populations returning from time to time. The main reason for settling on that spot was the presence of the river as an important source of nutriments and raw

[155] On the results of excavations lately HAVAS – TÓTH 2010.
[156] KÉRDŐ 2008 and by the same author in this volume 106–119.
[157] HAVAS 2008.
[158] SCHWEITZER *et al.* 2009, 30–31.

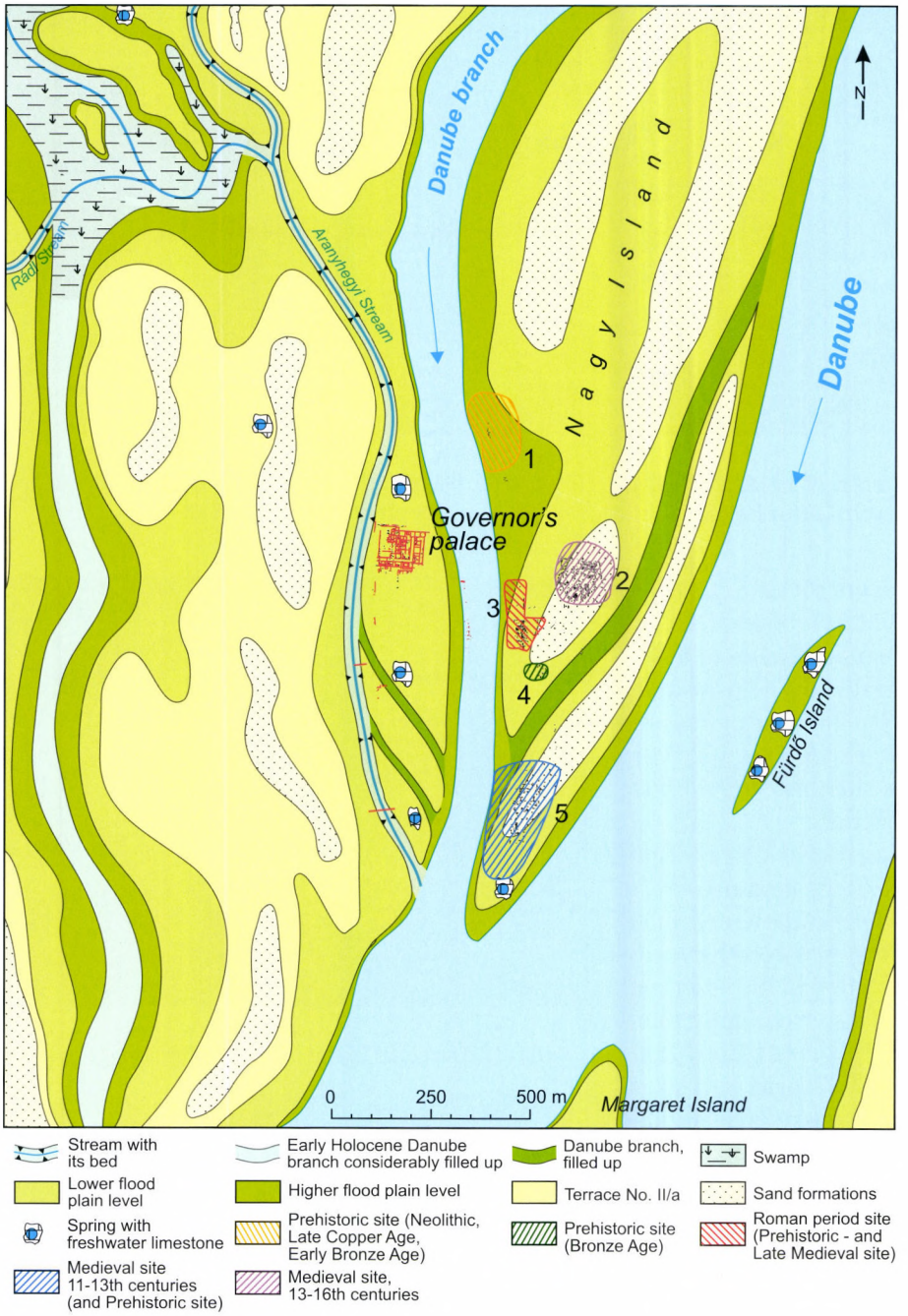


Fig. 48. Reconstructed geomorphological map of the Óbudai Island with the location of the archaeological sites (Ferenc Schweitzer – Katalin H. Kérdő – Zoltán Havas – Tibor Kovács – Anikó Kovács). – 1 = site 1. (Neolithic, Late Copper Age, Early Bronze Age); 2 = site 2. (Medieval, 13th–16th centuries, Prehistoric stray finds); 3 = site 3. (modern time, 16th–17th centuries, Medieval, 13th–16th centuries, Roman Period, Middle Copper Age); 4 = site 4. (Bronze Age); 5 = site 5. (Middle Copper Age, Medieval, 11th–13th centuries)

materials. In this respect, the site seems to fit into the chain of riverside settlements representing several prehistoric periods which flourished in the territory of Budapest and which are becoming better understood in increasing detail.

Site 2. The centre of a Medieval (13th–16th centuries) estate, which was almost enirely excavated. It occupied the Southern end of one of those North–South oriented sandy areas which run along the island (an Early Holocene point-bar[159]). The archaeological features from the economic centre of a large estate were not only restricted to a region above a certain geographic altitude but even its natural borders were reinforced by a more than 2 m wide and nearly 2 m deep ditch, encircling the centre (*Picture 65*). Some prehistoric finds also came to light at the site, although very sporadically.

Site 3. A significant part of this site was excavated and it yielded a variable find material. It lies on the Eastern side of the Hajógyári Island cove, opposite to the Southern part of the Roman Period Governor's palace. A small elevation within a wider, less intensively used area produced features during excavation from all archaeological periods are concentrated including Middle Copper Age, Roman Period, Late Middle Ages and Early Modern times (16th–17th centuries) although Roman Period fea-

[159] SCHWEITZER *et al.* 2009, 7–8.

Picture 65. Hajógyári Island. Centre of a Medieval estate in site 2. (Aerial photograph: Gábor Rákóczi)

Picture 66. Hajógyári Island. Roman Period ditches and rows of post-holes in site 3.

tures yielded the most coherent picture. However, it is difficult to adequately interpret these features. A system of somewhat irregular ditches of different depth as well as several rows of post-holes connected to the ditches show that use of this area was fraught with uncertainties (*Picture 66*). There were also some pits at the site (one was a refuse pit yielding a rich find material).

Site 4. Evidence was found of very sporadic and peripheric Bronze Age land use on the North-West side of an ancient and by now filled up Danube branch running in a North-North-East–South-South-West direction in the inner part of the island. This area was also frequently inundated after the Bronze Age (*Figures 14* and *15*).

Site 5. An Arpad Period rural settlement occupied the whole territory of the area suitable for human settlement on the Southern tip of Nagy Island. Most of it could be excavated (*Picture 67*). The Northern and Eastern natural borders of the site could be identified archaeologically. Here also the features of a Middle Copper Age settlement came to light although much less intensively than those from the medieval site.

In connection with the last-mentioned area the excavations produced an important negative result, namely: there was no sign of Roman land use in the form of finds or features in the profiles of archaeological layers of an area of several thousand square metres along a more than 300 m long contiguous North–South section. Due to the considerable fill in the area, soil layers deposited there earlier than the middle part of the 19th century were completely undisturbed. Nevertheless, apart from medieval and prehistoric features no remains of Roman

Picture 67. Hajógyári Island. Arpadian Age village in site 5.

Period roads, bridges or forts were found. Given what is known about the remains of a bridge documented on the former Fürdő Island[160] this experience at present represents an insoluble contradiction or at least raises serious doubts.

As is clear from the short description of the recently discovered sites, relief conditions, and other natural elements only permitted a much more restricted kind of land use in these archaeological periods than had been previously supposed. Within the island it was possible to recognize certain island-like parts suitable for use. These were most probably encircled by flood plain forests and by frequently inundated marshlands. In both time and space, the river had a primary influence on the possible role and significance of these parts of the island as regards

[160] NÉMETH 1999.

conditions for human settlement. However, during excavations, it was sometimes the archaeological features themselves, that is, the remains of human activity that proved to be more sensitive indicators of former natural conditions than the reconstructed relief conditions or the geographic and geological structures which could only be described on a larger scale.

When the results of our excavations carried out between 2007 and 2009 as well as those of the geomorphological observations made during these works are compared with what is known to date of the topography within a wider, historical context, at least as many questions are raised as resolved.

A completely new result, without antecedents, was the discovery of the Arpad Period settlement and the centre of the medieval estate. Not only does the simple existence of these features require them to be fit into the picture delineated by written and archaeological sources but perhaps it will also be necessary to answer certain questions as well. For example, why did the entrance of the centre of the estate open onto the main branch of the Danube (that is towards the Pest side)? Similarly, the analysis[161] of the numerous Roman Period stone monuments found at the two medieval sites and re-used several times, raises questions. Namely, why is there not a single piece among them that definitely came from the nearby Roman Period Governor's palace?

As for the Roman Period topography of the area, the already more detailed knowledge of the Eastern foreground of the Governor's palace, of its probable natural setting and character of the landscape character may force us to reconsider our thinking on the location choices connected to the palace itself, that is, we must reconsider the former explanations of what factors were considered when the place of the palace was chosen. Furthermore, neither must we avoid those questions connected to the fords on the river in the environs of Aquincum.

[161] HAVAS 2010.

Epilogue

A hypothesis which still needs to be confirmed: was a traditional flood-plain economy utilizing scow-channels utilized in the Roman Period?

During our joint research we tried to elucidate the nature of the contact between human beings in the Roman Period and natural conditions they found themselves in by addressing certain questions with the different means and ways of two branches of science.

The question raised on the side of geomorphology is whether some sort of traditional flood-plain economy using scow-channels, a method well-known from ethnography, was used also in the Roman Period (see chapter 2.3.2.).

We looked for an answer both in the works of ancient authors and in the results of excavations.

In his last poem, the poet Ovidius, sent into an exile to Tomi (today's Constanța in Romania) on the Black Sea coast, mentions the sturgeon wandering on the waves (*"peregrinis acipenser nobilis undis"*).[162] Some scholars believe that the fish mentioned here is the great sturgeon which on the waves of the Danube gets from the Black Sea for great distances (KÁDÁR 1984, 315). Another author, Claudius Aelianus, writing at the turn of the 2nd–3rd century AD writes that great sturgeon used to be fished out from under the ice in the lower Danube in winter.

The occurrence and fishing of this fish in the Danube section studied here is demonstrated by the survival of the geographic name "Vizafogó" ("where the great sturgeon is caught"), located near the mouth of the Rákos Stream. Another fish species native to this region is the sheath-fish, mentioned in an ancient poem. Ausonius, the *poeta doctus*, (AD 312–382) who was the tutor of Gratianus, son of Valentinianus I, in his poem entitled Mosella, wrote about the River Mosella (today the Mosel) flowing into the Rhine at Trier (*Augusta Treverorum*) and about the creatures living in it.

"Now, creature of the surface, shall thy praise be sung, o mighty sheath-fish, whom with back glistening as though with the olive-oil of Attica look on as a dolphin of the river so mightly thou glidest through the waters and canst scarce extend thy trailing body to its full length, hampered by shallows or by river-weeds"[163]

And a few lines afterwards he called it "the mild whale of the Mosel (*"mitis balena Mosellae"*). Interestingly, the bones of both species of fishes came to light in excavations in the territory of the Víziváros.[164]

Apart from hooks and more rarely fishing nets found during excavations, not much is known about fishing in Pannonia though these objects attest the existence of both fishing methods. It is also known that Romans regularly established fish-ponds.

Already Marcus Terentius Varro, the famous specialist of agriculture (116–127 BC) writes in his work (*Rerum rusticarum libri tres)* about fish-ponds. He distinguished two types of them:

„.... there are two kinds of fish-ponds, the fresh and the salt. The one is open to common folk and not unprofitable, where the Nymphs furnish the water for our domestic fish, the ponds of the nobility, however, filled with sea-water, for which only Neptune can furnish the fish as well as the water, appeal to the eye more than the purse, and exhaust the poach of the owner rather than to fill it. For in the first place they are built at great cost, and in the second place they are stocked at great cost and in the third place they are kept up at great cost. Our inland pond, which is for the common folk is porperly called „sweet" and the other „bitter" for who of us in not content with one such pond? Who, on the other hand, who starts with one of the seawater ponds doesn't go on to a row of them? For just as Pausias and the other painters of the same school have large boxes with compartments for keeping their pigments of different

[162] Halieutica – Piscatoria, line 132. On the kinds of sturgeons, their run up the Danube and their fishing in the Medieval Period: László Bartosiewicz – Clive Bonsall – Vasile Şişu: Sturgeon fishing in the middle and lower Danube region BAR International Series 1893, 2008., L. Bartosiewicz – C. Bonsall: Complementary taphonomies: Medieval sturgeons from Hungary. XIV ICAZ Fish remains working group meeting. Ed. APDCA, Antibes, 2008.

[163] Mosella 135-139, translated by H.G.E. White, http://archive.org./stream/deciausonius01ausonoft/djvu.txt

[164] Although not from a Roman Period layer but from Celtic levels. Alice Choyke drew attention to the find and here we express our thanks for it. According to her oral communication, besides the bones of the great sturgeon, bones of pike and sheath-fish also came to light. On fishing in the Roman Period: see Fisch und Fischer aus zwei Jahrtausenden. Hrsg. Heide Hüster Plogmann. FiA Band 39 Augst 2006.

colours, so these people have ponds with compartments for keeping the varieties of fish separate."

The example of two other fish-ponds, however, is even more interesting because he mentions the owner by name. "On the other hand, after Lucius Lucullus had cut through a mountain near Naples and let a storm of sea-water into his ponds, so that they ebbed and flowed, he had no need to yield to Neptune himself in the matter of fishing – for he seemed, because of the hot weather, to have led his beloved fish into cooler places... But when he was building near Baiae he became so enthusiastic that he allowed the architect to spend money as if it were his own, provided he would run a tunnel from his ponds into the sea and create a hole, so that the tide might run into the pond and back to the sea twice a day from the beginning of the moon until the next new moon, and cool off the ponds."[165]

In the territory of Hungary only the earthen and stone weirs of a few Roman Period fish-ponds are preserved, for example,. in the territory of Kikeritó, Öskü, Pátka and Balf. The extent of the fish-ponds at Balf was between 7.0–2.0 ha (MÓCSY 1990, 129, PÓCZY 1980, 93-95). Recently, the Roman Period connections to the artificial dike at Brigetio were studied by Friderika Horváth and István Viczián.[166]

Answering the question raised by Ferenc Schweitzer, that is, were there scow-channels in the Roman Period? Given the above-mentioned facts it can be stated that the possibility of their existence cannot at all be excluded. But where should the fish-ponds be looked for? The territory of the *prata legionis* (the pasture of the army) between the Military Town and the Civil Town had to be left empty. It is possible, however, that the ponds were located in the territory North of the Civil Town. Is it possible that those ditches with different dimensions[167] which were observed so often within the strip along the Danube in recent excavations – and the function of which is still unknown – could be connected with fish-ponds?

From this point of view a ditch, a longer section of which was excavated in the lots at 75–77 Nánási Road is especially interesting (VIRÁG 2009, 107–108). The side of the West North-West–East South-East running ditch was slightly curved. Its average width was 2.5–3.0 m and its average depth was 1.0–1.3 m. There are flared areas at several points on the Western side of the ditch. Towards the South-East it widened into a 11 m long and 5.8–6.0 m wide pit with a, more or less, flat bottom. Further on it narrowed again. Inevitably it calls to mind a description by Columella – an agriculture specialist ho lived in the 1st century AD "If the nature of the ground permits, channels should be provided for the water on each side of the fish-pond; for the old water is more easily carried away if there is an outlet on the side opposite to the one where the wave forces its way in."[168] (*Picture 68*).

This is only one of the questions with archaeological-historical implications which were raised as the result of cooperation between specialists in these two branches of sciences. We hope that our work will gain adherents not only for answering questions but also in opening up new questions.

Picture 68. One of the enigmatic ditches during the excavation (Budapest III, 75–77 Nánási Road)

[165] VARRO: III. 17. 2–4, 9.

[166] Horváth, F. – Viczián, I.: A római kori tájalakitás XVIII. századi következményei a Fényes-patak és az Által-ér Tata alatti szakaszának ártéri területein. (The XVIII century consequences of Roman Period soil formation in the area of the Fényes Stream area beneath Általér Tata floodplain area) In: Kázmér, M. (ed.): A Környezettörténet 2006. konferencia előadásainak összefoglalói. Az Általános Földtani Szemle Könyvtára 2. Budapest, 2006. 50–51. VICZIÁN – HORVÁTH 2006.

[167] Ditches and pits came to light to the North of the Civil Town, primarily in the excavations in the neighbourhood of Nánási Road. In several places, large North–South running ditches with a "V"-shaped cross-sections oriented parallel to the Danube, were observed. Their function was identified by the excavators – for want of a better idea – as drainage ditches. 5–7 Nánási Road /T. Láng O. Aqfüz 11 (2005) 211 etc./, Pók Street—Duna-part (banks)–Dunaparti Road /T. Láng O. Aqfüz 12 (2006) 65 etc.), Békásmegyer – Névtelen Street /Budai Balogh T. Aqfüz 12 (2006) 65 sk/. Their width was between 1.0–2.6 m and their depth ranged between 1.0–1.8 m.

[168] Columella XVII, 1. translated by H.B. Ash http://www.archive.org/stream/onagriculturewit02colu

Bibliography

ALFÖLDI A. 1940
A. Alföldi, Epigraphica III/1. *ArchÉrt* 53 (1940) 214–235.

ALFÖLDI A. 1943
Alföldi A., Aquincumi adalék a Kr.u. 268. év történetéhez. (Eine neue Angabe des Jahres 268. aus Aquincum. Res.) *BudRég* 13 (1943) 33–43. (Res. 489–493).

ALFÖLDI L. 1979
Alföldi L., Budapesti hévizek. (Thermal waters of Budapest) *VITUKI*, Budapest, 1979.

ALFÖLDY 1959
G. Alföldy, Die Truppenverteilung der Donaulegionen am Ende des I. Jahrhunderts. *ActaArchHung* 11 (1959) 113–141.

ALTMANN – DEBITZKY 1988
Altmann J. – Debitzky K., Budapest, III, Óbuda-Újlak. Corner of Lajos Street and Nagyszombat Street; block III/8. Lrn. 14660, 14661, 14663/4 (1988). Excavation documents (manuscript, BTM Data-Base 1580–89).

AUSONIUS
Decimus Magnus Ausonius, Mosella. Translated by H. G. E. White. http://archiveorg./stream/deciausonius01ausonoft/dju.txt

BARKÓCZI 1986
L. Barkóczi, *Pannonische Glasfunde in Ungarn.* Akadémia Kiadó, Budapest, 1986.

BERTALAN 1945
Bertalan V., A belvárosi plébániatemplom mellett folytatott ásatások 1944 nyarán. (Excavations at the Roman Camp of Pest in summer 1944. Res.) *BudRég* 14 (1945) 471–490.

Mrs V. BERTALAN 1973
Bertalan V.-né, Adatok Óbuda középkori helyrajzához. (Angaben zum mittelalterlichen Topographie von Óbuda. Res.) *BudRég* 23 (1973) 99–112.

Mrs V. BERTALAN 1976
Bertalan V-né, A középkor ásatások – kutatások története Óbudán (1850–1975). (The Investigation and Excavation History of the works of the History of Medieval Óbuda. Res.) *BudRég* 24 (1976) 31–40.

BERTIN 1996
P. Bertin, Preliminary report on excavation at 60 Bécsi Street. *Aqfüz* 2 (1996) 40–43.

BERTIN 1997
P. Bertin, Preliminary report on the excavations at the Budaújlak cemetery, Budapest District III, 38–42 Bécsi Street *Aqfüz* 3 (1997) 18–26.

BERTIN 1998
P. Bertin, Preliminary report on the rescue excavation carried out at 44 Bécsi Street. *Aqfüz* 4 (1998) 40–47.

BERTIN 1999
P. Bertin, Preliminary report on the excavation in the Southern section of the Bécsi Road cemetery, 45–60 Bécsi Street, District III, Budapest. *Aqfüz* 5 (1999) 26–36.

BÍRÓ 1985
Bíró J., *A magyar hajóépítés 150 éve.* (150 years of Hungarian boat-building) Budapest, 1985.

BÓKAI – KISS – MOCSY 1995
Bókai B. – Kiss Cs. – Mocsy F., Földtani és geográfiai áttekintés. (A geological and geographical outline.) In: *Óbuda évszázadai.* (Óbuda through the centuries) Budapest, 1995, 19–31.

BÓNIS 1947
Bónis É., A Bécsi úti kora római temető agyagedényei. [La ceramique du cimetière de la rue Bécsi de l'epoque romaine]. *AntHung* I. 1. (1947) 43–48.

BÓNIS 1993
É. Bónis, Töpferei an der Südmauer der Aquincumer Zivilstadt neben dem "Schütz-Gasthof". *BudRég* 30 (1993) 229–243.

BUDAI BALOGH 2007
T. Budai Balogh, Report on the excavation of new groups of graves in the Ladik Street cemetery (Budapest, III. 63–67 Szentendrei Road and 7–11 Ladik Street). *Aqfüz* 13 (2007) 88–101.

BUDAI BALOGH 2008
T. Budai Balogh, Investigations in the Northwestern zone of the Military Town. (Budapest, III., 103–105 Vörösvári Road). *Aqfüz* 14 (2008) 57–63.

BUDAI BALOGH – KIRCHHOF 2007
Budai Balogh T. – Kirchhof A., *ÁsJel.*, Budapest, III. ker., Vörösvári út 103–105., Hrsz.: 16916/2. [ER., Budapest, III., 103–105 Vörösvári Road.] *Aqfüz* 13 (2007) 259–261.

CHOLNOKY 1936
Cholnoky J., *Magyarország földrajza. A Föld és élete* I–IV. (Geography of Hungary. The Earth and its Life I–IV.) Franklin Társulat, Budapest, 1936.

COLUMELLA 2005
Lucius Iunius Moderatus Columella, De agricultura. Translated by H. B. Ash, http://www.archive.org./stream/onagriculturewit02colu.

CUOMO di CAPRIO 1978/1979
N. Cuomo di Caprio, Updraught pottery killns and tile killns in Italy in pre Roman and Roman times. *APA* 9/10 (1978/9) 23–31.

DEBITZKY 1991/1
Debitzky K., *ÁsJel.*, Budapest, III. Bécsi út 77–79. [ER., Budapest, III, 77–79 Bécsi Road.] *RégFüz* 1/43 (1991) 25, No 47/13a.

DEBITZKY 1991/2
Debitzky K., *ÁsJel.*, Budapest, III. Lajos u. 71–85. [ER., Budapest, III, 71–85 Lajos Street.] *RégFüz* 1/43 (1991) 26, No 47/17. see also **MÁRITY 1989.**

ERTEL 1999
Chr. Ertel, Zur Rekonstruktion der porta praetoria des Legionslagers Aquincum. In: *LIMES* 1997, 397–403.

FACSÁDY 1976/1
Facsády A., Előzetes jelentés a késő római kori erőd déli védműveinek feltárásáról. (Preliminary report on the excavation of the Southern defensive works of the Late Roman fort. Res.). *BudRég* 24 (1976) 145–149.

FACSÁDY 1976/2
R. Facsády A., *ÁsJel.*, Budapest, III. Lajos u. 152–158., 165. [ER., Budapest, III, 152–158 and 165 Lajos Street] *BudRég* 24 (1976) 408, No 18., No 22.
FACSÁDY 1977
R. Facsády A., *ÁsJel.*, Budapest, III. Lajos u. 172–174.–Óbuda u. 7. [ER., Budapest, III, 172–174 Lajos Street. – 7 Óbuda Street.] *RégFüz* 1/30 (1977) 19, No "B/6".
FACSÁDY 1980
R. Facsády A., *ÁsJel.*, Budapest III. Árpád fejedelem útja–Lajos u. Tanuló u.–Nád u. [ER., Budapest, III, Árpád fejedelem Road–Lajos Street–Tanuló Street–Nád Street.] *RégFüz* 1/33 (1980) 34, No 57/8., No 57/9.
FACSÁDY 1995
A, R. Facsády, Excavation in the Southern part of the Aquincum Military Town. *Aqfüz* 1 (1995) 32–34. [Budapest, III, 13–17 Dugovics T. Square].
FACSÁDY 1996/1
A, R. Facsády, Research on the Southern part of the Aquincum military territorium: Budaújlak (Budapest, District II) in the Roman Period (Bp. District II, 4–6 Lajos Street–Cserfa Street–3 Bécsi Road). *Aqfüz* 2 (1996) 14–21.
FACSÁDY 1996/2
Facsády A., *ÁsJel.*, Budapest, II. Lajos u. 26.–Sajka u. 4.–Bécsi út 25. [ER., Budapest, II, 26 Lajos Street–4 Sajka Street –25 Bécsi Road] *RégFüz* I/47 (1996) 35, No 49/8.
FACSÁDY 1997/1
A, R. Facsády, Industrial monuments in the Southwestern section of the Military Town. (Budapest District II, 12 Bécsi Street–11 Ürömi Street). *Aqfüz* 3 (1997) 14–17.
FACSÁDY 1997/2
A, R. Facsády, ER., Budapest District III, 39 Szépvölgyi Street. *Aqfüz* 3 (1997) 81.
FACSÁDY 1999/1
A, R. Facsády, New excavation of the cemetery in the Southern section of Budaújlak (Bp., District III, 25 Bécsi Street–26 Lajos Street–4 Sajka Street). *Aqfüz* 5 (1999) 20–25.
FACSÁDY 1999/2
A, R. Facsády, Rescue excavation in the Southern section of the so-called Bécsi Street Cemetery (Bp., District III, Farkastorki Street). *Aqfüz* 5 (1999) 95–98.
FACSÁDY 1999/3
A, R. Facsády, Excavations in the Southeastern area of the Aquincum Military Town, II. (Bp., District III, 13–17 Dugovics Titusz Square). *Aqfüz* 5 (1999) 65–76.
FACSÁDY 1999/4
A, R. Facsády, ER., Bp., District II, 18–22 Szépvölgyi Street. *Aqfüz* 5 (1999) 131–132.
FACSÁDY 2002/1
A, R. Facsády, ER., Excavation on the lot at Budapest II, 7 Felhévízi Street–31 Ürömi Street. *Aqfüz* 8. (2002) 136.
FACSÁDY 2002/2
A, R. Facsády, Excavations in the area of the so-called "Governor's villa" (Budapest III, 41 Szépvölgyi Street). *Aqfüz* 8 (2002) 15–20.
FACSÁDY 2003
A. R. Facsády, Herennius Etruscus basis in Budaújlak. In: *PANNONICA* 243–248. [Site: Budapest, II, 25–26 Lajos Street–4 Sajka Street, see also **FACSÁDY 1991/1**]
FACSÁDY 2004
A, R. Facsády, Excavation at a cemetery in Bécsi Road (Budapest III, 96/b Bécsi Road). *Aqfüz* 10 (2004) 21–29.
FACSÁDY – KÁRPÁTI 2001
A, R. Facsády, – Kárpáti Z., Early Roman settlement and remains of bank defence in the Southern part of Budaújlak (Budapest, III, 26–28 Árpád fejedelem Road–5–7 Zsigmond Square). *Aqfüz* 7 (2001) 14–20.
FITZ 1959
J. Fitz, Der Besuch des Septimius Severus in Pannonien im Jahre 202 u. Z. *ActaArchHung* 11 (1959) 237–263.
FITZ 1961–1962
J. Fitz, Titulum memoriae posuit. *Alba Regia* 2–3, (1961–1962), [1963], 33–48.
FITZ 1962
J., Fitz, A Military History of Pannonia from the Marcomannic Wars to the Death of Alexander Severus. *ActaArchHung* 14 (1962) 25–112.
FITZ 1971
J. Fitz, Angaben zu den Gebietsänderungen der Civitas Eraviscorum. *ActaArchHung* 23 (1971) 47–57.
FITZ 1978
J. Fitz, Grenzberechtigung im Jahre 214 zwischen Pannonia Superior und Inferior. *Alba Regia* 16 (1978) 71–86.
FITZ 1979
J. Fitz, Notes. *Alba Regia* 17 (1979) 353–356.
FITZ 1986
J. Fitz, Geschichtliche Probleme des Forums von Gorsium. *Oikumene* 5 (1986) 329–369.
FITZ 1989
J. Fitz, Prosopographische Bemerkungen zu den Inschriften aus dem Mithras-Heiligtum im Legionslager von Aquincum. *ActaArchHung* 41 (1989) 93–98.
FITZ 1990/1
J. Fitz, *La diretrice Emona-Aquincum. La Venetia nell'area Padano-Danubiana*. Padova, 1990, 337–348.
FITZ 1990/2
Fitz J., Művészet. (The art) In: *PRK*, 267–277.
FITZ 1993–1995
J. Fitz, Die Verwaltung Pannoniens in der Römerzeit I–IV, *Encyclopedia*, Budapest, 1993–1995.
FITZ 1999
Fitz J., Pannonia születése. (The birth of Pannonia) *MOYΣEYON*, Enciklopédia Kiadó, 1999.
FOERK 1923
Foerk E., Az óbudai aquaductus. (The aquaeduct in Óbuda) *BudRég* 10 (1923) 35–56.
FÜLEKY – MÁRITY 1998
Gy. Füleky – E. Márity, Environmental Changes in Budaújlak in the Roman Period. In: *TOWN*, 239–245.
GABLER 1971
D. Gabler, Die Eroberung Pannoniens im Spiegel der Sigillaten. *ActaArchHung* 23 (1971) 83–91.

GABLER 1977
Gabler D., A dunai limes I–II. századi történetének néhány kérdése. (Some remarks on the history of the Danubian limes of the first and second century. Res.) *ArchÉrt* 104 (1977) 145–175.
GABLER 1979
Gabler D., Pannonia megszállásának néhány kérdése a terra sigilláták tükrében. (Die Besitznahme Pannoniens in Spiegel des Sigillaten. Res.). *ArchÉrt* 106 (1979) 199–217.
GABLER 1997
D. Gabler, Early Roman occupation in the Pannonian Danube Bend. In: *LIMES* 1995, 85–92.
GABLER 1999
D. Gabler, The Flavian limes in the Danube-Bend (Eastern Pannonia). *CommArchHung* (1999) 75–82.
GABLER – VADAY 1986
D. Gabler – A. Vaday, *Terra Sigillata im Barbaricum zwischen Pannonien und Dazien*. Budapest, 1986.
GÁDOR – MÁRITY 1996
Gádor J. – Márity E., Budapest, *ÁsJel.*, III. Csemete u. 8–12. [ER. Budapest, III, 8–12 Csemete Street.] *Régfüz*1/47 (1996) 62, No 90/2.
GÁL 1995
Gál É., A török időktől a szabadságharcig. In: *Óbuda évszázadai*. (From the Turkish rule till the war of independence. In: Óbuda through the centuries) Budapest, 1995, 215–217.
GARÁDY 1938
Garády S., Az aquincum–brigetiói római út felkutatása az óbudai Aranyhegyi-árok mentén. (The research of the Roman Period Aquincum–Brigetio road along the Aranyhegyi Ditch in Óbuda.) In: *Laureae Aquincenses* I. (1938) 184–187.
GEDEON 1934
Gedeon T., A szulfátos vizek képződése.(The development of sulphurous waters) *Hidr. Közl.* 13 (1934) 100.
GÓCZÁN 1958
Góczán L., Budapest ősvízrajzi képe. (Paleohydrological scene of Budapest) In: *Budapest természeti képe* (The natural face of Budapest). (eds. Pécsi M. – Marosi S. – Szilárd J.) Akadémiai Kiadó, Budapest, 1958, 421–425.
GEREVICH 1976
Gerevich L., A pesti és budai vár. (The Pest and Buda Castles. Res.). *BudRég* 24 (1976) 43–58.
GRYNAEUS 2004
Grynaeus A., A magyarországi dendrokronológiai kutatás eredményei és új kérdései. (New problems and results in Hungarian dendrochronology research) In: "*Es tu scholaris*". Ünnepi tanulmányok Kubinyi András 75. születésnapjára.("*Es tu scholaris*". Commemorative studies for the 75th birthday of András Kubinyi) (eds. F. Romhányi B. – Grynaeus A. – Magyar K. – Végh A.) Budapest, 2004, 87–102.
GYÖRFFY 1955
Györffy Gy., Kurszán és Kurszán vára. (Kurzan und Kurzans Burg. Res.). *BudRég* 16 (1955) 9–40.
HABLE 1995
T. Hable, Research in Budaújlak, on the Southern edge of the Aquincum Military Town [Budapest, District III, 9, 11, 13–15, 17–19 Bokor Street] *Aqfüz* 1 (1995) 23–31.
HABLE 1996
T. Hable, Recent excavations in the proximity of the Aquincum Military amphitheatre. (Budapest District III, Lajos Street–Nagyszombat Street–III, 23–25 Bokor Street–60 Bécsi Street). *Aqfüz* 2 (1996) 29–39.
HABLE 1997/1
Hable T., *ÁsJel.*, Budapest, III., Kiscelli utca–Kiskorona utca. MATÁV akna. [ER. Budapest, District III, intersection of Kiscelli Street and Kiskorona Street. MATÁV trench]. *Aqfüz.* 3 (1997) 81–82.
HABLE 1997/2
Hable T., *ÁsJel.*, Budapest, III. Óbuda-Újlak, Bokor u.–Galagonya u. sarok. [ER. Budapest, III, Óbuda-Újlak, corner of Bokor Street–Galagonya Street.] *RégFüz* 1/48 (1997) 34. No 46/6; 35. No 51/5; 38. No 51/7.
HABLE 1999/1
T. Hable, An unusual find from the proximity of the military amphitheatre (Bp., District III, 21 Bokor Street). *Aqfüz* 5 (1999) 37–49.
HABLE 1999/2
Hable T., *ÁsJel.*, Budapest, III. Kecske u. 7. [ER. Bp. District III, 7 Kecske Street.] *Aqfüz* 5 (1999) 132–134.
HABLE 2000/1
T. Hable, Cemetery Segment on the Eastern Side of Bécsi Road (Budapet, District III, 4 Kolosy Square). *Aqfüz* 6 (2000) 14–19.
HABLE 2000/2
T. Hable, Recent Rescue Excavations South of the Nagyszombat Street Amphitheater (Budapest, District III, 74 Lajos Street). *Aqfüz* 6 (2000) 37–45.
HABLE 2002/1
Hable T., Óbuda-Újlak római kori topográfiájának vázlata. (Die Skizze der Römerzeitlichen Topographie von Óbuda-Újlak. Res.). *BudRég* 35/1 (2002) 267–278.
HABLE 2002/2
T. Hable, Some recently unearthed graves from the western cemetery of the Aquincum Military Town (Budapest III, 56 Bécsi Road). *Aqfüz* 8 (2002) 21–27.
HABLE 2003
T. Hable – L. Reményi – Z. Kárpáti, Two excavations in the Southern part of the Aquincum canabae (Budapest III, 71–89 Lajos Street). *Aqfüz* 9 (2003) 33–47.
HABLE – MÁRTON 2000
T. Hable – A. Márton, Graves and gravestones from the Bécsi Road Cemetery (Budapest, III, Western side of 48–50 Bécsi Road and Eastern side of 52 Bécsi Road). *Aqfüz* 6 (2000) 20–36.
HABLE – MÁRTON 2001
T. Hable – A. Márton, New graves from the Western cemetery of the Aquincum Military Town (Budapest, III, 62 and 80 Bécsi Road). *Aqfüz* 7 (2001) 21–37.
HAJNÓCZI 1971
Hajnóczi Gy., Az aquincumi katonai amfiteátrum kitűzése és szerkesztésmódja. (Location and construction style of the military amphitheatre at Aquincum. Res.) *ArchÉrt* 98 (1971) 186–189.

HAJNÓCZI 1987
Hajnóczi. Gy., *Pannónia római romjai.* (Pannonian Roman Ruins) Budapest, 1987.
HAJNÓCZI – MEZŐS 1995
Hajnóczi Gy. – Mezős T., *Itinerarium Hungaricum I. Pannonia Hungarica Antiqua.* Archeolingua, Budapest, 1995.
HALFMANN 1986
H. Halfmann, *Itinera principum.* Stuttgart, 1986.
HAMPEL 1891
Hampel J., Aquincumi temetők. 1881–1882. évi följegyzések alapján. (Aquincum cemeteries. Based on notes from 1881–1882) *BudRég* 3 (1891) 47–80.
HAUER 1867
K. Hauer, Die Springtherme der Margareten-Insel bei Pest, und Analyse der Quelle. *Verh. d.k.k.geol. R. Anst.*, Wien, 1867.
HAVAS 2008
Z. Havas, Test excavations on Óbuda (Dockyard) Island. (Budapest III, Óbuda Island, Lrn: 23798/1, 23798/3, 23796/7, 23796/8) *Aqfüz* 14, 2008, 24–39.
HAVAS 2010
Z. Havas, Die römischen Ergebnisse einer mittelalterlichen Ausgrabung – römische Spolien auf der Schiffswerft-Insel (Hajógyári-sziget) In: Vindobona-Aquincum. Herausforderungen und Ergebnisse in der Stadtarchäologie. (Reds. U. Stipanits – O. Láng) *Aquincum Nostrum* II 6. Budapest, 2010, 69–84.
HAVAS – TÓTH 2010
Z. Havas – A. Tóth, Excavations on Dockyard Island in Óbuda in 2009 (Budapest III, Óbuda Island, Lrn: 23798/1, 23798/3, 23796/7) *Aqfüz* 16, 2010, 68–85.
HEKLER 1908
Hekler A., Márványfej és bronzmaszk a Nemzeti Múzeumban. (Marble head and bronze mask in the National Museum) *ArchÉrt* 28 (1908) 231–238.
HOLLÓ 1994
Holló Sz. A., *Budapest régi térképeken 1686–1896.* (Budapest on old maps, 1686–1896) Officina Nova, Budapest, 1994.
HORLER 1962
Horler M., A II. kerület műemlékei. (Monuments of District II). In: *Budapest Műemlékei* II, (Budapest Monuments II.) Budapest, 1962, 157–311.
HORUSITZKY 1920
Horusitzky H., Budapest talajvizeiről. (On Budapest's soil waters) *Term. Tud. Közl.* 52 (1920) 743–746.
HORUSITZKY 1933
Horusitzky H., Budapest székesfőváros hidrogeológiai viszonyai. (Budapest capital city's hydrological situation) *Hidr. Közl.* 12 (1933) 19–45.
HORUSITZKY 1939
Horusitzky H., Budapest Duna jobbparti részének (Budának) hidrogeológiája. (The hydrology of Budapest's right bank [Buda] of the Danube) *Hidr. Közl.* 18 (1939) 1–404.
JANKOVICH 1963
Jankovich M., Újlak és Szentjakabfalva helyrajzi adatai az 1702. évi Zaiger tükrében. (Die topographischen Angaben von Újlak und Szentjakabfalva in Spiegel des Zaigers aus dem Jahre 1702. Res) *BudRég* 20 (1963) 155–164.
KABA 1955
Kaba M., Az aquincumi parancsnoksági épület belső dekorációja a Laktanya utcában. [Budapest, III, 31–33 Laktanya Street.] (Innere Dekoration des Kommandogebäudes von Aquincum in der Laktanyastrasse. Zusammenfassung.) *BudRég* 16 (1955) 255–293.
KABA 1958
Kaba M., Az aquincumi helytartói palota mozaikpadozata. (Die Mosaikfussboden des Statthalterpalastes von Aquincum. Res.) *BudRég* 18 (1958) 79–102.
KABA 1964
Kaba M. Újabb feliratos kő Aquincumból. (Ein neuer Inschriftstein aus Aquincum. Res.) *BudRég* 21 (1964) 247–251.
KABA 1976
Kaba M., Az aquincumi aquaeductus pilléreinek 1975. évi kutatása (Előzetes jelentés). (The 1975 excavation of the piers of the Aquincum aqueduct (Preliminary report). Res.). *BudRég* 24 (1976) 225–230.
KABA 1978
Kaba M., *ÁsJel.*, Óbudai Hajógyár-sziget. [ER. Óbudai Hajógyár Island.] *RégFüz* 1/31 (1978) 46, No "B"/25.
KABA 1986
M. Kaba, Die "Thermae maiores" in Aquincum. In: *LIMES* 1983, 336–340.
KABA 1991
M. Kaba, Thermae maiores legionis II adiutricis. (Deutscher Auszug p. 81–88.) *Monumenta Historica Budapestinensia* VII. Budapest, 1991.
KÁDÁR 1984
Kádár Z., Az élő természet. (Living nature) In: *Antik természettudomány.* (The Ancient Science) (eds. Szabó Á. – Kádár Z.) Gondolat, Budapest, 1984, 239–411.
KAISER – VARRÓ 1999
Kaiser A. – Varró J., Volt egyszer egy Hajógyár. (Once upon a time there was a boat factory) Budapest, III. kerület, Óbuda – Békásmegyer, *Helytörténeti Füzetek* III. No 1. (1999).
KÉRDŐ 1976
H. Kérdő K.,, Előzetes jelentés az aquincumi II–III. századi legiotábor déli, valamint a IV. századi erőd nyugati frontján végzett kutatásokról. (Preliminary report on the investigations conducted at the Southern front of the 2nd–3rd century fort in Aquincum. Res.) *BudRég* 24 (1976) 71–78.
KÉRDŐ 1982/1–3
H. Kérdő K.,, E *ÁsJel.*, *RégFüz* 1/35 (1982): p. 30. No 69/1. (Budapest, III. Árpád fejedelem útja – Kulcsár u. saroktól Ny-ra); p. 34. No 69/3. (Budapest, III, Lajos u. 160-tól keletre); p. 35. No 69/18. sz. (Budapest, III, Serfőző u. 2–12-től északra). [ER. *RégFüz 1/35* (1982): p. 30. No 69/1. (Budapest, III, Árpád fejedelem Road–West of the corner of Kulcsár Street); p. 34 No 69/3. (Budapest, III., East of 160 Lajos Street); p. 35. No 69/18. (Budapest, III, North of 2–12 Serfőző Street).]
KÉRDŐ 1985
H. Kérdő K.,, *ÁsJel.*, Budapest, III. Dugovics T. tér 2. [ER., Budapest, III, 2 Dugovics T. Square.] *RégFüz* I/38. (1985) 36. No 66/4.]

KÉRDŐ 1990
K, H. Kérdő, Forschungen im nördlichen Teil der Retentura des Legionslagers des 2–3. Jhs. von Aquincum in den Jahren 1983–1984. In: *LIMES* 1986, 703– 707.

KÉRDŐ 1997/1
K, H. Kérdő, Zur Frage der Lokalisierung des Auxiliarkastells von Víziváros (Wasserstadt) In: *LIMES* 1995, 399–404.

KÉRDŐ 1997/2
H. Kérdő K., Kutatások az aquincumi 2–3. századi legiotábor retenturájának északi részén, 1983–84-ben.(Research on the Northern part of the *retenture* of the Aquincum 2nd–3rd century legionary fortress) *BudRég* 31 (1997) 269–272. See KÉRDŐ 1990.

KÉRDŐ 1997/3
K, H. Kérdő, Test excavations at the Aquincum Governor's Palace on the Óbuda Hajógyári Island. *Aqfüz* 3 (1997) 27–39.

KÉRDŐ 1999/1
K, H. Kérdő, Die neuen Forschungen im Gebiet des Statthalterpalastes von Aquincum. In: *LIMES* 1997, 651–662.

KÉRDŐ 1999/2
K, H. Kérdő, Óbuda Hajógyári (Shipyard) – Island, District III, Budapest. *Aqfüz* 5 (1999) 138–141.

KÉRDŐ 2000
H. Kérdő K.,, Az aquincumi helytartói palota falfestményei: Állapotuk, a feldolgozás módszertani lehetőségei. (Die Fresken des Aquincumer Statthalterpalastes – Zusammenfassung. Res.) In: *Acta Archaeologica* Brigetionensia I, 1. Budapest–Komárom, 2000, 157–167.

KÉRDŐ 2002
H. Kérdő K.,, Az aquincumi helytartói palota. (The Governor's Palace in Aquincum) In: *Aelius Aristeidés: Róma magasztalása.* Fordítás és kísérő tanulmányok. (In Aelius Aristeides: The eulogy of Rome. Translation and attached papers) A Károli Gáspár Református Egyetem BTK Ókortörténeti Tanszékének Kiadványai II. 2. bővített és javított kiadás [revised and enlarged edition] Budapest, 2002, 269–280.

KÉRDŐ 2003/1
K, H. Kérdő, Der Statthalterpalast von Aquincum. In: *FORSCHUNGEN* 2003, 112–119.

KÉRDŐ 2003/2
K, H. Kérdő, Das Alenlager und Vicus der Víziváros. In: *FORSCHUNGEN* 2003, 81–84.

KÉRDŐ 2005
K, H. Kérdő, Die Anfänge von Aquincum und die Änderungen in der Siedlungsstruktur in Víziváros in den Jahrhunderten der Römerzeit. Archäologische Angaben zur Geschichte von Aquincum – Víziváros. In: *STÄDTE,* 83–99.

KÉRDŐ 2008
K, H. Kérdő, Der Statthalterpalast von Aquincum. In: *DOMUS,* 285–306.

KÉRDŐ – B. TÓTH 1981
H. Kérdő K. – B. Tóth Á., *ÁsJel.*, Budapest, III. Árpád fejedelem útja, Kulcsár u., Serfőző u., Lajos u., Korvin O. tér által határolt terület. *RégFüz* I/34 (1981) 27–28, No 55/2. [ER., Budapest, III, An area bordered by Árpád fejedelem Road, Kulcsár Street, Serfőző Street, Lajos Street, Korvin O. Square. RégFüz I/34 (1981) 27–28, No 55/2.]

KÉRDŐ – NÉMETH 1986
K, H. Kérdő – M. Németh, Zur Frage der Besatzung von Aquincum im 1. Jahrhundert. In: *LIMES* 1983, 384–388.

KÉRDŐ – NÉMETH 1993
Kérdő K. – Németh M., Aquincum 1. századi megszállásának kérdéséhez. (Zur Frage der Besetzung von Aquincum in 1 Jahrundert. Res.). *BudRég* 30 (1993) 47–59.

KÉRDŐ – TÓTH J. 2003
H. Kérdő K., – J. A. Tóth, Római kori rakpart maradványai a Hajógyári-öbölben. (Remains of Roman quay in the Hajógyári Cove) In: *Régészeti Értékeink* (Treasures of Archeology in Hungary. Res.) (ed. Nagy L.) no date

KÉRDŐ – TÓTH J. – NÉMETH – KIRCHHOF 2004
K, H. Kérdő – A, J. Tóth – M. Németh – A. Kirchhof, Archaeological investigations in the Hajógyári Cove (Budapest III, Óbuda Island, Hajógyári Cove). *Aqfüz* 10 (2004) 37–41.

KIKINDAI 2002
Kikindai A., *Aquincum – Mocsáros dűlői villa főépülete. [a villa pars urbana része].* (The main building of the Mocsárosdűlő villa [the pars urbana part of the villa]) Thesis. Archaeological Institute of the Eötvös Lóránd Tudományegyetem, Bölcsészettudományi Kar, Budapest, October 2002.

KIRCHHOF 2003
A. Kirchhof – L. Horváth, Archaeological investigations in the Western, industrial quarters in the Aquincum canabae (Budapest III, 75, 98 Kiscelli Street). *Aqfüz* 9 (2003) 53–64.

KIRCHHOF 2007
A. Kirchhof, New excavation results from the Northwestern region of the Military Town I. (Budapest, III, 111–117 Vörösvári Road, former REMIZ). *Aqfüz* 13 (2007) 40–56.

KIRCHHOF 2008
A. Kirchhof, ER., Budapest, III, 30 Pacsirtamező Street. *Aqfüz* 14 (2008) 184–185.

KIRCHHOF 2009/1
A. Kirchhof, Excavation Report. Budapest, III, 24–26 Hunor Street, 95 Vörösvári Road. *Aqfüz* 15 (2009) 44–61.

KIRCHHOF 2009/2
A. Kirchhof, ER., Budapest, III, 21 Hunor Street. *Aqfüz* 15 (2009) 173–174.

KIRCHHOF 2009/3
A. Kirchhof, The North-Western Region of the Aquincum Military Town. In: Vindobona – Aquincum. Probleme und Lösungen in der Stadtarchologie. (Red. P. Zsidi – O. Láng – A. Szu) *Aquincum Nostrum* II, 5 Budapest, 2009. 45–52.

KISS 1973
Á. Kiss, Roman Mosaics in Hungary. *FontArchHung* Budapest, 1973.

KISS 1987
Á. Kiss, *Pannonische Architektuelemente und Ornamentik in Ungarn.* Akadémia Kiadó, Budapest, 1987.

KOCSIS 1989
L. Kocsis, Inschriften aus dem Mithras-Heiligtum des Hauses des tribunus laticlavius im Legionslager von Aquincum aus dem 2–3. Jahrhundert. *ActaArchHung* 41 (1989) 81–92.
KOCSIS 1990
L. Kocsis, Zur Periodisierung des Hauses des tribunus laticlavius im Legionslager von Aquincum. In: *LIMES* 1986, 709–714.
KOCSIS 1991
Kocsis L., A Tribunus Laticlaviusok háza az aquincumi 2–3. sz.-i legiotáborban (Előzetes jelentés). (Das Haus der Tribuni Lacticlavii aus dem Legionslager von 2–3 Jh in Aquincum (Vorbericht). Res.). *BudRég* 28 (1991) 117–197.
KOPPÁNY 1981
Koppány Gy., Az éghajlat-ingadozások kutatásának módszerei, együttműködés különböző tudományágakkal. (Methods of the study of climatic oscillations, cooperation with different branches of science) *MTA X. Oszt. Közl.* 14 (1981) 193–207.
KOVÁCS 1996–1997
Kovács P., A "katonai territorium" és a veterani et cives Romani szervezet. (Das "Militrische Territorium"und die Organisation Veterani et cives Romani. Res.) *ArchÉrt* 123–124 (1996–1997) [2000] 49–62.
KOVÁCS 1999/1
Kovács P., Vicus és castellum kapcsolata az Alsó-Pannoniai limes mentén. (Connections between vicus and fort along Pannoina Inferior *limes*) Studia Classica Universitatis Catholicae de Petro Pázmány Nominatae. Series Historica 1. Piliscsaba, 1999.
KOVÁCS 1999/2
P. Kovács., Civitas Eraviscorum. *Antaeus* 24 (1997–1998) [1999], 278–295.
KOVÁCS 1999/3
P. Kovács, Building Inscriptions of Septimius Severus from Pannonia, In: XI *Congresso Internazionale di Epigrafia Greca e Latina* (Roma, 18–24 settembre 1997). Atti, 521–531.
KOVÁCS 2000/1
P. Kovács, Nichtstädtische Siedlungen. In: *Augustus-Attila* 2000, 73–78.
KOVÁCS 2000/2
P. Kovács, Consistentes intra leugam. Epigraphica I. Studies on Epigraphy (eds. Gy. Németh – P. Forisek) *HPS* (HPS) 6, Debrecen, 2000, 39–56.
KOVÁCS 2001/1
P. Kovács, The Pannonian canabae in the 3rd century. *LAVERNA* 12 (2001) 42–46.
KOVÁCS 2001/2
Kovács P., Adatok a tetrarchia-kori katonai építkezésekről Pannoniában. (Data to the military building operations in Pannonia in the Tetrarchy Period) *AT* 45 (2001) 141–168.
KOVÁCS 2004
Kovács P., Recensio BÖLCSKE 2003. *AT* 48 (2004) 195–206.
KOVÁCS 2007
Kovács P., Caracalla pannoniai látogatása és a tartomány története (Kr. u. 211–217). A Caracalla-féle határ revízió. (Caracalla's vist to Pannonia and a history of the province [AD 211–217]) Revision of the Caracalla border) In: *Fontes Pannoniae antiquae. In aetate Severorum*. Budapest, 2007, 150–169.
KOVÁCS 2008
P. Kovács, Aquincum. In: *Studia Epigraphica Pannonica* I, Budapest, 2008, 29–44.
KUZSINSZKY 1889
Kuzsinszky B., A legújabb aquincumi ásatások. Aquincum canabái. (The most recent Aquincum excavations. The Aquincum *canabae*) *BudRég* 1 (1889) 41–58.
KUZSINSZKY 1891
Kuzsinszky B., Az aquincumi amphiteatrum. (The amphitheatre of Aquincum) *BudRég* 3 (1891) 81–139.
KUZSINSZKY 1892
Kuzsinszky B., Az építkezés Aquincumban. (Building operations in Aquincum) *BudRég* 4 (1892) 73–123.
KUZSINSZKY 1897
Kuzsinszky B., Az aquincumi castra kérdése.(Questions surrounding the Aquincum forts) *ArchÉrt* 17 (1897) 395–405.
KUZSINSZKY 1908
Kuzsinszky B., Magyarországon talált római kőemlékek a vidéki múzeumokban s egyéb helyeken.(Roman stone monuments from Hungary in country museums and elsewhere) In: *MKÉ* 2 (1908) 94, Fig. 29.
KUZSINSZKY 1932
Kuzsinszky B., A gázgyári római fazekastelep Aquincumban. (Das grosse Römische Töpferviertel in Aquincum. Zusammenfassung, p. 388–423) *BudRég* 11 (1932).
KUZSINSZKY 1934
V. Kuzsinszky, *Aquincum. Ausgrabungen und Funde*. Budapest, 1934.
LÁNG 2001
O. Láng, Research in the area of the Római Strandfürdő (Budapest, III, 2 Rozgonyi Piroska Street). *Aqfüz* 7 (2001) 89–95.
LÁNG 2002/1
O. Láng, A timber structure road North of the amphitheatre of the Aquincum Civil Town (Budapest III, 7 Zsófia Street). *Aqfüz* 8 (2002) 49–53.
LÁNG 2002/2
O. Láng, Recent Research in the territory of the Római Strandfürdő (Budapest III, 2 Rozgonyi Piroska Street, Római Strandfürdő). *Aqfüz* 8 (2002) 54–58.
LÁNG 2003
O, T. Láng, Roman Period road segments in the municipal territory of the Aquincum Civil Town (the environs of the so-called Testvérhegy villa) (Budapest III, 314 Bécsi Road). *Aqfüz* 9 (2003). 95–110.
LÁNG 2004
O, T. Láng, New data on the topographic position of the so-called Testvérhegy villa (Budapest III, 310 Bécsi Road). *Aqfüz* 10. (2004) 90–105.
LÁNG 2008
O, T. Láng, Functions and Phases: the "Peristyle-House" in the Civil Town of Aquincum. In: *DOMUS* 271–284.

LÁNG – GRYNAEUS 2005
T. Láng O. – Grynaeus A., Fa építőanyagok Aquincumban: régészeti és dendro-kronológiai eredmények. (Wooden Construction materials in Aquincum: archaeological and dendrocronological results. Res.) *BudRég* 39 (2005) 89–109.

LASSÁNYI 2002
G. Lassányi, Excavations in the area of the Aquincum municipium (Budapest III, 39 Kunigunda Road). *Aqfüz* 8 (2002) 59–66.

LASSÁNYI – SZILAS 2001
G. Lassányi – G. Szilas, Test excavation along Budapest III., Pusztakúti Road. *Aqfüz* 7 (2001) 96–102.

LINZBAUER 1837
P. Linzbauer, Die warmen Heilquellen der Hauptstadt Ofen im König-reiche Ungarn: geschichtlich und naturhistorisch beschrieben. Hartleben, Pesth, 1837.

LORBERER 1998
Lorberer Á., Óbuda a vizek városa. Óbuda-Békásmegyer egyedi tájértékei. (Óbuda, city of waters. The uniform soil resources of Óbuda-Békásmegyer) Konferencián elhangzott előadások (A. Csemez (ed.), Budapest, 1998, 7–12.

LŐRINCZ 1978
B. Lőrincz, Die Besatzungstruppen des Legionslagers von Aquincum am Ende des 1.–Anfang des 2. Jahrhunderts. *ActaArchHung* 30 (1978) 299–312.

LŐRINCZ 1981
Lőrincz B., Téglaégető kemencék Pannóniában (Brick kilns in Pannonia). Iparrégészeti kutatások Magyarországon, Veszprém, 1981, 77–93.

LŐRINCZ 2001
B. Lőrincz, Die römischen Hilfstruppen in Pannonien während der Prinzipatszeit. Teil I. *Die Inschriften*, Wiener Archäologische Studien 3, Wien 2001.

LŐRINCZ 2005
B. Lőrincz, Zu den Besatzungen der Auxiliarkastelle in Ostpannonien. In: *Römische Städte und Festungen an der Donau*. Akten der regionalen Konferenz, Beograd 16–19 Oktober 2003, Beograd, 2005, 61–62.

MADARASSY 1991/1
Madarassy O., A tribunus lacticlaviusok háza az aquincumi 2–3. sz.-i legiotáborban (Előzetes jelentés). A Mithraeum falfestménye. (Das Haus der Tribuni Lacticlavii aus dem Legionslager von 2–3 Jh in Aquincum /Vorbericht/. Wandgemlde des Mithrasheiligtums. Res.). *BudRég* 28, 1991, 123–126., Res. 154.

MADARASSY 1991/2
O. Madarassy, Die bemalte Kultwand im Mithräum des Legionslagers von Aquincum. *KjB* 24 (1991) 207–211.

MADARASSY 1991/3
O. Madarassy, ER., Budapest, III. Ecke der Tímár – Fényes Adolf Str. ArchÉrt 118. (1991) 123, No 25/3. = *RégFüz* 1/42, 33, No 64/11.

MADARASSY 1995
O. Madarassy, Investigations concerning Roman Period settlement density along the Northwestern border of the Aquincum Military Town. [An area bordered by Hunor Street–Hévízi Road–Kunigunda Street]. *Aqfüz* 1 (1995) 35–37.

MADARASSY 1996
O. Madarassy, Archaeological research at the Western edge of the Military Town (Budapest, District III, 1 Vályog Street, 8 Vályog Street and 13 Vályog Street). *Aqfüz* 2 (1996) 53–60.

MADARASSY 1997
O. Madarassy, Archaeological research in the Western edge of the Military Town (Budapest, District III, 3 Vályog Street–13 Vályog Street–167 Bécsi Street). *Aqfüz* 3 (1997) 48–53.

MADARASSY 1998
O. Madarassy, Recent research in the Western section of the Aquincum Military Town (Bp. District III, 8 Vályog Street). *Aqfüz* 4 (1998) 61–64.

MADARASSY 1999/1
O. Madarassy, Canabae legionis II Adiutricis. In: *LIMES* (1997) 643–649.

MADARASSY 1999/2
O. Madarassy, Investigating the settlement structure in the Southern section of the Aquincum Military Town (Bp. District III, 21 Timár Street) *Aqfüz* 5 (1999) 50–56.

MADARASSY 1999/3
O. Madarassy, Canabae legionis II Adiutricis. (Canabae legionis II. Adiutricis. Res.) In: *BÖLCSKE* 1999, 69–75.

MADARASSY 1999/4
O. Madarassy, Recent results of research along the western edge of the Military Town (Bp. District III, 14 Vályog Street). *Aqfüz* 5 (1999) 57–64.

MADARASSY 2000
O. Madarassy, Archaeological Investigations in the Military Town of Aquincum, 1999 (Budapest, District III, territory surounded by Bogdáni, Hévizi, Bécsi, Viador and Nagyszombat Streets). [6–8 Fényes Adolf Street; 19 Pacsirtamező Street; 25–26 Dévai Bíró Mátyás Square; 118–120 Lajos Street; 122 Lajos Street; 17 San Marco Street; 32 San Marco Street; 54 Föld Street; 127 Bécsi Road; 3/b–3/e. Hévizi Road]. *Aqfüz* 6 (2000) 46–55.

MADARASSY 2001/1
O. Madarassy, Research in the Southern part of the Aquincum Military Town. (Budapest, III, 118–120 Lajos Street; 19 Pacsirtamező Street). *Aqfüz* 7 (2001) 38–43.

MADARASSY 2001/2
O. Madarassy, Recent excavations at the western edge of the Aquincum Military Town (Budapest, III, 34 Selmeci Street; 32 San Marco Street; 123 Bécsi Road; 74 Kiscelli Road; 6–8 Vályog Street). *Aqfüz* 7 (2001) 52–58.

MADARASSY 2002
O. Madarassy, Archaeological excavations in the territory of the Aquincum Military Town (Budapest III, 4 Fényes Adolf Street; 112 Lajos Street–5 Fényes Adolf Street; 22 Szőlő Street; 6 Vályog Street). *Aqfüz* 8 (2002) 29–37.

MADARASSY 2003
O. Madarassy, Die Canabae legionis. In: *FORSCHUNGEN* 2003, 101–111.

MADARASSY 2004
O. Madarassy, The investigation of early Periods in the Southern section of the Aquincum canabae (Budapest III, 3–11/a Pacsirtamező Street). *Aqfüz* 10 (2004) 30–36.

MADARASSY – BUGÁN 1998
O. Madarassy – A. Bugán, Traces of a pottery workshop in the Southwestern section of the Aquincum Military Town [Bp. District III, 73 Kiscelli Street]. *Aqfüz* 4 (1998) 55–60.
MADARASSY–KÁRPÁTI 1998
O. Madarassy – Z. Kárpáti, A new discovery of buildings in the Southeastern region of the Military Town [Budapest, District III, 4 Fényes Adolf Street]. *Aqfüz* 4 (1998) 48–52.
MÁRITY 1989
E. Márity, Excavation record. Summarized text. 1989, Budaújlak, III/10. (71–85 Lajos Street). See also DEBITZKY 1991/2.
MÁRITY 1992
Márity E., *ÁsJel.*, Bp. III. Lajos u. 71–85. [ER., Budapest, III, 71–85 Lajos Street.] *ArchÉrt* 119 (1992) 104, No 21/4a.
MÁRITY 1993
Márity E., *ÁsJel.*, Budapest, III. Bécsi út 69–71. [ER., Budapest, III, 69–71 Bécsi Road] *RégFüz* I/45 (1993) 33–34, No 94/4.
MÁRITY 1996/1
Márity E., *ÁsJel.*, Budapest, III. Bécsi út 38–42. [ER., Budapest, III, 38-42 Bécsi Road] *RégFüz* I/47 (1996) 34, No 49/3.
MÁRITY 1996/2
Márity E., *ÁsJel.*, Budapest, III. Kolosy tér 6. [ER., Budapest, III, 6 Kolosy Square]. *RégFüz* I/47 (1996) 35, No 49/6.
MÁRITY 1997
Márity E., *ÁsJel.*, Budapest, III. Szépvölgyi út 15. [ER., Budapest, III, 15 Szépvölgyi Road]. *RégFüz* I/48 (1997) 36, No 44/9.
MAYER–VELAZA 2000
M. Mayer – J. Velaza, Versus reciproci y cuadrado mágico: la teja de Aquincum. ΕΠΙΓΡΑΦΑΙ. Miscellana epigratica in onore Lidio Gasperini (Cura G. Paci) Vol. 2, Tivoli (Roma), 2000, 613–620.
Mc KAY – FELLMANN 1984
A. G. Mc Kay, *Römische Häuser und Paläste.* Deutsche Ausgabe bearbeitet und erweitert von Rudolf Fellmann, Atlantis, 1984.
MELIS 1976
Melis K., Beszámoló a középkori Pest város területén végzett régészeti kutatások eredményeiről. (Report on the results of the archaeological research conducted in the area of the Medieval Town of Pest. Res.). *BudRég* 24 (1976) 313–333.
MINDSZENTY – HORVÁTH 2003
A. Mindszenty – Z. Horváth, Geoarcheology in the service of environmental reconstruction. *Aqfüz* 9. (2003) 16–32.
MINDSZENTY – HORVÁTH – KROLOPP 2006
Mindszenty A. – Horváth Z. – Krolopp E., *Archeopedológiai megfigyelések Aquincumban: késő pleisztocén és holocén környezetváltozás nyomai.* (Archeopedological observations in aquincum: Traces of Late Pleistocene and Holocene environmental changes) Mérnökgeológia – Kőzetmechanika. *BME* Építőanyagok és Mérnökgeológiai Tanszék, Műegyetemi Kiadó, Budapest, 2006.
MÓCSY 1951
Mócsy A., Attributio Aquincumban és a város decurioi. (Attributio in Aquincum and the Municicipal Decuriones. Res.). *ArchÉrt* 78 (1951) 107–110.
MÓCSY 1959
A. Mócsy, *Die Bevölkerung von Pannonien bis zu den Markomannenkriegen.* Budapest, 1959.
MÓCSY 1962
A. Mócsy, Pannonia. *RE* Suppl. IX. Stuttgart, 1962, 515–776.
MÓCSY 1970
A. Mócsy, Decurio Eraviscus *FolArch* 21 (1970) 59–66.
MÓCSY 1974/1
A. Mócsy, *Pannonia and Upper-Moesia.* London, 1974.
MÓCSY 1974//2
Mócsy A., *Pannonia a korai császárság idején.* (Pannonia in the Early Imperial Period) Budapest, 1974.
MÓCSY 1974/3
Mócsy A., *Pannonia története a késő császárkorban.* (The history of Pannonia int he Late Imperial Period) Budapest, 1974.
MÓCSY 1977
A. Mócsy, Pannonien und die Soldatenkaiser. *ANRW* II 6 (1977) 557–582.
MÓCSY 1990
Mócsy A., Canabaek és auxiliaris vicusok. Utóélet. (Canabae and Vici of auxillary forts) In: *PRK* Budapest, 1990, 65–66; 279–281.
MRÁV 1992–1995
Mráv Zs., Castellum contra Tautantum. Egy késő-római erőd azonosításának problémájához. (Castellum contra Tautantum. (Problems in identifying a Late Roman fortification) *Savaria* 22–23 (1992–1995) [1996] 11–19.
MRÁV 2003
Zs. Mráv, Castellum contra Tautantum. Zur Identifizierung einer spätrömischen Festung. In: BÖLCSKE 2003, 329–376.
NAGY L. 1931
L. Nagy, Cives Agrippinenses in Aquincum. *Germania* 15 (1931) 261–265.
NAGY L. 1932
L. Nagy, Ein neues Denkmal der Agrippinenses Transalpini aus Aquincum. *Germania* 16, 1932, 289–292.
NAGY L. 1934
Nagy L., Pest város eredete. (Előzetes jelentés az eskütéri ásatásról.) (The origin of the town Pest. Preliminary report on the Eskü Square excavations) *TBM* 3 (1934) 7–24.
NAGY L. 1937
Nagy L., Az Aquincumi Múzeum kutatásai és gyarapodása az 1923–1935 években. (Research and collection activity at the Aquincum Museum between 1923–1935) *BudRég* 12 (1937) 261–275.
NAGY L. 1942
Nagy L., Aquincum topográfiája. Temetők és temetkezés. Művészetek. Gazdasági élet. Aquincum és a későrómai védőrendszer. Kereszténység és kontinuitás Aquincumban. (Aquincum Topography. Cemeteries and burials. Artists. Economic life. Aquincum and the Late roman Defensive system. Christianity and continuity in Aquincum) *AQUINCUM* 1942, 353–385, 464–485, 579–650, 651–669, 747–764, 765–778.

NAGY L. 1946
Nagy L., *Az Eskü téri római erőd. Pest város őse.* (The Roman fortress on Eskü Square. The ancestor of Pest City) Budapest, 1946.
NAGY Ma. 1993
Nagy Margit, Óbuda a népvándorlás korban. (Óbuda zur Zeit der Völkervanderung. Res.) *BudRég* 30 (1993) 353–395.
NAGY Mi. 1997
Mihály Nagy, Routes in the Carpathian Basin and the Interaction between Romans and Barbarians. Peregrinatio Gothica. *Suppl. ad Acta Musei Moraviae Scientiae Sociales* 82 (1997) 157–162.
NAGY Mi 1999
Nagy Mihály, A pannoniai IV. századi burgus típusok méretei. (Dimension of the 4th century A.D. Burgus-types in Pannonia. Res.) *BÖLCSKE* 1999, 113–140.
NAGY T. 1943
Nagy T., A Fővárosi Régészeti és Ásatási Intézet jelentése az 1938–1942 között végzett kutatásairól. (Bericht des Archaeologischen Institutes von Budapest über die Forschungen der Jahre 1938–1942. Res.) *BudRég* 13 (1943) 359–399, 537–558.
NAGY T. 1950
Nagy T., Római kőemlékek Transaquincum területéről. (Roman stone monuments from Transaquincum. Res.). *BudRég* 15 (1950) 357–380.
NAGY T. 1962
Nagy T., *Buda régészeti emlékei. Budapest Műemlékei II.* (The Archaeological monuments of Buda. Historical Monuments of Budapest II.) Budapest, 1962, 13–116.
NAGY T. 1965
T. Nagy, Quelques aspects de la Romanisation dans la Pannonie orientale. *Actes VIII. Congr. internat. d'Archéologie Classique* (1963). Paris 1965, 375–381.
NAGY T. 1971/1
T. Nagy, Der vicus und das municipium von Aquincum. *ActaArchHung* 23 (1971) 59–81.
NAGY T. 1971/2
T. Nagy, The Frontier of Pannonia as reflected by recent research. In: *LIMES* 1967, Tel Aviv, 1971, 145–150.
NAGY T. 1973
Nagy T., Budapest története az őskortól a honfoglalásig. (History of Budapest from the prehistoric period to the Hungarian Conquest) In: *AQUINCUM* 1973, 39–216. Melléklet: Hidrológiai és régészeti térkép, összeállította Nagy Tibor és Nagy Ernő [Supplement: Hydrological and Archaeological map, compiled by Tibor Nagy and Ernő Nagy]
NAGY T. 1977
T. Nagy, Das zweite Lager der legio II Adiutrix in Aquincum (Óbuda). In: *LIMES* 1974, 359–366.
NÉMETH 1969
M. Németh, Rescue excavation documentation BTM DataBase inv. no. 432–77 [50, 54 Bécsi Road]
NÉMETH 1973
Németh M., *ÁsJel.*, Budapest, III. Bécsi út 50. [ER., Budapest, III, 50 Bécsi Road] *BudRég* 23 (1973) 260, No 23.
NÉMETH 1976/1
Németh M., Római kori lakóház és vízvezeték az aquincumi Canabaeban. (Előzetes jelentés) (Roman Period dwelling house and aqueduct in the Aquincum Canabae /Preliminary report/ [With the mistaken title of Res .: "A further epigraphic monument from Aquincum ont the visit of Septimius Severus in the year AD 202" p. 159. Budapest, III, in the place of 6-8 old Kiscelli Street, East of the dwelling at 65 Korvin Ottó Street] *BudRég* 24 (1976) 153–162.
NÉMETH 1976/2
Németh M., *ÁsJel.*, Budapest, III. Sújtás u. (ER., Budapest, III, Sújtás Street.) *BudRég* 24 (1976) 422., No 104.
NÉMETH 1976/3
Németh M., Septimius Severus 202. évi látogatásának emléke Aquincumból. (A further epigraphic monument from Aquincum on the visit of Septimius Severus in the year AD 202 Res.) *BudRég* 24 (1976) 193–204.
NÉMETH 1976/4
Németh M., *ÁsJel.*, Budapest, III. Kő u.–Laktanya u.–Hajógyári rkp–Vöröskereszt u. által határolt terület. [III. főnyomócső és a hrsz., 18365–18367 telek.] (ER., an area bordered by Budapest, III, Kő Street–Laktanya Street–Hajógyári Quay–Vöröskereszt Street. Budapest III, rising main and the lot Lrn. 18365–18367) *BudRég* 24 (1976) 417, No 85.
NÉMETH 1976/5
Németh M., *ÁsJel.*, Budapest, III. Laktanya u. 14–34. (III. sz. budai főnyomócső árkában [ER. III., 14–34 Laktanya Street (in the trench of the No. III.Buda rising main] *BudRég* 24 (1976) 416, No 80.
NÉMETH 1984
Németh M., *ÁsJel.*, Budapest, III. Kő u.–Laktanya u.–Hajógyári rkp–Vöröskereszt u. által határolt terület. [ER., An area bordered by Budapest, III, Kő Street–Laktanya Street–Hajógyári Quay–Vöröskereszt Street] *BudRég* 25 (1984) 468–469, No 63.
NÉMETH 1990
M. Németh, Forschungen in Alenkastell von Aquincum. In: *LIMES* 1986, 675–681.
NÉMETH 1991
Németh M., Aquincum. Feltárások az 1981–1988 közötti időszakban. (Aquincum. Erschliessungen in den Jahren 1981–1988. Res.). *BudRég* 28 (1991) 91–105.
NÉMETH 1991–1992
M. Németh, Stand der Forschungen in den Militärlagern von Aquincum. *Carnuntum Jb* (1991–1992) 81–87.
NÉMETH 1993
Németh M., Kutatások az aquincumi alatábor területén. (Forschungen im Gebiet des Ala-lagers von Aquincum. Res.) *BudRég* 30 (1993) 55–59.
NÉMETH 1994/1
M. Németh, Roman Military Camps in Aquincum. In: *PANNONIA* 139–152.
NÉMETH 1994/2
Németh M., *ÁsJel.*, Budapest, III. Hajógyári-sziget. [ER., Budapest, III, Hajógyári Island] *RégFüz.* Ser. 1/46. (1994) 35–36., No 50/6.

NÉMETH 1997
Németh M., Az aquincumi táborkutatás eredményei és feladatai. (Roman military forts in Aquincum.] [Only the title of the paper is present in English] *BudRég* 31 (1997) 255–267.
NÉMETH 1999
Németh M., A rákospataki híd és az aquincumi Duna-szakasz védelmének kérdései. (Die Brücke beim Rakoschbach und Fragen der Verteidigung des Donauabschnittes im Bereich von Aquincum. Res.) In: *BÖLCSKE* 1998, 141–159.
NÉMETH 2000/1
M. Németh, Geschichte und Archäologie der Aquincum vorgelagerten Inseln. In: *Inseln in der Archäologie. Vorgeschichte, klassische Antike, Mittelalter, Neuzeit.* Internationaler Kongress 1998 in Starnberg. München, 2000, 173–182.
NÉMETH 2000/2
Németh M., Vezető az Aquincumi Múzeum kőtárában. (Guide to the lapidarium of the the Aquincum Museum) Budapest, 2000.
NÉMETH 2001
Németh M., ER., Budapest, III. Hajógyársziget. (sic!) *Aqfüz* 7 (2001) 141–142.
NÉMETH 2003/1
M. Németh, Aquincum in der Kaiserzeit. In: *FORSCHUNGEN* 2003, 54–62.
NÉMETH 2003/2
M. Németh, Die Militäranlagen von Óbuda. In: *FORSCHUNGEN* 2003, 85–91.
NÉMETH 2003/3
M. Németh, Wachtürme und Festungen am linken Donauufer. In: *FORSCHUNGEN* 2003. 96. etc.
NÉMETH 2003/4
M. Németh, Contra Aquincum fortress. In: *The Roman Army in Pannonia. An Archaeological Guide of the Ripa Pannonica.* (ed. Zs. Visy) László Teleki Foundation, 2003, 201–203.
NÉMETH 2004
M. Németh, Topographic investigations in the Northeastern foreground of the legionary fortress in Aquincum (Budapest III, 1 Raktár Street). *Aqfüz* 10 (2004) 42–46.
NÉMETH 2005/1
M. Németh, Epigraphische Angaben zur Topographie des Legionslagers und der Militärstadt von Aquincum. In: *STÄDTE.* 113–132.
NEMETH 2005/2
M. Németh, Zur Funktion der Thermae Maiores von Aquincum im 4. Jahrhundert. In: *LIMES* 2003, 667–679.
NÉMETH 2005/3
Németh M., Az Aquincumi Thermae Maiores funkcióváltásához a 4. században. (Zur Funktion der Thermae Maiores von Aquincum im 4. Jahrundert. Res.). *BudRég* 39 (2005) 137–150.
NÉMETH 2006/1
Németh M., Az aquincumi fürdő múzeum és a legiotábor emlékei. Vezető. (Monuments at the Aquincum baths museum and legionary fortress. Guide.) *Aqzsebk* 3. Budapest 2006.
NÉMETH 2006/2
Németh M., Az aquincumi Hercules villa és a katonaváros emlékei. Vezető. (Monuments at the Aquincum Hercules villa and Military Town. Guide.) *Aqzsebk* 2. Budapest 2006.
NÉMETH 2008
M. Németh, Wohnhaus und öffentliches Gebäude – Beiträge zur Topographie des Statthaltersitzes von Aquincum. In: *DOMUS* 307–321.
NÉMETH GY. n.d.
Németh Gy., Ókori gyermekjátékok. (Children's games in Antiquity) ANNO Kiadó, no date.
NYÉKHELYI – MÁRITY 1994
B. Nyékhelyi D. – Pölös A. – Márity E., *ÁsJel., RégFüz* Ser. 1. No. 46 (1994) p. 65–66. No 91/1, Budapest, III. Bécsi út 65–67. (ókori "Duna-ág"); No 91/2, Budapest, III. Bécsi út 69–71.; No 92/2, Budapest, III. Dereglye u. 5. [ER., *RégFüz* Ser. 1. No. 46 (1994) p. 65–66: No 91/1, Budapest, III, 65-67 Bécsi Road (ancient "Danube-branch"); No 91/2, Budapest, III, 69–71 Bécsi Road.; No 92/2, Budapest, III, 5 Dereglye Street].
PAPP 2000
Papp Á., A kövi Szűz Mária plébániatemplom. (The stone parish church of the Virgin Mary) In: *Óbuda évszázadai* (Óbuda's century) (Ed. Kiss Cs.) Budapest, 2000, 445–447.
PARRAGI 1971
Parragi Gy., Kora-császárkori fazekasműhely Óbudán. (Budapest, III. Bécsi út 126–128) (A potter's workshop at Óbuda from the early imperial period. /Budapest, III., 126–128 Bécsi Road/ Res.). *ArchÉrt* 98 (1971) 60–79.
PARRAGI 1973/1
Parragi Gy., *ÁsJel.*, Budapest, III. Dévai Bíró Mátyás tér [közműárkok]. [ER., Budapest, III, Dévai Bíró Mátyás Square [public utilities trench] *BudRég* 23 (1973) 261–262, No 27.
PARRAGI 1973/2
Parragi Gy., *ÁsJel.*, Budapest, III. Bécsi út 122. [ER., Budapest, III, 122 Bécsi Road.] *BudRég* 23 (1973) 260, No 24.
PARRAGI 1973/3
Parragi Gy., *ÁsJel.*, Budapest, III. Bécsi út 124–128. [ER., Budapest III, 124–128 Bécsi Road.] *BudRég* 23 (1973) 261, No 25.
PARRAGI 1973/4
Parragi Gy., *ÁsJel.*, Budapest, III. Szőlő utca 57., 62., Szőlő köz 2. [ER., Budapest III, 57, 62 Szőlő Street, 2. Szőlő Lane] *BudRég* 23 (1973) 268, No 48–49, No 51.
PARRAGI 1976/1
Parragi Gy., Jelentés a Fényes Adolf utcában feltárt déli kaputorony ásatásáról. (Report on the excavation of the Southern gate-tower opened up in Fényes Adolf Street. Res.) [Budapest III, 78–84 Fényes A. Street]). *BudRég* 24 (1976) 137–144.
PARRAGI 1976/2
Parragi Gy., A Bécsi úti ásatások újabb eredményei. (The results of the recent excavations at Bécsi Road). [Budapest III, 124 Bécsi Road. Res.] *BudRég* 24 (1976) 163–167.
PARRAGI 1976/3
Parragi Gy., *ÁsJel.*, Budapest, III. Sorompó u. 2.–Folyamőr u. 1–3. [ER., Budapest III, 2 Sorompó Street–1–3 Folyamőr Street] *BudRég* 24 (1976) 417, No 86.

PARRAGI 1976/4
Parragi Gy., *ÁsJel.*, Budapest, III. Folyamőr u. 14–16. [ER., Budapest III, 14–16 Folyamőr Street.] *RégFüz* 1/29 (1976) 30., No 53/25. = *BudRég* 24 (1976) 417, No 87–88.

PARRAGI 1978
Parragi Gy., *ÁsJel.*, Budapest, Budapest, III. Folyamőr u. 16. [ER., Budapest III, 16 Folyamőr Street.] *RégFüz* 1/31 (1978) 36, No B/2.

PARRAGI 1984
Parragi Gy., *ÁsJel.*, Budapest, III. Folyamőr u. 16. [ER., Budapest III, 16 Folyamőr Street] *BudRég* 25 (1984) 464, No 37.

PARRAGI 1991
Parragi Gy., A Folyamőr utcai római villa. (Römische Villa in der Folyamőr Gasse. Res.). *BudRég* 28 (1991) 199–216.

PETŐ 1976/1
Pető M., Római kori sírépítmény és szentély darabjai Csillaghegyen. [Budapest, III. Csillaghegy, Árpád u. 6.]. (Fragments of a Roman funerary monument and shrine at Csillaghegy. [Budapest III, Csillaghegy, 6 Árpád Street] Res.). *BudRég* 24 (1976) 215–224.

PETŐ 1976/2
Pető M., Feltárások a II–III. századi aquincumi legiostábor retenturájában. (Excavations in the retentura of the 2–3 century A.D. Legionary fortress of Aquincum. Res.). [Budapest III, 22 Vörösvári Road] *BudRég* 24 (1976) 113–121.

PETŐ 1984
Pető M., *ÁsJel.*, Budapest, III. Bécsi út 120. [ER., Budapest III, 120 Bécsi Road] *BudRég* 25 (1984) 462, No 25.

PETŐ 1993
M. Pető, Reste einer römischen Villa am Csillaghegy. [Budapest, corner of Pusztakúti Road and Határ Road]. *BudRég* 30 (1993) 149–158.

PETŐ 1998
Pető M., A gellérthegyi kőbánya. (The Gellért Hill quarry. Res.). *BudRég* 32 (1998) 123–133.

PÉCSI – MAROSI – SZILÁRD 1958
Pécsi M. – Marosi S. – Szilárd J. (eds), Budapest természeti képe. (Image of the natural landscape of Budapest) Akadémiai Kiadó, Budapest, 1958.

PÉCSI 1959
Pécsi M., A magyarországi Duna-völgy kialakulása és felszínalaktana. (The development and surface morphology of the Danube Valley in Hungary) *Földrajzi Monográfiák 3.* Akadémiai Kiadó, Budapest, 1959.

PÉCSI 1974
Pécsi M., A Budai-hegység geomorfológiai kialakulása, tekintettel hegytípusaira. (The geomorphological development of the Buda Hills, concerning its hill types) *Földr. Ért.* 23 (1974) 181–192.

PÉCSI – SCHEUER – SCHWEITZER 1982
M. Pécsi – Gy. Scheuer – F. Schweitzer, Geomorphological and chronological classification of Hungarian travertines. In: *Quaternary Studies in Hun*gary (Ed Pécsi M.), Geographical Research Institute of the HAS, Budapest, 1982. 113–117.

PÉCSI – SZILÁRD – LOVÁSZ – JUHÁSZ –SCHWEITZER 1981
Pécsi M. – Szilárd J. – Lovász Gy. – Juhász Á. – Schweitzer F., *Budapest építésföldtani térképezése.* Magyarázó és dokumentáció Budapest 1:20 000 ma. mérnökgeomorfológiai térképéhez (Budapest architectural and geographical map. Explanation and documentation to engineering geomorphological map of Budapest scale 1:20,000). MTA Földrajztudományi Kutatóintézet, Budapest, 1981.

PISO 1991
I. Piso, Die Inschriften vom Pfaffenberg und der Bereich der Canabae legionis. *Tyché* 6 (1991) 131–169.

PISO 1995
I. Piso, Eine Paralelle zwischen den Praetoria der Statthalter in Carnuntum und in Apulum. *CarnuntumJb* (1993/94) [1995] 203–309.

PISO – DIACONESCU 1993
I. Piso – Al. Diaconescu, Apulum. In: *Politique edilitaire dans les provinces des l' empire romain*, Cluj-Napoca, 1993, 67–82.

PISO 2003
I. Piso, Jupiter Optimus Maximus auf dem Pfaffenberg/Carnuntum 1. Die Inschriften. *RLiÖ* 41 Wien, 2003.

PÓCZY 1955
Póczy K., Római épületek Óbudán a Kiscelli u. 10. sz. alatt. (Römische Gebäude von Óbuda /Kiscelli Str. 10/. Res.). *BudRég* 16 (1955) 41–88.

PÓCZY 1956
K, Sz. Póczy, Die Törpferwerkstätten von Aquincum. *ActaArchHun*g 7 (1956) 74–138.

PÓCZY 1958
Póczy K., Az aquincumi helytartói palota falfestészete. (Die Wandmalerei des Statthaltenpalasten von Aquincum. Res.) *BudRég* 18 (1958) 103–148.

PÓCZY 1961
K. Póczy, Die Rolle der Kölner Kaufleuten in der Entwicklung der Zivilstadt Aquincum. *ActaArchHung* 13 (1961) 97–112.

PÓCZY 1972
Póczy K., Aquincum első aquaeductusa. (Le premiere aqueduc d'Aquincum. Res.). *ArchÉrt* 99 (1972) 9–32.

PÓCZY 1975
Póczy K., *ÁsJel.*, A legios tábor kutatása *RégFüz* 1/28 (1975) 37, No 32, No 36., [A déli kapu körzete, (Budapest, III. Pacsirta u. 14.–Gyűrű u. sarok)] No 37., [A praetoria fronton raktár rendszer (Budapest, III. Polgár u.). Késő császárkori apszisos épület (Budapest, III. Polgár u.–Tavasz u.sarok)]. [ER., Legionary fortress *RégFüz* 1/28 (1975) 37, No 32, No 36., [The region of the Southern gate (Budapest III, corner of 14 Pacsirta Street–Gyűrű Street)] No 37, [A storeroom system by the *praetoria* front (Budapest III, Polgár Street). A building with an apsis from the Late Imperial Period (Budapest III, corner of Polgár Street–Tavasz Street)].

PÓCZY 1976/1
Póczy K., Az aquincumi legiotábor és katonaváros romjainak a feltárása és műemléki bemutathatósága. (Investigation of the Aquincum legionary fortress and the restoration of its ruins. Res.). *BudRég* 24 (1976) 11–26.

PÓCZY 1976/2
Póczy K., *Pannoniai városok.* (Towns in Pannonia) Budapest 1976.
PÓCZY 1976/3
Póczy K., A porta praetoria feltárása az aquincumi legiostáborban. (The excavation of the porta praetoria in the Aquincum legionary fortress Res.). *BudRég* 24 (1976) 79–91.
PÓCZY 1977/1
K. Póczy, Beiträge zur Baugeschichte des Legionslagers Aquincum. In: *LIMES* 1974, 373–379.
PÓCZY 1977/2
Póczy K., *ÁsJel.*, Budapest, III. Perc u.–Fényes A. u. sarok. [ER., Budapest III, corner of Perc Street–Fényes A. Street] *RégFüz* 1/30 (1977) 20, No B/11.
PÓCZY 1980/1
Póczy K., *Közművek a római kori Magyarországon.* (Public Utilities in Roman Period Hungary) Budapest, 1980.
PÓCZY 1980/2
Póczy K., Szent kerületek Aquincum és Brigetio aquaeductusánál. (Sanctuaries près des aqueducs d'Aquincum et de Brigetio. Res.). *ArchÉrt* 107 (1980) 3–29.
PÓCZY 1983
Póczy K., Az aquincumi katonaváros utcahálózata és fontosabb épületei a II. és a III. században. (Das Strassennetz und die Wichtigeren gebäude der Militärstadt von Aquincum in 2 und 3 Jahrundert. Res.). *ArchÉrt* 110 (1983) 252–273.
PÓCZY 1984/1
Póczy K., Aquincum – Castra, Canabae, Colonia. (Az 1976–1980 közötti időszak ásatási eredményeinek összefoglalása). (Aquincum – Castra, Canabae, Colonia. /Zusammenfassung der Grabungsergebnisse der Periode 1976–1980/ Res.) *BudRég* 25 (1984) 15–25.
PÓCZY 1984/2
Póczy K., *ÁsJel.*, Budapest, III. Perc u.–Fényes A. u. (ER., Budapest III, Perc Street–Fényes A. Street) *BudRég* 25 (1984) 471, No 81.
PÓCZY 1986
K. Póczy, Die Militärstadt von Aquincum im 2. und 3. Jahrhundert. In: *LIMES* 1983, 404–408.
PÓCZY 1990
K. Póczy, Zur Baugeschichte des Legionslagers von Aquincum zwischen 260–320. In: *LIMES* 1986, 689–702.
PÓCZY 1994
K. Póczy, La cittá di Aquincum sede del luogotenente della Pannonia Inferiore. In: *PANNONIA* 221–231.
PÓCZY 1995
K. Póczy, *Der Aquädukt im Stadtbild des Munizipiums von Aquincum (Pannonien).* Arculiana, Avenches, 1995, 469–477.
PÓCZY 1998
K. Póczy, Il prolungamento della via Postumia con il tratto tra Aquileia ed Aquincum. Optima via, Atti del Convenio Internazionale di Studi Postumia, Cremona, 1998, 161–168.
PÓCZY 1999
Póczy K., Iuppiter Optimus Maximus Teutanus Aquincumban. (Iuppiter Optimus Maximus Teutanus in Aquincum. Res.). In: *BÖLCSKE* 1999 201–223.
PÓCZY – NÉMETH – SZIRMAI – KOCSIS 1986
K. Póczy *et al.*, Das Legionslager von Aquincum. In: *LIMES* 1983, 398–403.
PÓCZY – ZSIDI 1992
K. Póczy – P. Zsidi, Römische Keramik in Aquincum. Kiállítási katalógus. (Exhibition catalogue) Budapest, 1992.
PÖLÖS 1994
Pölös A., *ÁsJel.*, Budapest, III. Bécsi út 34–36. [ER., Budapest III, 34–36 Bécsi Road.] *RégFüz* I/46 (1994) 88–89, No 121/11.
PRECHT 1973
G. Precht, *Baugeschichtliche Untersuchung zum römischen Praetorium in Köln*, 1973.
RADNÓTI 1955
Radnóti A., Buda régészeti emlékei. Magyarország Műemléki Topográfiája IV. kötet. (The archaeological monuments of Buda. Hungarian Monument Topography. Vol. IV) Budapest Műemlékei. Budapest, 1955, 13–34.
RÓMER 1863
Rómer F., Kiadatlan római feliratok. (Unpublished Roman inscriptions) *ArchKözl* 3 (1863) 151–166.
RÓMER 1876
Rómer F. Kiadatlan római feliratok. (Unpublished Roman inscriptions) *ArchKözl* 10 (1876) 25–57.
SACKEN 1857
E. v. Sacken, *Die römische Bäder in Alt-Ofen.* Mitteilungen der k. k. Central Comission Erhaltung der Baudenkmäler 2 (1857) 283 ff.
SALAMON 1878
Salamon F., Buda-Pest az ókorban (Buda-Pest in the Antique Period). In: *Budapest története* I. (The history of Budapest I.) Budapest, 1878.
SCHAFARZIK 1920
F. Schafarzik, Szökevény hévforrások a Gellérthegy tövében. (Emerging thermal springs at the base of Gellért Hill) *Földt. Közl.* 50 (1920) 79–83.
SCHAMS 1821
F. Schams, *Vollständige Beschreibung der königlichen Freystadt Pest in Ungarn.* Hartlebens Verlag, Pest, 1821.
SCHERLEIN 2001
Schreilein A., Aquincum – Mocsáros dűlői villa pars urbana része. Szakdolgozat. ELTE Bölcsészettudományi Kar, Régészeti Intézet (Aquincum–Mocsárosdűlő villa pars urbana section Thesis. Archaeological Institute of the ELTE) Budapest, 2001)
SCHEUER – REMÉNYI – TÓTH 1979
Scheuer Gy. – Reményi P. – Tóth I.-né., Budapest mérnökgeológiai és építéshidrológiai térképezése. (Mapping of Budapest engineering geology and architectural hydrology) *ÉGSZI Gyorsjelentés.* 36. Budapest, 1979.
SCHEUER – SCHWEITZER 1974
Scheuer Gy. – Schweitzer F., Új szempontok a Budai-hegység környéki édesvízi mészkőösszletek képződéséhez. (New perspectives on the development of the sweet water limestone structures in the Buda-Hills area) *Földr. Ért.* 23 (1974) 113–134.
SCHEUER – SCHWEITZER 1980
Scheuer Gy. – Schweitzer F., A budai hévízforrások fejlődéstörténete a felsőpannontól napjainkig. (The development history of the Buda thermal

springs from the Upper Pannonian era to today) *Hidr. Közl.* 60 (1980) 492–501.

SCHEUER – TÓTH 1975

Scheuer Gy. – Tóth I.-né., Az óbudai Árpád-forrás földtani és vízföldtani viszonyai. (The geographical and hydrolic situation of the Óbuda Árpád Spring) *Földt. Kut.* 1–2 (1975). 41–45.

SCHEUER – TÓTH 1982

Scheuer Gy. – Tóth I.-né., A Budakalászi–Óbudai-öblözet építés-hidrológiai viszonyai. (The architectural-hydrological situation of the Budakalász–Óbuda Cove) *Hidr. Tájékozt.* 1. (1982) 24–27.

SCHREIER 1932

Schreier F., Adatok a Buda–Pilisi hegység Nagykevély hegycsoportjának hidrológiai viszonyaihoz. (Notes on the the hydrological situation of the Nagykevély Mountain group in the Buda–Pilis Mountains) *Hidr. Közl.* 12 (1932) 46–64.

SCHWEITZER – VICZIÁN – BALOGH – JAKAB 2009

Schweitzer F. – Viczián I. – Balogh J. – Jakab G., *Az Óbudai-sziget déli részén folytatott régészeti feltárások környezetének talajtani, ősföldrajzi és geomorfológiai viszonyai.* (Pedological, geographical and geomorphological situation in the environment of the Southern part of the Óbudai Island archaeological excavations) Manuscript report, MTA FKI, Budapest, 2009.

SOPRONI 1977

S. Soproni, Contra Acinco et Bononia, Bemerkungen zu den Fasti des Hydatius. In *LIMES* 1974, 393–397.

SOPRONI 1978

S. Soproni, *Der spätrömische Limes zwischen Esztergom und Szentendre. Das Verteidigungsystem der Provinz Valeria im 4. Jahrhundert.* Budapest, 1978.

SOPRONI 1986

S. Soproni, Nachvalentinianische Festungen am Donaulimes. In: *LIMES* 1983, 409–415.

SOPRONI 1990

Soproni S., Előzetes jelentés a bölcskei későrómai ellenerőd kutatásáról. (Vorlufiger Bericht über die Erforschung der sptrömischen Gegefestung in Bölcske. Res.). *CommArchHung* (1990) [1991] 133–142.

SOPRONI 1993/1

S. Soproni, CIL III 10481. *BudRég* 30 (1993) 177–184.

SOPRONI 1993/2

S. Soproni, Pannonische Burgus-Bauinschriften aus der Commodus-Zeit. *Mitteilungen des Museumsvereins Lauriacum* 1993, 10–15.

SOPRONI 1996

S. Soproni, Zu den Burgusbau-Inschriften von Commodus. *Festschrift für Jenő Fitz*, Székesfehérvár, 1996, 91–94.

STROBEL 1988

K. Strobel, Zur Dislozierung der römischen Legionen in Pannonien zwischen 89 und 118 n. Chr. Tyche 3 (1988) 193–222.

SZABÓ 1857

Szabó J., *Fürdősziget Pest és Buda között.* (The Fürdő Island between Pest and Buda) Magyar Természettudományi Társulat Évkönyvei. III. kötet 1851–1856. Pest, 1857, 250–256.

SZILÁGYI 1938

Szilágyi J., *Aquincum és északkelet Pannonia katonai megszállása.* (Die römische Okkupation von Aquincum und Nordostpannonien. Res.) Laureae Aquincenses I DissPann II/10 (1938) 287–311.

SZILÁGYI 1942

Szilágyi J., Aquincum helyőrsége. *Budapest Története* II. (The garrison troops of Aquincum. History of Budapest II.) AQUINCUM 1942, 486–524.

SZILÁGYI 1943

Szilágyi J., Az Aquincumi Múzeum kutatásai az 1936–42. évek folyamán. (Die Forschungen und Neuerwerbungen des Museums von Aquincum in den Jahren 1936–1942. Res. 528–536) *BudRég* 13 (1943) 353–355.

SZILÁGYI 1945

Szilágyi J., Az aquincumi helytartói palota. (Die Legationpalast in Aquincum. Res.). BudRég 14 (1945) 29–153.

SZILÁGYI 1950

Szilágyi J., Nyitott csarnokos és körkörös építmény (sétacsarnok és színház?) az aquincumi katonai kolóniában. (Une galerie ouverte et un edifice circulaire /galerie promenade en theatre?/ dans la colonie militaire d'Aquincum. Res.) *BudRég* 15 (1950) 479–499.

SZILÁGYI 1955

Szilágyi J., A római kori ásatások fontosabb eredményei Budapest területén és az Aquincumi Múzeum értékesebb gyarapodásai az 1951–1953. években (Wichtige Ergebnisse Römerzeitlicher Ausgrabungen in Gebiet von Budapest und wertvolle Bereicherzeugen des Museums v. Aquincum in Jahre 1951–1953. Res.). *BudRég* 16 (1955) 387–426.

SZILÁGYI 1956

Szilágyi J., *Az aquincumi amfiteátrumok.* (The amphitheatres of Aquincum) Képzőművészeti Alap, Budapest, 1956.

SZILÁGYI 1958

Szilágyi J., Az aquincumi helytartói palota. (Die Statthaltenpalast von Aquincum. Res.) *BudRég* 18 (1958) 52–78.

SZILÁGYI 1967

Szilágyi J., Kőfeliratok az Aquincumi Múzeum régi gyűjtéséből II. (Steinschriften aus der alten Sammlung des Museums von Aquincum II. Res.). *ArchÉrt* 94 (1967) 70–79.

SZILÁGYI 1968

J. Szilágyi, *Aquincum*. RE Suppl. XI. Stuttgart, 1968, 61–136.

SZILÁGYI 1971

Szilágyi J., Adatok az aquincumi helytartói villacsoport keltezéséhez. (Zum entstehen der Villengruppe des Statthalters von Aquincum. Res.) *ArchÉrt* 98 (1971) 53–59.

SZILÁGYI 1973.

Szilágyi J., *ÁsJel.*, III. Hajógyári-sziget, Óbudai hajógyár. [ER., Budapest III, Hajógyári Island, Óbuda Shipyard] *BudRég* 23 (1973) 263, No 30.

SZIRMAI 1976/1

Szirmai K., Előzetes beszámoló az óbudai legiostábor principiáján és közvetlen környékén végzett

kutatásokról. (Preliminary report on the excavations conducted at the principia of the Óbuda legionary fortress and its immediate vicinity. Res.). [The area below Budapest, III., Business centre on Flórián Square, South of 19–29 Kórház Street, bordered by the Western edge of Flórián Square and by 3-1.Vörösvári Road] *BudRég* 24 (1976) 91–109.

SZIRMAI 1976/2

Szirmai K., *ÁsJel.*, Budapest, V. Március 15. tér [ER., Budapest V, Március 15 Square.] *BudRég* 24 (1976) 425–426, No 121.

SZIRMAI 1984/1

Szirmai K., *ÁsJel.*, Budapest, III. Folyamőr u. 14–16. [ER., Budapest III, 14–16 Folyamőr Street.] *BudRég* 25 (1984) 464, No 36.

SZIRMAI 1984/2

Szirmai K., *ÁsJel.*, Budapest, III. Búvár u. 1–3. [ER.,Budapest III, 1–3 Búvár Street.] *BudRég* 25 (1984) 463, No 31.

SZIRMAI 1984/3

Szirmai K., Újabb feliratos kőemlékek az Aquincumi Múzeumban. (Neuere Inschriften in Museum von Aquincum. Res.). *BudRég* 25 (1984) 255–264.

SZIRMAI 1984/4

Szirmai K., Újabb adatok az aquincumi legiotábor falfestészetéhez. (Neuere Angaben zur Wandmalerei des Legionslagers vin Aquincum. Res.). *BudRég* 25 (1984) 247–253.

SZIRMAI 1986

K. Szirmai, Bronzstatuetten aus Aquincum. Budapest, 1986.

SZIRMAI 1990

K. Szirmai, Zur Chronologie der Auxiliarkastelle und des Legionslagers des 2–3. Jahrhunderts in Aquincum. In: *LIMES* 1986, 683–688.

SZIRMAI 1991/1

Szirmai K., Régészeti adatok az aquincumi 1. századi legiotáborhoz, valamint a 2–3. századi legiotábor retenturájához. (Archologische Beitrge zum Legionslager in Aquincums aus dem 1 Jahrundert sowie zur Retentur des Legionslagers. Res.). *BudRég* 27 (1991) 105–137.

SZIRMAI 1991/2

Szirmai K. – Gádor J., *ÁsJel.*, Budapest, III. Lajos u. 23–31. [ER., Budapest III, 23–1 Lajos Street.] *RégFüz* 1/43 (1991) 23, No 47/4.

SZIRMAI 1991/3

K. Szirmai, Neue Wandegemälde auf dem Gebiet der Lagerstadt von Aquincum. *Kjb* 24 (1991) 202–206.

SZIRMAI 1991/4

K. Szirmai, Barrack-blocks in the praetentura of the legionary fortress in Aquincum (1987–1988) In: *LIMES* 1989, 259–262.

SZIRMAI 1997

Szirmai K., Kaszárnyák az aquincumi 2–3. századi legiotábor praetenturájában.(Barracks of the praetorium in the 2nd–3rd century AD legionary fortress) (1987–1988). [Budapest III, Kórház Street] *BudRég* 31 (1997) 273–279. See SZIRMAI 1991/4.

SZIRMAI 1998

Szirmai K., Új mozaik padlók az aquincumi katonaváros északi részén. (New mosaic floor from the Northern part of the Aquicum Military Town) *BudRég* 32 (1998) 157–164.

SZIRMAI 1999

K. Szirmai, *Kaiserzeitliche Porträts in Aquincum.* Katalog der Ausstellung. Budapest, 1999.

SZIRMAI 2000

Szirmai K., Bemutatott és bemutatásra kerülő falfestmények az aquincumi táborból és canabaeból. (Augestellte und Auszustellende Wandgemde aus dem Aquincumer Legionslager und den Canabae. Res.) In: A római kori falfestészet Pannoniában. (Roman Period Wall-Painting in Pannonia) *Acta Archeologica Brigetionensia* Ser. I. Vol. 1. Budapest–Komárom, 2000, 124–131.

SZIRMAI 2003

K. Szirmai – E. Kovács, Archaeological observations during the small interrior reconstruction work at the Belvárosi parish church (Budapest V, Március 15 Square). *Aqfüz* 9 (2003) 162–172.

SZIRMAI 2008

K. Szirmai, A Peristyle House in the Northern Part of the Canabae in Aquincum. In: *DOMUS* 323–331.

SZIRMAI – ALTMANN 1976

Szirmai K. – Altmann J., Előzetes jelentés a ferencesek temploma és a via praetoriától északra húzódó római épületek maradványainak kutatásáról. (Preliminary report on the Archaeological excavations of the Franciscan church and the Roman structural remains from the North of the via praetoria. Res.) [A site bordered by an area North of the Northern side of Kórház Street–South of Miklós Street–pulled down houses beneath 14–21 old Vörövári Road]. *BudRég* 24 (1976) 233–255.

TOPÁL 1993

J. Topál, *Roman cementeries of Aquincum, Pannonia.* The Western cemetery Bécsi Road. I Aquincum Nostrum. I. Budapest, 1993.

TOPÁL 1996/1

J. Topál, Late Roman graves on the western edge of the Aquincum Military town (Budapest III, 8 Vályog Street). *Aqfüz* 2 (1996) 50–52.

TOPÁL 1996/2

J. Topál, Rescue excavations in the western cemetery of the Aquincum Military town (Budapest III, 25 Kecske Street, 100 Bécsi Street). *Aqfüz* 2 (1996) 44–49.

TOPÁL 2003

J. Topál, *Roman cementeries of Aquincum, Pannonia.* The western cementery Bécsi Road. II Aquincum Nostrum I. 2. Budapest, 2003.

TORMA 1984

Torma I., Római kori kőbánya Budakalász határában. (Roman quarry near the village Budakalász). *Iparrégészet* 2. Veszprém, 1984, 39–49.

TÓTH 1976/1

Tóth E., Pannonia provincia kialakulásához. (Zur Entstehung des Provinz Pannonien. Res.). *ArchÉrt* 103 (1976) 197–202.

TÓTH 1976/2

Tóth E., Pannonia történetének problémái. (Problems in Pannonian History) *AT* 23 (1976) 114–126.

TÓTH 1977

Tóth E., Pannonia és Noricum közös határának a kialakulása.(The development of the border between Pannonia and Noricum) *AT* 24 (1977) 192–200.

TÓTH 1980
Tóth E., Vitás kérdések Pannonia 4. sz.-i történetében. (Debated questions concerning the 4th century AD history of Pannonia), *AT* 27 (1980) 131–137.
TÓTH 1981
Tóth E., Megjegyzések Pannonia provincia kialakulásának kérdéséhez (Bemerkungen zur Entstehung der Provinz Pannonien. Res.). *ArchÉrt* 108 (1981) 13–33.
TÓTH 1985/1
E. Tóth, Die ptolemäische Bestimmung der gemeinsamen Grenze von Pannonia Superior und Inferior, *FolArch* 36 (1985) 85–100.
TÓTH 1985/2
E. Tóth, Zur Chronologie der militärischen Bautätigkeiten des 4. Jh. in Pannonien. *MittArchInst* 14 (1985) 121–136.
TÓTH 1994
E. Tóth, Das Christentum in Pannonien bis zum 7. Jahrhundert nach den archäologischen Zeugnisse. In: *Das Christentum im Bayerischen Raum*. (eds. E. Boshof – H. Wolff) Köln–Wien, 1994, 256–257.
TÓTH 2003
E. Tóth, Die Iupiter Teutanus Altäre. In: *BÖLCSKE* 2003, 385–438.
TÓTH 2006
Tóth E., *Itineraria Pannonica. Római utak a Dunántúlon.* (*Itineraria Pannonica.* Roman Roads in Transdanubia) Budapest, 2006.
TÓTH – VÉKONY 1970/1
E. Tóth – G. Vékony, Beitrage zu Pannoniens Geschichte im Zeitalter des Vespasianus. *ActaArchHung* 22 (1970) 134–161.
TÓTH – VÉKONY 1970/2
Tóth E. – Vékony G., Vespasianus-kori építési felirat Aquincumban. (A building inscription in Aquincum from the Vespasian Period. Res.) *ArchÉrt* 97 (1974) 109–115.
TÓTH J. A. 2006
Tóth J. A., *ÁsJel.*, Budapest, III. Dunameder, Aquincumi híd. (ER., Budapest III. Danube bed, Aquincum bridge) *Aqfüz* 12 (2006) 212–214.
TÖRÖK 1971
E. Török, Kornmorphologishe Untersuchung der Donau terassenkiese. *Periodica Polytechnica* 15 (1971) 51–66.
VÁMOS 2002
Vámos P., Fazekasműhely az aquincumi canabae déli szélén. (Potter's workshop at the Southern edge of the Aquincum canabae) [Budapest III, corner of Lajos Street–Nagyszombat Street] Theses. Archaeological Institute of ELTE, 2002.
VÁMOS 2006
P. Vámos, Excavation in the western cemetery of the Aquincum Military Town (Budapest III, 64 Bécsi Road) *Aqfüz* 12 (2006) 15–23.
VÁMOS 2007
Vámos P., *ÁsJel.*, Budapest, III. Bécsi út 66. [ER., Budapest III, 66 Bécsi Road]. *Aqfüz* 13 (2007) 262–263.
VARRO
Marcus Terentius Varro, *Rerum rusticarum libri tres*. Translated by W. D. Hooper – H. B. Ash http://penelope.uchicago.edu.
VETTERS 1994
W. Vetters, Der Taupo und Klima um 200 A.D. in Europa. In: *Markomannenkriege* 457–461.
VÉGH 2006, 2008
Végh A., *Buda középkori helyrajza* I–II. (Medieval Topography of Buda I–II) Monumenta Historica Budapestinensia XV–XVI. Budapesti Történeti Múzeum 2006, 2008
VICZIÁN – HORVÁTH 2006
Viczián I. – Horváth F., A tatai mocsarak a római korban és Mikoviny Sámuel lecsapoló munkája. (The Tata marsh in the Roman Period and the drainage work carried out by Sámuel Mikoviny) *Földr. Ért.* 55 (2006) 257–272.
VIRÁG 2009
Zs, M. Virág, Remains of Neolithic and Copper Age settlements in the Nánási Road (Budapest III, 75–77 Nánási Road). *Aqfüz* 15 (2009) 97–109.
VISY 1989
Visy Zs., *A római limes Magyarországon.* (The Roman Limes in Hungary) Akadémiai Kiadó, Budapest, 1989.
VISY 2000
Visy Zs., A Ripa Pannonica Magyarországon. (The ripa Pannonica in Hungary.) Budapest, 2000. See VISY 2003
VISY 2003
Zs. Visy, *The ripa Pannonica in Hungary*. Budapest, Akadémia Kiadó 2003
WEIN 1977
Wein Gy., *A Budai-hegység tektonikája.* (Tectonics of the Buda Hills) MÁFI Alkalmi Kiadv. Budapest, 1977.
WELLNER 1963
Wellner I., Újabb őrtorony az aquincumi limes-szakaszon. (Einer neuentdeckter Wachturm auf der Limesstrecke von Aquincum. Res.). *BudRég* 20 (1963) 303–310. [Budapest II, Lajos Street, Eastern side of the roadway, trench for thermal pipe between Zsigmond Square and Kolosy Square].
WELLNER 1968
Wellner I., *Az aquincumi Hercules villa.* (The Aquincum Hercules villa) Budapest, 1968. See WELLNER 1969.
WELLNER 1969
I. Wellner, The Hercules villa in Aquincum. *ActaArchHung* 21 (1969) 235–272.
WELLNER 1970
Wellner I., Az aquincumi helytartói palota építésének kora. (Zur Frage der Bauzeit des Statthalterpalastes von Aquincum. Res.). *ArchÉrt* 87 (1970) 116–125.
WELLNER 1971/1
Wellner I., Leletmentések az aquincumi canabae déli szélénél. (Bergungsgrabungen am südlicher Rand der Aquincumer Canabae. Res.). [Budapest II, North-Eastern corner of Lajos Street–Sajka Street] *BudRég* 22 (1971) 411–418.
WELLNER 1971/2
Wellner I., A magyarországi római kori épületek belső díszítőművészete. (The interior decoration of Roman Period buildings in Hungary) *Építés- és Építészettudomány* II/3–4 (1971) 327–400.

WELLNER 1972
Wellner I., *ÁsJel.*, Budapest, III. Szél u.–Szellő u. sarok. [ER., Budapest III, corner of Szél Street–Szellő Street] *RégFüz* 24 (1972) 27, No 36.

WELLNER 1973/1
Wellner I., Az aquincumi katonaváros nyugat–keleti irányú vízvezetékrendszere. (Das WO-orientierte Wasserleitungssystem der Aquincumer Militrstadt. Res.). [Budapest III, 44 Vörösvári Road; Szőlőkert Street; 22 Vihar Street. Vörösvári Road canal ditch: in front of 73–75 Vörösvári Road (pillared aqueduct); in front of 93 Vörösvári Road, at the corner of Körte Street; across the way at the corner of Vörösvári Road and Emese Street; 44 Vörösvári Road, cellar; corner of Korvin O. Street and Kiscelli Street; 125 Vörösvári Road] *BudRég* 23 (1973) 179–185.

WELLNER 1973/2
Wellner I., *ÁsJel.*, Budapest, III. Szél u. 32. [ER., Budapest, III. 32 Szél Street] BudRég 23 (1973) 268, No 47.

WELLNER 1973/3
Wellner I., Megjegyzések az aquincumi helytartói villacsoport keltezésének újabb adataihoz. (Bemerkungen zu neueren Angaben in Zusammenhang mit der Datierung der Statthalter-Villa von Aquincum. Res.) *ArchÉrt* 100 (1973) [1974] 222–223.

WELLNER 1976/1
Wellner I., *ÁsJel.*, Budapest, III. Búvár u. [csatornaárok] [ER., Budapest III, Búvár Street. channel-ditch]. *BudRég* 24 (1976) 418, No 89.

WELLNER 1976/2
Wellner I., *ÁsJel.*, Budapest, III. Meggyfa u.–Szél u. sarok. [ER., Budapest III, corner of Meggyfa Street–Szél Street] *BudRég* 24 (1976) 419, No 93.

ZABEHLICZKY 1994
H. Zabehliczky, Kriegs oder Klimafolgen in archäologischen Befunden? In: *Markomannenkriege* 463–469.

ZÓLYOMI 1952
Zólyomi B., Magyarország növénytakarójának fejlődéstörténete az utolsó jégkorszaktól. (The evolution of the vegetetion cover of Hungary from the last glacial period) *MTA Biol. Tud. Oszt. Közl.* 1. (1952) 491–543.

ZÓLYOMI 1958
Zólyomi B., Budapest és környékének növénytakarója. (The plant cover of Budapest and its environs) In: *Budapest természeti képe.* (The Natural Picture of Budapest) (eds. Pécsi M. – Marosi S. – Szilárd J.) Akadémiai Kiadó, Budapest, 1958. 511–639.

ZSIDI 1984
Zsidi P., *ÁsJel.*, Budapest, III. Szentendrei út, Schütz vendéglő előtt. [ER., Budapest III, Szentendrei Road, in front of the Schütz restaurant.] *BudRég* 25 (1984) 474, No 99.

ZSIDI 1990/1
P. Zsidi, Untersuchungen des Gräberfeldes der Militärstadt von Aquincum. *RLiÖ* 36/2 (1990) 723–730.

ZSIDI 1990/2
Zsidi P., Aquincum polgárvárosának városfala és védművei az újabb kutatások tükrében. (Stadtmauer und Verteidigungssystem der Zivilstadt von Aquincum im Spiegel der neuesten Forschungsergebnisse. Res.) *CommArchHung* (1990) 144–167. (167–169)

ZSIDI 1991
Zsidi P., Újabb villa az aquincumi municipium territoriumán (Budapest, III. Kaszás dűlő – Csikós utca). (Neuere villa am Territorium des Municipiums von Aquincum. Res.) (Budapest III, Kaszásdülő – Csikós Street) *BudRég* 27 (1991) 143–179.

ZSIDI 1993
Zsidi P., *ÁsJel.*, Budapest, III. Aquincum polgárváros (hrsz. 19668/3) [ER., Budapest III, Aquincum polgárváros /Civil Town/ (Lrn 19668/3)]. *RégFüz* 1/45 (1993) 33, No 49/2.

ZSIDI 1994
P. Zsidi, Die römische Villa von Kaszás dűlő – Csikós utca und die Frage der Villen im Territorium des Munizipiums von Aquincum (am Gebiet der heutigen Stadt Budapest). *Balácai Közlemények* 3 (1994) 292–311.

ZSIDI 1995/1
P. Zsidi, A Roman building outside the Southern city wall of Aquincum Civil Town [1993–94 excavations, Budapest III, 139 Szentendrei Road]. *Aqfüz* 1 (1995) 44–48.

ZSIDI 1995/2
P. Zsidi, Research on the Northeastern edge of the Aquincum *canabae*. [Budapest III, corner of Szentendrei Road – Ladik Street]. *Aqfüz* 1 (1995) 38–43.

ZSIDI 1996
P. Zsidi, Studies of Roman Period settlement density between the Civil and Military Towns in Aquincum (Budapest III, 1 Szőlőkert Street). *Aqfüz* 2 (1996) 63–68.

ZSIDI 1996–1997
Zsidi P., Temetőelemzési módszerek alkalmazása az aquincumi katonaváros északi temetőjének feldolgozásában. (The study of the Aquincum Military Town Northern cemetery employing cemetery analysis methodology) *ArchÉrt* 123–124 (1996–1997) 17–48.

ZSIDI 1997/1 [1998]
P. Zsidi, Grabummauerungen am nördlichen Rand der Canabae von Aquincum (Budapest III, Ladik Street). *CommArchHung* 1997 [1998] 109–153.

ZSIDI 1997/2
Zsidi P., A városkép változása az aquincumi polgárvárosban a 2–3. század fordulóján.(Changes in the townscape of the Aquincum Civil Town at the turn of the 2nd–3rd century AD) *BudRég* 31 (1997) 281–287. See **ZSIDI 2002/1**

ZSIDI 1997/3
P. Zsidi, Test excavation carried out South-East of the Aquincum Civil Town. (Budapest III, Óbuda Gas Factory). *Aqfüz* 3 (1997) 54–57.

ZSIDI 1998/1
P. Zsidi, Research on the Southern outskirts of the Aquincum Civil Town. (Budapest III, 101 Szentendrei Road). *Aqfüz* 4 (1998) 72–78.

ZSIDI 1998/2
P. Zsidi, ER., Budapest III, Gas Factory. *Aqfüz* 4 (1998) 91–92.

ZSIDI 1998/3
P. Zsidi, Remains of the Roman fortification system North of the Aquincum Military Town. (Budapest III, Filatorigát). *Aqfüz* 4 (1998) 65–71.

ZSIDI 1998/4
P. Zsidi, Aquincum all' epoca dell' imperatore Traiano. In: Traiano ai Confini dell' Impero. (Red. G. Popescu) Milano, 1998, 92–95.
ZSIDI 1999/1
P. Zsidi, Research along the Danube bank near the Aquincum Civil Town (Budapest III, Óbuda Gas Factory). *Aqfüz* 5 (1999) 84–94.
ZSIDI 1999/2
Zsidi P., Hídfőállás az aquincumi polgárváros és katonaváros között. [Budapest, III. Óbudai rkp. Hrsz., 18388] (Ein Brückenkopf zwischen der Zivilstadt und den Canabae von Aquincum. Res.) In: *BÖLCSKE* 1998, 257–274. (263–265)
ZSIDI 1999/3
P. Zsidi, Details of a Roman Period villa farm between the Military and Civil Towns in Aquincum (Budapest III, 6 Szőlőkert Street). *Aqfüz* 5 (1999) 99–108.
ZSIDI 1999/4
P. Zsidi, A late Roman Period burial site outside the Southern wall of the Aquincum Civil Town (Budapest III, corner of Záhony Street, the new Museum building). *Aqfüz* 5 (1999) 77–83.
ZSIDI 2000/1
P. Zsidi, Part of an Early Roman Defence System and a Stone Building from the 2nd–3rd Centuries North of the Aquincum Military Town (Budapest III, Filatorigát). *Aqfüz* 6 (2000) 62–75.
ZSIDI 2000/2
P. Zsidi, ER., Budapest III, Záhony Street, new Museum buiding. *Aqfüz* 6 (2000) 108–110.
ZSIDI 2000/3.
P. Zsidi, ER., Budapest III, 101–115 Szentendrei Road (former Házgyár, Tln.,19360, 19361). *Aqfüz* 6 (2000) 107–108.
ZSIDI 2001/1
P. Zsidi, Research in the territory East of the Aquincum Civil Town (Budapest III, 7 Záhony Street, Graphisoft Park, Building "D", in the territory of the former Óbuda Gas Factory). *Aqfüz* 7 (2001) 76–84.
ZSIDI 2001/2
P. Zsidi, Research in the Southern foreground of the Aquincum Civil Town II. (Budapest III, 101–115 Szentendrei Road). *Aqfüz* 7 (2001) 68–75.
ZSIDI 2001/3
P. Zsidi, Research into the settlement structure North of the Aquincum Military Town (Budapest III, former HÉV station Filatorigát). *Aqfüz* 7 (2001) 59–67.
ZSIDI 2002/1
P. Zsidi, Transformation of the town structure in the Civil Town of Aquincum during the Severi (A.D. 193–235) *ActaArchHung* 53 (2002) 131–149.
ZSIDI 2002/2
P. Zsidi, Tonköpfchen aus dem Herd eines awarenzeitlichen Wohnhauses (Budapest III, Filatorigát). *BudRég* 36 (2002) 341–362.
ZSIDI 2002/3
Zsidi P., Az aquincumi polgárváros délkeleti előtere az újabb kutatások tükrében. (Die südöstliche Vorraum der Zivilstadt von Aquincum in Spiegel der neueren Forschung. Res.). *BudRég* 35/1 (2002) 143–157.
ZSIDI 2002/4
Zsidi P., Aquincum polgárvárosa. (The Aquincum Civil Town) *MOYΣEYON*, Enciklopédia Kiadó, 2002
ZSIDI 2004
Zsidi P., Aquincum topográfiája. (Aquincum topography) *SpNov* 18 (2004) 167–226.
ZSIDI 2005
P. Zsidi, Die Änderung der Siedlungsstruktur in der Umgebung von Aquincum (Stadtgebiet von Budapest). *Balácai Közlemények* 9 (2005) 333–342.
ZSIDI 2006
Zsidi P., Az aquincumi polgárváros. Vezető az Aquincumi Múzeum romkertjében. (The Aquincum Civil Town. Guide to theAquincum Museum ruin area) *Aqzsebk* 1. Archaeolingua, without date
ZSIDI 2007
Zsidi P., A Duna szerepe Aquincum topográfiájában. (Die Rolle der Donau in der Topographie von Aquincum. Res.). *BudRég* 41 (2007) 57–83.
ZSIDI 2008
P. Zsidi, Wohnhaustypen und Struktur in der Zivilstadt von Aquincum. In: *DOMUS* 251–270.
ZSIDI – REMÉNYI 2003
P. Zsidi – L. Reményi, Detail from the road on the Danube bank and prehistoric remains South of the Civil Town. (Budapest III, Óbuda Gas Factory former civil tenants' apartments). *Aqfüz* 9 (2003) 86–94.
ZSIGMONDY 1866
Zsigmondy V., *Die im Pester Stadtwaldehen projektierte Behrug*. Jahrbuch d.k.k. Geol. R. Anst. 16. Verh. (1866) 20.

Abbreviations

AUGUSTUS – ATTILA	Von Augustus bis Attila. Leben am ungarischen Donaulimes. Limesmuseum Aalen,Zweigmuseum des Württembergischen Landesmuseums (Schriftleit. M. Kemkes) Hrsg. die Gesellschaft für Vor – und Frühgeschichte in Württemberg) Schriften des Limesmuseums Aalen 53. Stuttgart, 2000.
AQUINCUM 1942	Budapest Története I/1–2. (The History of Budapest) (ed. Szendy K.) Budapest, 1942.
AQUINCUM 1973	Budapest története az őskortól a honfoglalásig. Budapest története I. (The history of Budapest from Prehistoric Period till the Hungarian Conquest. Ed. Gerevich T.) Akadémia Kiadó Budapest, 1973.
AQUINCUM 1986	Das römische Budapest. Neue Ausgrabungen und Funde in Aquincum. Ausstellungskatalog. (Hrsg. H. Polenz) Münster/Lengerich, 1986.
AQUINCUM 1995	Gods, soldiers and citizens in Aquincum. An exhibition to celebrate the 100 year cetennial of the founding of the Aquincum Museum. (ed. P. Zsidi) Budapest, 1995.
AQUINCUM 2009	Visual Store at Aquincum. Catalogue of the permanent exhibition of the Aquincum Museum (eds. P. Zsidi *et al.*) Budapest, 2009.
BÖLCSKE 1999	Pannoniai kutatások. A Soproni Sándor emlékkonferencia előadásai.(Pannonische Forschungen, Vortrage der gedenkkonferenz für Sándor Soproni, Bölcske 1998.) Szekszárd, 1999.
BÖLCSKE 2003	Bölcske. Römische Inschriften et Funde. (Hrsg. Á. Szabó – E. Tóth.) Libelli archaeologici, Ser. nov. No. II. Budapest, 2003.
DOMUS	Das Haus in den Städten der römischen Donauprovinzen. Akten des 3. Internationalen Symposiums über römische Städte in Noricum und Pannonien. (Hrsg. P. Scherrer) Österreichisches Archäologisches Institut. Sonderschriften Band 44. Wien, 2008.
FORSCHUNGEN 2003	Forschungen in Aquincum 1969–2002. Aquincum Nostrum II. 2. (Hrsg. P. Zsidi) Budapest, 2003.
LIMES 1967	The Proceedings of the Seventh International Congress held at Tel Aviv, 1967. Tel Aviv, 1971.
LIMES 1974	Studien zu den Militärgrenzen Roms II. Vorträge des 10. Internationalen Limeskongresses in der Germania Inferior. Köln – Bonn, 1974. BJb Beiheft 38 (1977) Habelt, 1977.
LIMES 1983	Studien zu den Militärgrenzen Roms III. Vorträge des 13. Internationalen Limeskongresses, Aalen 1983. Forschungen und Berichte zur Ur- und Frühgeschichte in Baden-Württemberg 20, Stuttgart (1986)
LIMES 1986	Akten des 14. Internationalen Limeskongresses 1986 in Carnuntum. RLÖ 36 (1990)
LIMES 1989	Roman Frontier Studies 1989. Proceedings of the XVth International Congress of Roman Frontier Studies. 1989, Exeter (Ed. A. Maxfield and M. J. Dobson) University of Exeter Press, Exeter 1991.
LIMES 1995	Roman Frontier Studies 1995. Proceedings of the XVIth International Congress of Roman Frontier Studies. (Ed. W. Groenman-van Waateringe *et al.* Oxbow Monograph 91, Exeter, 1997.
LIMES 1997	Roman Frontier Studies XVII. 1997. Proceedings of the XVIIth International Congressof Roman Frontier Studies (Ed. N. Gudea) Zalau, 1999.
LIMES 2003	Procedings of the XIXth International Congress of Roman Frontier Studies. Pécs, Hungary, September 2003. (Ed. Zs. Visy) University of Pécs, 2005.
MARKOMANNEN-KRIEGE	Markomannenkriege. Ursache und Wirkungen. (Hrsg. H. Fiesinger – J. Tejral – A. Strupper) Brno, 1994.
PANNONICA	Pannonica. Provincialia et Archeologica. Studia sollemnia auctorum Hungarorum Eugenio Fitz octogenario edicata. (Hrsg. Á. Szabó – E. Tóth) Editio Musei Nationalis Hungarici Budapestini MMIII. LibArch Ser. Nov. No. I.
PANNONIA	La Pannonia e l'Impero Romano. (Atti del convegno internationale "La Pannonia e l'Impero Romano." Accademia d'Ungheria e l'Istituto Austriaco di Cultura. (Cura G. Hajnóczi) Annuario dell' Accademia d'Ungeria. Electa, Roma, 1994.
STÄDTE	Die norisch-pannonischen Städte und das römische Heer im Lichte der neuesten archäologischen Forschungen. II. Internationale Konferenz über norisch-pannonische Städte. Aquincum Nostrum II. 3. Budapest, 2005.
TOWN	The Roman Town in the Modern City. Proceedings of the International Colloquium held on the occasion of the 100th Anniversary of the Aquincum Museum 1994 Budapest. (Ed. M. Németh) Aquincum Nostrum 2 (1998)

Abb	Abbildung, Figure
ActaArchHung	Acta Archaeologica Academiae Scientiarum Hungaricae (Budapest)
Alba Regia	Annales Musei Stephani Regis (Székesfehérvár)
AM	Aquincum Museum
AnÉp	L'année Épigraphique (Paris)
ANRW	Aufstieg und Niedergang der Römischen Welt (Berlin – New York)
Antaeus	Antaeus. Communicationes ex Instituto Archaeologico Academiae Scientiarum Hungaricae (Budapest)
AntHung	Antiquitas Hungarica (Budapest)
APA	Acta Praehistorica et Archeologica (Berlin)
Aqfüz	Aquincumi füzetek (Budapest)
Aqzsebk	Aquincumi zsebkönyvek (Aquincum pocket guide) (Budapest)
ArchÉrt	Archaeologiai Értesítő (Budapest)
ArhKözl	Archaeologiai Közlemények (Budapest)
ÁsJel.	Excavation report
AT	Antik Tanulmányok (Studia Antiqua) (Budapest)
BAR	British Archaeological Reports, International Series (Oxford)
BJb	Bonner Jahrbücher des Rheinischen Landesmuseums in Bonn und Vereins von Altertumsfreuden in Rheinlande
Bp	Budapest
BTM	Budapesti Történeti Múzeum (Historical Museum of Budapest)
BudRég	Budapest Régiségei (Budapest)
CarnuntumJb	Carnuntum Jahrbuch (Graz)
CIL III	Corpus Inscriptionum Latinarum III (Berlin), a collection of Latin inscriptions, Vol. III. contains the Latin inscriptions of the Danube land (and of Asia Minor) (Berlin)
CommArchHung	Communicationes Archaeologicae Hungariae (Budapest)
DissPann	Dissertationes Pannonicae (Budapest)
ER.	Excavation report
ELTE	Eötvös Loránd Tudományegyetem (Universitas Budapestiensis de Rolando Eötvös Nominate)
FiA	Forschungen in Augst (Augst)
Fig.	Figure
FolArch	Folia Archaeologica (Budapest)
Földr. Ért.	Földrajzi Értesítő (Hungarian Geographical Bulletin) (Budapest)
Földt. Közl.	Földtani Közlöny (Bulletin of the Hungarian Geological Society) (Budapest)
FontArchHung	Fontes Archaeologici Hungariae (Budapest)
Germania	Germania. Korrespondenzblatt der Römisch–Germanischen Komission (Frankfurt am Main)
HAS	Hungarian Academy of Sciences
Hidr. Közl.	Hidrológiai Közlöny (Budapest)
Hidr. Tájékozt.	Hidrológiai Tájékoztató (Budapest)
HPS	Hungarian Polis Studies (Debrecen)
Hrsz., hrsz.	Lrn., lrn. or Tln.
ILS	Inscriptiones Latinae Selectae I–III (Szerk. H. Dessau) Berlin, 1893–1916)
Jahrbuch d.k.k. Geol. R. Anst.	Jahrbuch der Kaiserlich-Königlichen Geologischen Reichsanstalt
Kat. Nr.	Catalogue number
KJb	Kölner Jahrbuch (Köln)
LAVERNA	Beiträge zur Wirtschafts- und Socialgeschichte der Alten Welt (Berlin)
lh.	site, locality
LibArch Ser. Nov.	Libelli Archaeologici Ser. Nov. (Budapest)
LNV	highest water level
Lrn., lrn., Tln.	number of cadastral survey
Inv. No.	Inv. No., inventory number
m aA	meters above the Adriatic
m aB	meters above the Baltic
MÁFI	Magyar Állami Földtani Intézet (Hungarian State Geological Institute)
MittArchInst	Mitteilungen des Archäologischen Institut der Ungarischen Akademie der Wissenschaften (Budapest)
MKÉ	Múzeumi és Könyvtári Értesítő (Budapest)
MNM	Magyar Nemzeti Múzeum (Hungarian National Museum)
MTA Biol. Tud. Oszt. Közl.	MTA Biológiai Osztályának Közleményei (Budapest)

No	serial number
Not. Dign.	Notitia Dignitatum (a "register of titles and ranks" of the Late Roman military and civil administration)
Oikumene	Studia ad historiam antiquam classicam et orientalem pertinentia (Budapest)
p.	pagus, page
PRK	Pannonia régészeti kézikönyve (Archaelogical Handbook of Pannonia) (Eds. Mócsy, A. and Fitz, J.) Akadémiai Kiadó,
Res.	résumé, abstract
RégFüz	Régészeti Füzetek (Budapest)
RLiÖ	Der Römische Limes in Österreich (Wien)
SpNov	Specimina Nova (Pécs)
TBM	Tanulmányok Budapest Múltjából (Budapest)
Term. Tud. Közl.	Természettudományi Közlöny
TitAq	Tituli Aquincenses Volumen I. Tituli operum publicorum et honorarii et sacri. (Cura P. Kovács et Á. Szabó) Pytheas, Budapestini MMIX
Tyche	Beiträge zur Alten Geschichte, Papyrologie und Epigraphie (Wien) Editor's addendum

Sources and additional data of figures and pictures

Figures

Fig. 1. Geomorphological map of Aquincum and its wider surroundings in the Roman Period (compiled by Ferenc Schweitzer 2010)
Fig. 2. The occurrence of freshwater limestone (travertine) formations in the Buda Hills and surroundings as the appearances of one-time karst springs (Gyula Scheuer–Ferenc Schweitzer, 1988)
Fig. 3. The section of the freshwater limestone deposits at Rómaifürdő (Római Strandfürdő) (Gyula Scheuer – Ferenc Schweitzer, 1988)
Fig. 4. Main surface rocks constituting mountain and plain relief types in the surroundings of Aquincum (based on data by MÁFI and FTI compiled by Ágoston Juhász, 2009)
Fig. 5. Freshwater limestone (travertine) levels related to the valleys of the Buda Hills (Gyula Scheuer – Ferenc Schweitzer, 1988)
Fig. 6. Mineral composition of Danube sediments (after Endre TÖRÖK, 1971)
Fig. 7. Sub-types of karst springs at Buda and the geomorphological position of their sources (Gyula Scheuer – Ferenc Schweitzer, 1978)
Fig. 8. A profile of a point bar along the Danube in the Óbudai Island (István Viczián – János Balogh, 2009)
Fig. 9. Generalized ecological conditions of surfaces with different spatial position (Ágoston Juhász, 2005)
Fig. 10. Hydrographic map of the wider surroundings of Aquincum in the Roman Period (Ferenc Schweitzer – János Balogh, 2009)
Fig. 11. Hand-written map of the Danube section along Óbuda (G. Motsy, 1918). The position of bars suggests that there might be connection between Margaret Island and Fürdő Island in pre-Roman times (MOL maps of Council of governor-general, S 12 Div 13 No 483).
Fig. 12. One of the numerous groups of karst springs at Rómaifürdő which played an important part in the everyday life of Aquincum (after Ferenc Schreier, 1920)
Fig. 13. The Fürdő Island between Buda and Pest (József Szabó, 1857). On the Fürdő Island hatched boundary indicates the whole area of springs while encircled dots indicate the main groups of springs.
Fig. 14. Reconstructed geomorphological map of the Óbudai Island (Ferenc Schweitzer, 2010)
Fig. 15. Reconstructed geomorphological map of the Óbudai Island after the construction of the artificial channel (Ferenc Schweitzer, 2010)
Fig. 16. Settlement environmental map of Roman Period Aquincum (compiled by Katalin H. Kérdő – Ferenc Schweitzer 2010)
Fig. 17. The settlement structure of Aquincum in the 2nd–3rd centuries AD with the indication of present network of streets (Katalin H. Kérdő – Anikó Kovács – Mrs. A. Vándor). ***Villas*** represented on the inset: Csillaghegy-Pusztakúti Road; Mocsáros-dűlő;Kaszásdűlő-Csikós Street; 6 Szőlőkert Street; Testvérhegy; Testvérhegy Eastern slope. ***Decorated urban house or public building:*** Meggyfa Street building group; Szél Street–Szellő Street; Folyamőr–Búvár Street building group, the territory of the Folyamőr Street distillery; 14–16 Folyamőr Street; Buvár Street channel ditch; 2 Sorompó Street; 31–33 Laktanya Street (the so-called *praetorium* or shrine area); 1 Kő Street – 27 Laktanya Street – 43 Óbudai Quay (bath); 19–21 Laktanya Street (bath); 39–42 Szépvölgyi Road (the so-called Governor's villa or shrine area). ***Kilns:*** Mocsáros-dűlő; Arany-ditch (in the area of the Lókórház [horse hospital]); Papföld; Gas-Factory potter's settlement; Schütz Restaurant; 13–14 Laktanya Street (Buda III, elevated main); 166 Bécsi Road; Szőlőkert Street; 77–79 Kiscelli Street; 98 Kiscelli Street; 126–128 Bécsi Road; 124 Bécsi Road; 122 Bécsi Road; 120 Bécsi Road; 60–70 Zápor Street; 8-10 Selmeci Street; 76–84 Lajos Street; 71–89 Lajos Street; 38–42 Bécsi Road; 12 Bécsi Road – 11 Ürömi Road; 73 Kiscelli Street; 75

Kiscelli Street; 103–105 Vörösvári Road; 111–118 Vörösvári Road; 24–26 Hunor Street; 21 Hunor Street; 41 Szépvölgyi Road; 30 Pacsirtamező Street; 48–50 San Marco Street; 4–6 Ürömi Street. ***Springs***: Rómaifürdő; 6 Szőlőkert Street; Filatorigát; Árpád spring; Hajógyári Island; Bécsi Road. ***Cemeteries:*** Northern Civil Town; Western Civil Town (following the Arany Ditch); Eastern cemetery Civil Town (Gas Factory); Southern Civil Town (Házgyár); Northern Military Town (Kaszásdűlő–Raktárrét, Benedek Elek Street; Szőlőkert Street; Ladik Street); Western Military Town (Bécsi Road); along the *limes* road.

Fig. 18. The ground plan of the Civil Town of Aquincum (after Paula Zsidi). Bibliography: ZSIDI 2002/4, 32.

Fig. 19. The use of the territory East of the Civil Town, on the Danube bank (area of the former Gas Factory) (Paula Zsidi – Anikó Kovács – Mrs. A. Vándor)

Fig. 20. Building from the Roman Period in the foreground of the Civil Town (territory of the former Házgyár at Óbuda) (Paula Zsidi – Anikó Kovács – Mrs. A. Vándor)

Fig. 21. The area between the Civil Town and the Military Town (the environs of Filatorigát) (Paula Zsidi – Anikó Kovács – Mrs. A. Vándor)

Fig. 22. Directions of the Roman Period location of town boundaries (limitatio) and the places of villa estates on the slopes of the Buda Hills and in their foreground (made by Krisztián Kolozsvári after Paula Zsidi on the map of C.P. Vasquez). Bibliography: ZSIDI 2004, 225, 19.kép, ZSIDI 2005, 342, Abb. 7. Data of the map by C.P. Vasquez. (See picture 20).

Fig. 23. The main building of the villa estate excavated in the Mocsárosdűlő (Katalin H. Kérdő – Anikó Kovács after Erzsébet Márity – András Kikindai). Unpublished.

Fig. 24. Plan of the Kaszásdűlő – Csikós Street villa and its characteristic profiles (after Paula Zsidi – Katalin H. Kérdő – Anikó Kovács)

Fig. 25. The area of the Szőlőkert Street villa estate (Paula Zsidi – Anikó Kovács – Mrs. A. Vándor). (Budapest III, 1 Szőlőkert Street).

Fig. 26. Military fort at Óbuda in the 1st–3rd centuries AD (after Margit Németh). Bibliography: NÉMETH 2006/1, 22.

Fig. 27. The plan of the cavalry troop fort at Óbuda (in AD 73 after Margit Németh). Bibliography: NÉMETH 2006/1, 22.

Fig. 28. The legionary fortress and the North-Eastern quarters of the Military Town (Katalin H. Kérdő – Anikó Kovács – Mrs. A. Vándor after Margit Németh)

Fig. 29. The 4th century AD legionary fortress in Aquincum (after Margit Németh). Bibliography: NÉMETH 2006/1, 26.

Fig. 30. Part of the Southern region of the Military Town with the military amphitheatre (Orsolya Madarassy – Anikó Kovács – Mrs. A. Vándor)

Fig. 31. Erosion impact after the Roman Period. Within an undisturbed tomb built of stone slabs erosion or ground-water might cause the displacement of bones (4th century AD). (Budapest III, 6 Vályog Street) Excavation by Orsolya Madarassy. Drawing: Mrs. P. Czirják.

Fig. 32. The area South of the Military Town (Katalin H. Kérdő – Anikó Kovács – Mrs. A. Vándor after Tibor Hable). Bibliography: HABLE 2002, 278, Fig. 1.

Fig. 33. Part of the area South of the Military Town (Tibor Hable – Anikó Kovács – Mrs. A. Vándor)

Fig. 34. The whole *limes* section at Aquincum with the chain of Roman Period defence features (after the supplement of FORSCHUNGEN 2003, by Katalin H. Kérdő – István Asztalos – Anikó Kovács)

Fig. 35. The Wazpaur's map from 1764, completed by monuments from the Roman Period (after János Schauschek and Lajos Nagy, compiled by Anikó Kovács) Bibliograpy: the supplement by L. NAGY 1946.

Fig. 36. Roman Period buildings in the Hajógyári Island (Katalin H. Kérdő – Anikó Kovács – Mrs. A. Vándor) Bibliography: KÉRDŐ 2008, 287, Abb. 4.

Fig. 37. The ground-plan of the Governor's palace, with the functions of the premises (after Klára Póczy, Katalin H. Kérdő—Anikó Kovács—Margit Molnár). Bibliography: AQUINCUM 1986, 106, Fig. 41.

Fig. 38. Reconstructed image of the Governor's palace (computer illustration created by Krisztián Kolozsvári after Gyula Hajnóczi). Bibliography: HAJNÓCZI 1995, 63.

Fig. 39. Profile with the excavated pillars and occurrences of upwelling springs in the Hajógyári Island (Mrs. P. Czirják – Anikó Kovács – Margit Molnár). Archaeological excavation, Budapest, III, Hajógyári Island 1996, Katalin H. Kérdő. Collection of drawings of AM. Inv. No. 6982/97.

Fig. 40. The original margin of the island at the Western bank of the Hajógyári Cove in the profiles of the archaeological trial trench (Mrs. P. Czirják – Anikó Kovács – Margit Molnár). Archaeological excavation, Budapest III, Hajógyári Island 1996. Katalin H. Kérdő collection of drawings of AM, Inv. No. 6951/97.

Fig. 41. Archaeological profile and ground plan with the ditch of natural origin in the Hajógyári Island (Mrs. P. Czirják – Anikó Kovács – Margit Molnár). Archeological excavation, Budapest III, Hajógyári Island, 1998. Katalin H. Kérdő, collection of drawings of AM Inv. No. 7243/98.

Fig. 42. Ground-plan and profile with traces of a flood within the trial trench deepened in the area of the Southern surrounding wall and of the tower on the Hajógyári Island (Mrs. P. Czirják – Anikó Kovács – Margit Molnár). Archaeological excavation, Budapest III, Hajógyári Island 1998, Katalin H. Kérdő, collection of drawings of AM, Inv. No. 7256/98.

Fig. 43. Summary data of levels of the Governor's palace with the representation of the maximum water level (LNV) of the 1994 year flood (compiled and drawn by Katalin H. Kérdő – Anikó Kovács – Margit Molnár, after F. Schauschek – J. Szilágyi). Bibliography: SZILÁGYI 1971, 54, Fig. 1.

Fig. 44. Ground plan and archaeological profile of an abandoned streambed at Budaújlak (Margit Molnár after Erzsébet Márity – Mrs. P. Czirják). Archaeological excavation, 1992, Budapest III, 67 Bécsi Road. Bibliography: NYÉKHELYI—MÁRITY 1994, No 99/1.

Fig. 45. The sacred precinct of Aquincum, based on the group of buildings and aqueducts excavated in the area of the Római Strandfürdő. (Reconstruction by Gyula Hajnóczi. computer drawing created by Krisztián Kolozsvári). Bibliography: PÓCZY 1980/1, 106.

Fig. 46. Reconstruction of a Roman Period brick kiln excavated at Óbuda (drawn by Anikó Kovács after Csaba Bende). Bibliography: PARRAGI 1976/2, 53, Fig. 56.

Fig. 47. Archaeological localities of high priority mentioned in the text and represented in figures (Katalin H. Kérdő – Anikó Kovács)

Fig. 48. Reconstructed geomorphological map of the Óbudai Island with the location of the archaeological sites (Ferenc Schweitzer – Katalin H. Kérdő – Zoltán Havas – Tibor Kovács – Anikó Kovács)

Pictures

Picture 1. The quarter of Budapest named Óbuda, built on the remains of Aquincum. The via principalis and the side-walk with colonnade along it, with part of the Southern gate of legionary fortress in the background (Budapest III. Flórián Square). Photo: Péter Komjáthy

Picture 2. Brick kiln burning the material of Kiscelli Clay Formation. Roman Period brick kiln found in an excavation at Budaújlak (Budapest III, 12 Bécsi Road – 11 Ürömi Road). Excavation by Annamária R. Facsády. Photo: Péter Komjáthy

Picture 3. Products of landslides and solifluction processes in the Quaternary hollows of piedmont surfaces and higher terraces

Picture 4. A closing wall deformed by mass movement processes in the Roman Period in the area of the so-called Testvérhegyi villa. The entrance of the building. Excavation by Orsolya Láng. Photo: Orsolya Láng

Picture 5. Freshwater limestone quarry from the Roman Period on the Gellért Hill. Traces of quarrying in the Roman Period quarry excavated in the Southern part of the Gellért Hill. Excavation by Mária Pető. Photo: Levente Bartha, BTM, Prehistoric department, photo collection Inv. No. 17114

Picture 6. Part of the lower flood plain level of the Danube filled up with layers of alluvial sand, mud and clay having caused the infilling and rise of the lower flood plain level and of the

active flood plain. On the left side of the excavation there is the spot of a well from the early Roman Period (Budapest III, 4 Fényes Adolf Street – profile of a foundation pit). Excavation by Orsolya Madarassy. Photo: Péter Komjáthy

Picture 7. Bed filled up with sediments in the profile of an archaeological excavation at Budaújlak (Budapest III, 67 Bécsi Road). Excavation by Erzsébet Márity 1992. Photo: Péter Komjáthy

Picture 8. Remains of an alluvial cone accumulated by the Szépvölgyi Stream at the exit of the valley (Budapest III, 18–22 Szépvölgyi Street). Excavation by Annamária R. Facsády, 1998.

Picture 9. The sand of a point bar in the Óbudai Island. The alluvial sand is overlain by wind blow sand. Photo: István Viczián

Picture 10. On the surface consisting of greyish yellow sand with loessy silt the Roman Period bank section. running parallel with the Danube is clearly discernible as the dark stripe also enclosing the embankment (Budapest III, Gas Factory). Excavation by Paula Zsidi, 1998–1999. Photo: Péter Komjáthy

Picture 11. Yellowish white spring sediments formed by 1–2 cm thick ridges precipitated on the sand surface resulted by the activity of a karst spring in the excavation at Szőlőkert street. The surface was cut by graves of a later cemetery (Budapest III, 1 Szőlőkert Street), excavation by Paula Zsidi, 1998. Photo: Péter Komjáthy

Picture 12. Springs at the foot of the Gellért Hill. At low water stage the remains of the horst from which the thermal waters spring forth are discernible. Photo: István Poór

Picture 13. Sulphide precipitation of springs on the Kis Island at Óbuda. Spring located North of the main building of the Governor's palace. Excavation by Katalin H. Kérdő 1996. Photo: Péter Komjáthy.

Picture 14. Remains of the Roman Period aqueduct (*aquaeductus*) supplying the Civil Town and the Military Town with water and its short reconstructed section. Photo: István Poór

Picture 15. The so called well house No. 3 excavated in the area of Római Strandfürdő. Excavation by Klára Póczy, old photo, AM Photo collection, Inv. No. 995.

Picture 16. Open drainage canal of North–South direction in the Southern foreground of the Civil Town. Later, when the function of the place had changed, it was filled back and a grave was dug into it. Part of archaological excavation in the territory of the former Házgyár (Budapest III, 101–115 Szentendrei Road). Excavation by Paula Zsidi 2000. Photo: Péter Komjáthy

Picture 17. Calcareous crust precipitated concentrically on the roots of trees in the vicinity of karst springs in the Kis Island at Óbuda. From an archaeological excavation carried out in the Hajógyári Island in 1996. Excavation by Katalin H. Kérdő. Photo: Péter Komjáthy

Picture 18. Altar stone dedicated to the flowing Danube, from the Hajógyári Island. Bibliography: CIL III. 3416=10379=TitAq 46 AM Inv. No. 63.10.30. Photo Inv. No. AM 8767

Picture 19. Building inscription from 73 AD of the fort of a cavalry troop stationed at Aquincum. Bibliography: KÉRDŐ–NÉMETH 1993, NÉMETH 2006/1, 3. Photo: Péter Komjáthy

Picture 20. Detail of the map by Carlo Pino Vasquez from 1837 (from the collection of maps of the Kiscelli Museum). Bibliography: HOLLÓ 1994, 34–35, No. 10., Inv. No. 603. Photo: Judit Fáry-Szalatnyay

Picture 21. Traces of several repeated raising in level by the entrance front of the row of shops (*tabernae*) along the street of the Civil Town running in North–South direction (within the Archaeological Park in Aquincum). Photo: Péter Komjáthy

Picture 22. The remains of the mithraeum of Marcus Antonius Victorinus at the Civil Town (within the Archaeological Park in Aquincum). The Eastward inclination of the terrain was favourably used for the cave-like design of the shrine. Photo: Péter Komjáthy

Picture 23. Medical box from one the excavated graves in the area of the one-time Gas Factory at Óbuda (Budapest III, Óbuda, Graphisoft Park). Bibliography: AQUINCUM 2009, 149, No. 788, AM. Inv. No. 2000, 11. 4516. Photo: Péter Komjáthy

Picture 24. General view of the excavation from the North in the area of the former Házgyár at Óbuda. The Eastward inclination of the Roman Period level below the present-day horizontal surface is clearly visible (Budapest III, 101–115 Szentendrei Road). Excavation by Paula Zsidi, 2000. Photo: Péter Komjáthy

Picture 25. The dark stripe in the sandy-loessy subsoil is the remain of a timber-slot of the palisade within the territory of the former Házgyár at Óbuda (Budapest III, 101–115 Szentendrei Road). Excavation by Paula Zsidi, 2000. Photo: Péter Komjáthy

Picture 26. Well without lining in the Eastern, lower-lying area of the former Házgyár at Óbuda (Budapest III, 101–115 Szentendrei Road). Excavation by Paula Zsidi. Photo: Péter Komjáthy

Picture 27. Ruins of the excavated Roman Period villa was flooded by ground-water (Budapest III, Kaszásdűlő – Csikós Street). Excavation by Paula Zsidi. Photo: Péter Komjáthy

Picture 28. Fragment of a statue from the excavation in Szőlőkert Street (Budapest III, 6 Szőlőkert Street). Excavation by Paula Zsidi. Photo: Péter Komjáthy AM Inv. No. R2236

Picture 29. Burial place belonging to the building of the villa, surrounded by a wall. The wall of the burial enclosure was dug into a surface with ridges created by the acitivity of an earlier spring (Budapest III, 1 Szőlőkert Street). Excavation of Paula Zsidi, 1998. Photo: Péter Komjáthy

Picture 30. The Eastern gate of the legionary fortress of Aquincum (in present-day Budapest III, 7 Kórház Street). Photo: Péter Komjáthy

Picture 31. The Southern gate of the legionary fortress of Aquincum with part of the *via principalis dextra* (in present-day Budapest III, Flórián Square. Photo: Péter Komjáthy

Picture 32. The atrium of the house of a *centurio* (in present-day Flórián Square). Photo: Péter Komjáthy

Picture 33. Border of a lot filled back with clay bricks from the early Roman Period (Budapest III, 118–120 Lajos Street). Excavation by Orsolya Madarassy. Photo: Péter Komjáthy

Picture 34. Erosion impact, dump level of the Western industrial quarters (Budapest III, 54 Föld Street). Excavation by Orsolya Madarassy. Photo: Péter Komjáthy

Picture 35. Bird's view of the excavation of the house with *peristylium* in the Military Town (Budapest III, Folyamőr Street). Excavation by Krisztina Szirmai, 1981. Photo: Ilona Molnár

Picture 36. Part of a mosaic with the depiction of a bull from the house with *peristylium* (Budapest III, Folyamőr Street). Excavation by Krisztina Szirmai, 1981. Photo: Ilona Molnár

Picture 37. Part of a mosaic with the depiction of a horse from the building of the Folyamőr Street (Budapest III, 14–16 Folyamőr Street). Excavation by Györgyi Parragi, 1975. Photo: Ilona Molnár

Picture 38. Well-preserved frescoes from the one of the premises of the Folyamőr Street building with the representation of plant ornaments, veil and stork within oblong-shaped panels. The so-called wall-painting with stork during excavation (Budapest III, 14–16 Folyamőr Street). Excavation by Krisztina Szirmai, 1979. Photo: Ilona Molnár

Picture 39. Erosion impact after the Roman Period. Stripe of the ruins of the Western wing of a Roman Period building (Western walls undercut by erosion) (Budapest III, 34 Selmeci Street). Excavation of Orsolya Madarassy. Photo: Péter Komjáthy

Picture 40. Ruins of an aqueduct at Budaújlak (Budapest III, 38–42 Bécsi Road). Excavation by Erzsébet Márity. Photo: Péter Komjáthy

Picture 41. Ruins of a Roman Period building from an excavation at Budaújlak (Budapest III, 89 Lajos Street). Excavation by Tibor Hable, 2002. Photo: Péter Komjáthy

Picture 42. Roman Period well at Budaújlak (Budapest III, 9–17 Bokor Street – 5–7 Galagonya Street). Excavation by Tibor Hable, 1994. Photo: Péter Komjáthy

Picture 43. Remains of the road leading to the Southern gate of the amphitheatre of the Military Town (Budapest III, 5–7 Bokor Street). Excavation of Tibor Hable. Photo: Péter Komjáthy

Picture 44. Contra Aquincum. Part of the Northern wall and one of its towers from the North-East (Budapest V, Március 15 Square). Photo: Péter Komjáthy

Picture 45. The line of the river bank with a steep Eastward inclination is clearly visible in the Southern profile of the foundation ditch of the modern building "C" of Graphisoft Park, Óbuda). Excavation by Paula Zsidi, 1998–1999. Photo: Péter Komjáthy

Picture 46. Segment of the river bank with a steep sloping in a profile in the area of the former Gas Factory at Óbuda (Budapest III, Gas Factory). Excavation by Paula Zsidi, 1998–1999. Photo: Péter Komjáthy

Picture 47. Section of a pile construction and its trace on a surface in the stripe of the Roman Period embankment in the area of the former Gas Factory at Óbuda (Budapest III, Gas Factory). Excavation by Paula Zsidi, 1998–1999. Photo: Péter Komjáthy

Picture 48. Layers sloping steeply Eastwards from the stripe of the Roman Period embankment, with layers deposited by floods (in the area of former Gas Factory at Óbuda). Excavation by Paula Zsidi, 1998–1999. Photo: Péter Komjáthy

Picture 49. Photo taken during the excavation of the Szőlőkert Street villa estate. A steep Southward sloping of the Roman Period surface below the present horizontal terrain is clearly discernible (Budapest III, 1 Szőlőkert Street). Excavation by Paula Zsidi, 1998. Photo: Péter Komjáthy

Picture 50. End of a Roman Period stone channel which ran into the one-time Rádl Ditch. After the operation period of the channel the area, including the bank of the ditch, was used as a burial place (Filatorigát). Excavation by Paula Zsidi, 2000. Photo: Péter Komjáthy

Picture 51. Path of a road standing on poles along the Eastern side of the one-time Rádl Ditch. The one-time ditch is marked by the difference in colour caused by its modern time filling (Filatorigát). Excavation by Paula Zsidi, 2000. Photo: Péter Komjáthy

Picture 52. Moat of Roman Period defence works, which led into the bed of the one-time Rádl Ditch (Filatorigát). Excavation by Paula Zsidi, 2000. Photo: Péter Komjáthy

Picture 53. Map of Budapest from 1873 with the Hajógyári Island (from the collection of the Museum of Military History). Specialkarte von Ungarn. Hungary West from the Tisa River. Volume I. 1872–1877. Ref.: B IX. a. 531/4.

Picture 54. Altar stone dedicated to the Danube from the former Fürdő Island (from the collection of the Hungarian National Museum). Bibliography: CIL III. 10395=TitAq 45. MNM Inv. No. 138. 1873. Photo Inv. No. MNM R 11605

Picture 55. Remains of the Roman Period quay at the Western bank of the Hajógyári Cove. Photo: Attila J. Tóth

Picture 56. Detail of a painted wall from the Governor's palace (19th century drawing). Collection of drawings of the AM, Inv. No. 384

Picture 57. Reconstruction of part of a painted wall from the main building of the Governor's palace. (In the permanent exhibition of the Aquincum Museum). Photo: Péter Komjáthy

Picture 58. The original margin of the island at the Western bank of the Hajógyári Cove in the North-Eastern corner of the archaeological trial trench. Excavation by Katalin H. Kérdő, 1996. Photo: Péter Komjáthy

Picture 59. Segment of a natural river bed in the profile of the archaeological excavation in the Hajógyári Island. Excavation by Katalin H. Kérdő, 1998. Photo: Péter Komjáthy

Picture 60. Section of a Roman Period canal made of limestone in the area of the Római Strandfürdő. Excavation by Klára Póczy. Old photo, collection of photos of AM, Inv. No. 968.

Picture 61. An altar dedicated to Jupiter found *in situ*, from the so-called shrine in the area of the Római Strandfürdő. Excavation by Klára Póczy. Old photo, collection of photos of AM, Inv. No. 982.

Picture 62. The map of the whole territory of Buda with landmarks about 1770 (Collection of maps, BTM Kiscelli Museum Inv. No. 148). Photo: Judit Fáry-Szalatnyay. Bibliography: HOLLÓ 1994, No. 5. 18–19.

Picture 63. Remains of an aqueduct with twin tubes led inside a wall in the Military Town (Budapest III, 111–117 Vörösvári Road). Excavation by Anita Kirchhof, 2006. Photo: Anita Kirchhof

Picture 64. Traces of quarrying in the Roman Period quarry excavated in the Southern slope of the Gellért Hill. Excavation by Mária Pető. Photo: Levente Bartha, AM, Prehistoric Department, collection of photos, Inv. No. 17111

Picture 65. Hajógyári Island in Óbuda, centre of a Medieval estate in site 2. Excavations of Zoltán Havas – Anikó Tóth, 2009. Aerial photo: Gábor Rákóczi

Picture 66. Hajógyári Island in Óbuda, Roman Period ditches and rows of post-holes in site 3. Excavation by Zoltán Havas, 2009. Photo: Zoltán Havas.

Picture 67 Hajógyári Island in Óbuda, Arpadian Age village in site 5. Excavation by Zoltán Havas, 2008. Photo: Zoltán Havas

Picture 68. One of the enigmatic ditches during the excavation (Budapest III, 75–77 Nánási Road), Excavation by Zsuzsanna M. Virág, 2008. BTM Prehistoric Department, photo collection, Inv. No. 2010.14.0396. Photo: Zsuzsanna M. Virág

List of names and terms

accumulation – *accumulation, sediment*

Actaeon – mythological person, young hunter

aedilis – in towns where Roman law was in force, in the municipal council *(ordo decurionum)* this was the second duty next to the majors *(duumviri)*

Aelianus – Claudius Aelianus, an author who was born in Praeneste. He wrote his work entitled "On the nature of animals" in Greek at the turn of the 2nd–3rd centuries AD.

Aesculapius – son of Apollo, god of medicine

ala — auxiliary cavalry unit, consisting of 500 or 1,000 persons. Its soldiers were recruited from inhabitants of provinces who had no Roman citizenship.

ala Hispanorum I – name of an auxiliary cavalry troop (1st Hispanic cavalry troop)

ala I Hispanorum Auriana – name of an auxiliary cavalry troop. The attribute Auriana refers to a member of the Aurius family.

ala I Tungrorum Frontoniana – name of an auxiliary cavalry troop (1st Tunger cavalry troop). *Tungri* was the name of a tribe in the territory of Gallia, Belgica and Germania Inferior. The attribute *Frontoniana* refers perhaps to the first commandant of Equestrian order of the military unit.

ala camp – the camp of the auxiliary cavalry troop

Alhévíz and ***Felhévíz*** – In the Medieval Period two settlements, Alhévíz and Felhévíz were named after warm springs. The first one was formed at the port situated near the mouth of the Ördögárok (Ördög Ditch), and its name refers to the warm springs at the foot of the Gellért Hill. These springs are mentioned already in a document dated to 1298 ("de Creenfeld de *calidis aquis circa portum*"), though the expression Alhévíz itself appears the first time in a 1355 document (*inferioris calidis aquis*). The other settlement, Felhévíz, was formed at that port which was situated at the Northern side of the Várhegy (Castle Hill). It had got its name after the springs uprushing at the foot of the Rózsadomb. These springs appear in a 1339 year document as Hévízfő. Those streams which flew from these places into the Danube were the hot waters in the proper sense – Aque Calide. In a 1211 document this expression refers to a territory still independent from Buda (*"prima meta est inter Budam et Calidas Aquas"*) See VÉGH 2006, 2008.

alluvial cone – *a mass of material of conical shape accumulated in the bottom of a slope. This material rolled down, flowing on the slope under the influence of gravity. In this accumulation the grain-size increases from the tip of the cone towards its bottom.*

alluvial fan– *a fan-shaped accumulation of a large quantity of load of water-courses arriving from the mountains at a territory with slight inclination*

alluvial soil *(rough alluvial soil, alluvial soil with humus) – a soil type developed on flood plain deposits (sand, silt). Because of the floods the soil formation processes are frequently interrupted, thus the soil levels do not develop, therefore the alluvial soil is poor in humus, it has a dull colour*

amphitheatre –a theatre with circular or elliptical shape with gradins

apodyterium – dressing and undressing room of Roman baths

Apulum – today: Alba Iulia (Hung: Gyulafehérvár) (Romania)

aquaeductus – aqueduct, a building used first of all for the transmission of drinking water with the aid of gravitation

atrium – the central, roofless premise of the Roman house

Augusta Treverorum – today: Trier (Germany)

Ausonius – poeta doctus (312–382), tutor of the emperor Gratianus

auxilia – the collective name of auxiliary troops consisting mostly of persons without Roman citizenship

auxiliary camp/castellum – smaller camp or fort (for auxiliary troops or other minor military units)

Bad Deutsch Altenburg – see ***Carnuntum***

Baiae – today: Baia (Italy). A bathing resort in the Roman Period, to the North of Naples at a 15 km's distance, in the seaside of Campania. It was famous for its medicinal sulphur-springs

bar – *an elevation raised near the surface of the water or slightly above it, from the bottom of standing or flowing waters*

Barbaricum – territories outside the frontiers of the Roman Empire, inhabited by "Barbarians"
basilica – a building for legislation or other public proceedings as well as for commercial purposes
berma – a road, following the wall of the Roman camp from outside
Bononia– today: Vidin (Bulgaria)
Brigetio – today: Komárom-Ószőny (Hungary)
brown forest soils – *sorts of soils belonging to one of the main soil types. They developed as a result of the microclimate created by forests and arboreal plants, of the organic material produced by trees and getting annually to the ground as well as of the activity of the primarily fungal microflora which decompose this material. The biological, chemical and physical effects induced by microbiological processes resulted in the leaching, argillification and acidification of the soils as well as their division into levels*
Bükk II. climatic phase – *within the recent period of the history of the Earth (Holocene) it is the 2nd phase of the so-called Bükk period, started at about 800 BC. Its climate as compared to the Bükk I. (Subatlantic) climatic phase (a period between 2500–800 BC.) was becoming somewhat warmer, drier and more continental (the fluctuation of temperature increased). The oak, and together with it the majority of mountainous elements from the margin of the Alföld retired to the neighbouring mountains and hills. The present-day Hungarian flora and vegetation were developed*
Caerleon – today: Bulmore (Great Britain, South Wales)
canabae – means "barracks, huts". Military town. A settlement of civilians established on a military territory beside the camps of legions
Capitoline Triad – the three deities worshipped in the Capitoline temple: Jupiter, Juno, Minerva
cardo (maximus) – the N–S direction main street of towns and military camps
Carnuntum – the chief town of Pannonia Superior (Upper Pannonia). The Civil Town was in the place of present-day Petronell, while the military town and the legionary camp were in the place of present-day Bad Deutsch Altenburg (Austria)
castellum – camp of auxiliary troops
Castellum contra (montem) Teutani and ***Castellum contra Teutanum*** – a supposed place name, it means: a camp opposite to the Teutanus Hill
castra – the camp or fort of the legion
castra legionis – legionary camp
Castra Regina – today: Regensburg (Germany)
cella trichora – it means a 'trefoiled cell', a type of Early Christian funerary chapels with a characteristic ground-plan, consisting of three semicircular apses and a quadratic entrance part
Cenozoic *(Neozoic) – the new phase of the evolution of the world of animals, in the Tertiary and Quaternary periods. It is the age of the rapid breeding of mammals, it started 67 million years ago and still goes on*
centurio – a troop officer who was the commander of a company of a legion and of a cohors
chernozem soil – *a thick soil, rich in nutrients, at the humus level, with a crumby structure and having an excellent productive capacity. It used to develop on loose rocks with calcareous content (loess) in half humid territories with continental climate, under a grassy steppe vegetation*
Cibalae – today: Vinkovci (Croatia)
cohors – company of a legion or independent auxiliary troop of infantrymen
Coh VII Breucorum – the VII. cohors recruited from the *breuci* tribe. (Breuci was a Pannonian tribe at the boundary of Pannonia and Dalmatia)
collegium – a mutual aid society or a society established for public purposes founded mostly by persons having the same occupation
colonia – originally a Roman town established by colonization. In the Imperial Period refers to towns of higher rank
Colonia Aelia Septimia Aquincum – the official name of Aquincum after obtaining the rank of colonia (194 AD)
Colonia Agrippinensis – today: Cologne (Germany)
Columella – Lucius Iunius Moderatus Columella, an author born in Hispania who lived in the 1st century. We have knowledge of his works entitled "On agriculture" (*De re rustica*) and "On trees" (*De arboris)*

consul – originally the highest position of the Roman Republic, in the Imperial Period, however, it is rather a title of senators during their career for a shorter time. After fulfilling his duty the consul could be the governor of provinces of importance

consularis – a former consul, member of senatorial order

contact spring – *the place where artesian water comes on the surface. The interruption of aquifers could be attributed to faults, outcropping layers or to the impermeable layer. They have ascending, descending and hydrostatic types*

Contra Aquincum – the name of a Roman Period fort in the left bank of the Danube. Its ruins are situated in district V. of Budapest, in Március 15 Square

contubernium – a community of those soldiers who lodge together in the barracks of military camps (8 persons). The word itself means also the section of dwelling place consisting of a room and an entrance-hall

Coriolis power – *a force of inertia, named after the French physicist and engineer G. G. Coriolis. This power in the Northern Hemisphere diverts N–S direction water-courses and bodies moving freely (e.g, masses of air, pendulum, cannon balls) to the right and in the Southern Hemisphere diverts S–N direction water-courses and the above-mentioned bodies to the left*

cornice – part of an entablature, protruding on the face of the wall

cryoturbation – *a turbulence of frost, mixing up with frost, which is characteristic of permafrost territories. It is a transport, stirring of material directed vertically, the mixing up of sediments resulted by the pressure effect of freezing and refreezing*

Dachstein limestone – *a light-coloured Triassic limestone with stratified-bedded structure, named after the Dachstein Mountains (Austria)*

Dacia – a Roman province, more or less in the territory of present-day Romania

Dacians – an Indo-European people, cognated to Getae, which lived in the territory of Oltenia, Banat and later in Transylvania. They flourished in the 1st century BC

decumana – the main street perpendicular to the cardo

decumana front the rear front of the military camp, see also *retentura, via decumana*

decurio – member of the municipality council, the commander of a minor cavalry unit (*turma*) in the army

deductio – ("leading away"), the word refers to a momentum of the foundation of a colonia, when colonists were commanded into their new town. The settling of veterans (earlier of Roman citizens) into colonia with allotment

deflation depression – *a depression formed by the wind. It is closed from each side, it is characteristic usually of half-fixed wind-blown sand territories of large extension*

Deianeira – a mythological person, wife of Hercules

delta *(river delta)* – *a wide delta-shaped mouth of a river flowing into a stagnant water (lake, sea or gulf), created by the own load of the river, where the river flows in several branches into the recipient*

dendrochronology – an age determination method based on the analysis of wooden material

dendrology – a branch of sciences dealing with historical wooden material

derasion – *processes of mass movements in slopes, going together with the transport of material and with the denudation of the relief. For derasion the most favourable conditions can be found in periglacial territories*

deversorium – inn

Diana – the daughter of Jupiter and Latona (first wife of Jupiter), the sister of Apollo. The goddess of the Moon, hunting, birth and enchantment

Dirké – a mythological person, the aunt of Antiopé who treated cruelly her niece. Therefore Antiopé's sons (Amphion and Zethos) tied Dirké by her hair to the horn of a bull and killed her in this way

domesticated landscape – *a natural landscape which bears also the marks of the conscious creative activity of Man (e.g. buildings, objects)*

Drusus – Drusus junior, the son of the emperor Tiberius, a general

Dura Europos – today: Kalat-as-Saalhia (Syria), a significant town in the bank of Euphrat River

dux – a commander-in-chief in the Late Roman Period

Eravisci – Celtic tribe in North-Eastern Pannonia. Their tribal centre was most probably on the Gellért Hill in Budapest

erosion – Sensu strict: *it is used to denote the devastating effect of linear activity of rivers.* Sensu lato: *the comprehensive, scientific name of the denuding activity of external (exogenous) powers*

erosion graben – *a linear form within the network of water-courses. Its width and depth range between 1 and 15 m. It has a role in the uprush of springs and in the development of streams, erosion valleys with permanet water-course*

fabrica – workshop

fault tectonics – *that type of tectonics which can be characterized by the fault shifts of rocks (escarpment, tectonic step created by faulting, fault line)*

Felhévíz – see ***Alhévíz***

flamen – a sacerdotal post. Originally they formed one of the oldest sacerdotal assemblages of Ancient Rome, they were in charge of keeping alive the sacrificial flame

Flavii – an imperial dynasty: Vespasianus, Titus, Domitianus (69–96 AD)

flood-plain – *an area along the two sides of water-courses, in most part of the year it is free from water. It is flooded by the water-course in case of high water. Usually lower flood plain and upper flood plain levels are distinguished*

flood-plain lowland – *area with slightly undulated surface which was formed by the sediments deposited near the river beds. Active flood plain is the name of that stripe of land which is situated between the dyke and the river-bed*

flood with ice-drift – *a flood induced by the damming force of an ice-barrier created by the breaking up of the ice of rivers*

Floralia – the feast of the goddess Flora, a springtime feast

foederati – allied peoples

Fortuna – the unforeseeable goddess of fortune

forum – the main square of towns, a market place. The most important (administrative, religious, commercial, etc.) public buildings, too, were situated there. It was also the name of the central square of military camps

fossa – shelter-trench, ditch

Fossatum magnum – the Medieval name of the one-time Danube bed in the line of present-day Nagykörút (Grand Boulevard) in Budapest. (It means 'large ditch'.)

freshwater limestone – *a sedimentary rock of fluvial or lacustric origin, or developed in caves, consisting essentially of $CaCO_3$ minerals, e.g. calcareous tufa (travertino), lake marl*

geomorphology *(a morphology of surfaces, reliefs)* – *a branch of sciences dealing with the analysis, development, classification and mapping of the forms of the surface of the Earth*

geomorphological map – *a map representing the surface forms and processes related to the surface*

Germanic tribes – Indo-European tribes living to the North of the territory of Celtic tribes

Glacial – see ***Ice Age***

gravel terrace – *gravel material deposited by a stream or by a river, in which later the water-course cuts a new bed for itself by linear erosion. It frequently occurs in caves as well*

groma – an instrument used to mark out trying square in the course of land-measuring

groma point – the starting point marked out by surveyors (the central point of a camp or of a town, the point of intersection of main roads)

ground-water – *the first subterranean water layer till 20 m, which is situated over the impermeable layer and fills in the empty space among the soil grains. The upper level of this mass of water is called ground-water table, its height depends on precipitation, temperature and pressure conditions*

ground-water spring – *the place of the uprush of the ground-water on the surface, where the surface cuts the slanting rock material of the impermeable layer or of the weathered layer and the ground-water accumulated over it and flowing towards the slope*

Hauptdolomite – *the light-coloured, usually well-stratified sediment of the Norian stage of the Alpine Triassic*

Hercules – a mythological hero, the son of Jupiter and Alcmene. He is famous first of all of his at least 12 works

Holocene – *the youngest phase of the Quaternary period, started at about 10,000 years ago, including also the present time (earlier it was called alluvium)*

***horreum* (*horrea*)** – granary, (granaries)

horst – *a block, formation of a mountain, elevated conspicuously above its environs, standing out at a higher position and bordered by structural fault planes (fault planes), more or less parallel to each other at each side e.g. the Sas Hill at Buda). (In Hungarian it is called "Sasbérc")*

Hydatius* or *Idatius – he was born at the end of the 4th century AD in Lemica, in Galicia (today Xinzo de Limia, Spain), from 427 he was the bishop of Aquae Flaviae (today: Chaves, Portugal). He was a chronicler. According to researches he died approximately after 468

hydrogeography *(geography of waters) – a branch of general natural geography, it deals with the development of the surface characteristics of waters, their role, behaviour, activity in the geographic sphere*

Hygieia – the goddess of health

hypocaustum – a place with several columns below the floor of a room, the air heated up in the outer heating-space circulates in it

Ice Age *(Glacial period) – glaciation periods of the history of Earth. Usually they lasted for several million years while between them there were considerably long, warmer periods (interglacials). Besides the glaciations in the Algonkium, Carboniferous and Permian periods the Pleistocene glaciation had the greatest significance. In our country, according to the Alpine system, five glacial periods can be distinguished within the Pleistocene (Donau, Günz, Mindel, Riss, Würm)*

Illyrs – an Indo-European people, which during its settling, occupied the Dalmatian coast of the Adriatic Sea and its hinterland

Illyricum – a Roman province. The probable date of its organization as a province is 188–117 BC. In the decades around the beginning of our era, in the time of the occupation of the valleys of the rivers Drava and Sava it was still called Illyricum, later it was divided into two provinces, that is Dalmatia and Pannonia

imbrex – ridge-tile

insula – a regular block of houses, bordered by streets

IOM (Iovi Optimo Maximo) – the abbreviation of the address of Jupiter, the supreme god of Romans in the inscriptions of stone monuments (it means: 'To the best and mightiest Jupiter')

Jazygians – a Sarmatian tribe which settled in the Danube–Tisza Interfluve area around the beginning of our era

Juno – goddess, the wife of Jupiter

Jupiter – the supreme god of Romans

Kikeritó – a territory belonging to the community Öskü (Veszprém County). It is famous of the remains of a supposed Roman time weir and sluice system

landslide – *a type of mass movements in slopes, without a transporting medium, a quick, sudden shift of the material of slopes along a so-called slip plane under the influence of shear powers. Sometimes a sort of it is distinguished, called slump, when landslide happens in a homogeneous material on a sloping territory*

Lares militares ("military Lares") – tutelary gods venerated by soldiers

lateral erosion *(lateral levelling) – a process during which the river undercuts the material of the bank in the external curve thus widening its flood-plain*

Lauriacum – today: Lorch-Enns (Austria)

Leda – a mythological person, the wife of Tyndareus, the mother of Castor, Pollux and Clytaemnestra, whom Jupiter (Zeus) made pregnant in the shape of a swan

legatus Augusti ("the delegate of an emperor") – a governor at the head of the provinces, the personal representative of the emperor

legio – an élite unit of the Roman army, consisting of professional soldiers (of about 6,000 persons)

legio II Adiutrix – the name of a military troop ("2nd auxiliary legion")

limes – the land frontier, later the entire frontier of the Roman Empire (its original meaning: 'road, ridge')

limitatio – the marking out of lots

lithosoil – *in the development of this soil type the conditions of biological processes are present only to a slight degree or only for a short time, therefore their effect is restricted*

loess – *a rock formed of dust grains transported by wind which has a loose structure, though it is stabile. It consists mainly of quartz (60–70%), feldspar (10–20%) and calcareous (1–20%) grains*

Lucullus – Lucius Lucullus, a person mentioned also by Pliny the Elder (Plin. Hist. Nat. IX.170). His fish-ponds were in Bauli (today Bacoli), not far to the South from the famous ancient resort, Baiae. (Their remains are visible even today.)

macellum – market-hall, shops around a courtyard with *peristylium*

magister militum – commander of parts of the army in the Late Roman Period, the highest degree of military ranks

Markomani – a Germanic tribe to the North of Pannonia, approximately in the territory of present-day Bohemia. In the last decade BC they occupied Boiohaemum, the land of the Middle European Boii tribe

meander – *a river-bend with a curvature larger than a semicicle (180°)*

mesoclimate – *a separate climate over an area with the extension of a few km² (e .g. a town or a hillside, etc.)*

Mesozoic *(period) – the middle period of the history of the Earth, lasting for 183 million years (between 260 and 67 million years), which is divided into three periods (Triassic, Jurassic, Cretaceous)*

mesozoic – *(a rock) developed in the Mesozoic period*

microclimate – *the specific climate of a very small air-space (e.g. a closed room or the cavity of a cave), with the extension of only a few m² which fundamentally differs from the climate of its environs*

Minerva – the daughter of Jupiter, the goddess of science, art and art of war

Mithras – a sun-god of Iranian origin

mithraeum – the shrine of Mithras

Moesia – a Roman province. Moesia Superior (Upper Moesia) extended over the territories of present-day Serbia, Kosovo, Macedonia, Albania and Bulgaria while Moesia Inferior (Lower Moesia) extended over part of the territories of present-day Bulgaria and Romania.

Mons Teutani – the mountain of Teutanus, according to some hypotheses the name of the Gellért Hill in the Roman Period

Mosella – today: Mosel (a river in Germany)

municipium – a Roman town with independent administration

Municipium Aelium Aquincum – the official name of Aquincum between obtaining the rank of municipium (under the rule of Hadrianus) and 194 AD

negative mills – *ascending type springs The coming of subterranean karstic waters on the surfaces of Mesozoic rocks where the overlying impermeable layer is missing. Due to hydrostatic pressure or to the ascensional power of gases in them, their water gets the surface from a considerable depth, their discharge is not significant*

Neptunus – the brother of Jupiter, the lord of the seas

Noricum – Roman province in part of the territory of present-day Austria and Slovenia

Notitia Dignitatum – a historical source from the Late Roman Period. The list of titles and ranks of both the military and civil administration for the whole territory of the Empire divided that time into two parts

nummuline limestone – *limestone developed in the Eocene period created by the accumulation of the rock-forming mass of the calcareous tests of large-size protozoans (nummulites)*

oppidum – a fortified settlement

opus incertum – a type of Roman Period wallings, consisting of stones put together erratically

opus spicatum – a type of Roman Period wallings, in Hungarian it is called herring-bone pattern walling or spike pattern walling

ordo – here: order, class, corporation

Ovidius – Publius Ovidius Naso (43 BC–17 AD), the greatest poet of the Augustan period

ox-bow lake *(stagnant water, mortlake) – a bend of river, cut off naturally or artificially*

palisade – poles, stockade

paludal soils *(paludal meadow soils) – the soils of water-courses, inundated areas, and of territories covered by water either permanently or rather frequently. They develop on those areas where the ground-water raises on the surface. Their organic material content predominates over their mineral components. Their vegetation consists of reed, sedge and bulrush*

Pannonia – Roman province, occupied under the reign of Augustus, then organized in the time of the Claudian or Flavian dynasties. Its territory included Transdanubia in Hungary and certain parts of Eastern Austria, Northern Croatia, Northern Serbia. About 106 AD Hadrianus divided it into two parts (Upper and Lower Pannonia)

Pannonia Inferior – Lower Pannonia, a Roman province, included more or less present-day Transdanubia and the Danube–Sava Interfluve, about 106 AD it became independent by the division of former Pannonia into to parts

Pannonia Superior – Upper Pannonia, a Roman province, included more or less the Eastern part of present-day Austria and part of Croatia. About 106 AD it became independent by the division of former Pannonia into two parts

Pannons – a people related to Illyrians, they lived in the Drava–Sava Interfluve and to the South of it

pars rustica – the farm part of the manor-house (*villa rustica*)

pars urbana – that part of the manor-house where the dwelling-place, bath, etc. of the owner was

Pátka – a community in Fejér County (Hungary). The remains of a Roman Period stone weir are known between communities Pátka and Csalapuszta

Pausias – a painter of Sicyon, the most famous master of encaustic painting (applying burning in technique with wax), who worked in the middle of the 4th century BC. The Elder Pliny, too, mentions him in his work (Nat. Hist. XXXV. 123–127, 137). Sicyon was a town near Corinthus, it was one of the centres of Greek art

pediment – *the surface of the piedmont area*

pedimentation – *a way of levelling of surface characteristic of semi-arid territories. In a classical sense it means the slow retreat of slopes in the margin of the mountains in warm, semi-arid territory.*

periglacial – *a territory covered by ice or which is near to the ice-cover*

peristylium – a courtyard surrounded by a portico with colonnade

permafrost – *an area permanently frozen*

Petronell – see ***Carnuntum***

piedmont surface – *a half-plain, sloping outwards, developed at the feet of mountains by the retreat of slopes, in warm, semi-arid territories. It cuts the rocks building up the mountains and the erosion products deposited in their foreground at almost the same angle.*

Pleistocene – *the first, older phase of the younger period of the history of Earth (Quaternary), preceding the Holocene. It lasted from 2.5 till 0.01 million years*

podium temple – a Roman temple standing on a substructure, and usually could be approached indirectly by steps

point bar – *a bar consisting of cross-bedded sediments which had accumulated in the form of ridges with an arch-like arrangement. They are parallel to each other and are situated in the inner side of the bends of rivers*

Porolissum – today: Mojgrad (Romania)

porta decumana – the gate in the rear front of the legionary camp

porta praetoria – the gate in the first (facing the enemy) front of the legionary camp

porta principalis dextra – that gate of the legionary camp which facing the enemy is in the right side

porta principalis sinistra – that gate of the legionary camp which facing the enemy is in the left side

porticus – a corridor with colonnade

porticus villa – a type of villas: a villa with a corridor with colonnade

praefectus – superior, principal, commander. In general in the Roman Period the title of persons of equestrian or senatorial rank nominated to the head of any (civilian or military) post

praefurnium – oven, the exterior heating place of floor heating

praeses – governor in the Late Roman Period, the civilian leader of the province from the 3rd century AD

praetentura – the front part of the camp, the territory between the *via principalis* and *porta praetoria*

praetor – the highest rank succeeding the consul, a high-ranking official. Originally praetors' duty was to work in legal administration, later they frequently acted the part of governors of minor rank. (The meaning of the word is: 'who walks in front' – from here: superior, principal)

praetoria front – the frontal part of the military camp, facing the enemy (see also ***praetentura***)
praetorium – originally the tent of the supreme commander. The dwelling place of the commander of the troop within the military camp
praetorius – a former *praetor*
prata legionis – the pasture of the legion, the military area around the legionary camp
principia – the central building, building of command of the military camp
projection – a section of the front protruding from the face of the front
Propina – the inscription of decorated Roman glasses (it means: 'to your health')
provincia – province, an administrative unit in the Roman Period
Quadi – Germanic tribes in the territory of Moravia
Quaternary – *the youngest phase of the history of Earth, the last 5 million years. Today it is called also Anthropogene. It is divided in two phases, Pleistocene (between 2.5 and 0.01 million years) and Holocene (from 0.01 million years up to now)*
quaestor – an official in charge of financial affairs in the Roman Period
Raetia – a Roman province, in part of the territory of present-day Austria, Germany and Switzerland
retentura – the rear front of the camp, the territory between the *principia* and the *porta decumana*
river terrace – see ***terrace***
Roxolonai – Scythian tribes
sand forms – *surface formations created by wind on unfixed wind-blown sand. In the territory investigated also half-fixed sand forms (blow out dune, longitudinal blow out dune, parabolic dune, coastal dune and barrier dune) are the characteristic ones*
Sarmatian – a nomad people of Iranian origin
Sarmatian-Iazygians – see ***Jazygians***
Satyr – mythological person, a companion of Bacchus
scamnum – a row of buildings, the territories bordered by the *via principalis* and the streets parallel to it. In the majority of legionary camps the *praetentura* consisted of two *scamna*, while the *retentura* consisted of three ones
senator – member of the senate, the highest degree of the Roman social scale
Silvanus – The god of forests
Sirmium – today: Sremska Mitrovica (Hung. Szávaszentdemeter) (Serbia)
Sol Invictus – "Invincible Sun " (the address of Mithras)
slope sediment *(deluvium) – hardly sorted or even unsorted sediment accumulated in the lower section of a slope. Its material is originated from the rocks and/or soil of the slope broken up into little bits or from the weathering of these rocks/soil*
solifluction *(a flow of soil) – on the slopes of periglacial territories a complicated movement of the masses of humid debris of molten tundra in the direction of the slope*
spitzgraben – a ditch with a pointed bottom
spolia – loot, spoils of war, here: ancient stone monument used as building material for later construction
Strabon – an expert writer in geography and history (63 BC –19 AD), he wrote in Greek, his compendium of geography entitled *Geographika* is known for us
stylus – a writing utensil used to write with it on wax tablets
tabernae (plur.) – shops
tectonics *(structural geology) – a branch of Earth sciences which deals with the movements of the Earth's crust, as well as with the causes and results of these movements*
tegula – a flanged roofing tile
terminus ante quem – before a certain point of time
terrace *(river terrace) – a stepped, edge-like plane, following the side of the river valleys. The cause of its development is the repeated permanent alteration of the character of the reach of the rivers at the same place*
terra sigillata – a special type of ceramics, luxury vessel
terrazzo – a cast floor made of brick-grist and lime
territorium – territory, estate

territorium legionis – the territory, estate of the legion

Tertiary period – *the first, older phase of the younger period (67–2.6 million years) of the history of Earth (Cenozoic), including also Paleogene and Neogene periods*

tetrarchy – ("the rule of four persons"). On the basis of the conception of the emperor Diocletianus the government of the empire was distributed between two augusti and two caesars, subordinated to them, from the nineties of the third century

Teutanus *(Teutates)* – the supreme god of the Eraviscan tribe

thermae maiores – "large bath" (here the bath of legio II Adiutrix in the Flórián Square at Óbuda)

thermal spring – *a spring of natural origin, its water is warmer than 20 C°*

thermal waters *(terma, natural hot water) – collective designation opf tepid (subthermal, till 25 C°) and warm (more than 25 C°) waters yielded by springs or streams (in Hungarian "héviz")*

Tomi – today: Constanța (Romania)

topography – *a branch of sciences dealing with the description of a certain territory (country, land, mountains, etc.) and with the surveying, of the surface of the Earth as well as with the determination of its forms. It belongs to geography*

Transaquincum – a fort on the left bank of the Danube, opposite to the legionary camp of Aquincum

tribunus lacticlavius – an officer of senatorial rank of the legion

Trier (Germany) – its name in the Roman Period was Augusta Treverorum

Ulcisia Castra – today: Szentendre (Hungary)

Valeria – a Roman province created by the division of Pannonia into four parts

valetudinarium – hospital

Varro – Marcus Terentius Varro (116–27 BC), a specialist of agriculture. The title of his most important work is *"De agricultura"* (On agriculture)

Vetera Castra – today: Xanten (Germany)

veteranus – a soldier dismissed from military service after an active service of 20–25 years

vexillatio – a task-force established from a single troop or from several ones for a certain purpose

via decumana – the road dividing the *decumana* front into two parts, which led from the rear side of the principia towards the *porta decumana* (rear gate)

via praetoria – the road dividing the *praetoria* front into two parts, which led from the *principia* towards the *porta praetoria* (frontal gate, main gate)

via principalis – a main road dividing the camp into two parts in its full width, it is perpendicular to the *via decumana.* It connected the *porta principalis sinistra* (left side gate) with the *porta principalis dextra* (right side gate)

via sagularis – a road leading around the camp along the wall of the camp, inside the camp

Victorinus – Marcus Antonius Victorinus, member of the municipal council of Aquincum in the beginning of the 3rd century, *aedilis,* later *duumvir.* Several altars erected by him came to light in Aquincum. His villa was found in the outskirts of Budaörs (Hungary) where a significant hoard of coins was found

vicus – a settlement with no independent rights. Among others it is the name of civilian settlements developed around the camps of auxiliary troops *(vicus militaris)*

vicus militaris – see ***vicus***

villa – generally a house, cottage in the country

villa urbana – a distinguished house in the town

villa rustica – centre of a rural estate with dwelling-house, outhouses

Vitruvius – Marcus Vitruvius Pollio, a specialist of architecture in the Augustan period, a military engineer (end of the 1st century BC – beginning of the 1st century AD). Its work entitled *De architectura libri* X ("Ten books on architecture") is the only special work written on architecture known for us from Antiquity

wind-blown sand – *sand, set in motion by wind in barren surfaces. Its grains are rounded to a greater degree than the ones of sands transported by water or ice*

Dynasties and emperors mentioned in this volume in the chronological order of their reign

Julius-Claudius dynasty (27 BC–68 AD)
Augustus (27 BC–14 AD)
Tiberius (14–37)
Claudius (41–54)

Vespasianus (69–79)
Domitianus (81–96)
Traianus (97–117)
Hadrianus (117–138)
Marcus Aurelius (161–180)
Commodus (180–192)

Severan dynasty (193–235)
Septimius Severus (193–211)
Caracalla (211–217)

Decius (249–251)
Gallienus (253–268)
Probus (276–282)
Diocletianus (284–305)
Constantinus I (Great) (306–337)
Licinius-Augustus (co-emperor, 308–324)
Constantius II (337–340)
Valentinianus I (364–375)
Gratianus (375–383)

Governors mentioned in this volume

Undivided Pannonia
Calpetanus Rantius Quirinalis Valerius Festus (73)

Pannonia Inferior
P. Aelius Hadrianus (106–108)
L. Cornelius Latinianus (127–130)
M. Iallius Bassus Fabius Valerianus (156–157)
Ti. Haterius Saturninus (161–164)
Caius Valerius Sabinianus (185–187/88)
L. Baebius Caecilianus (199, 202)
L. Alfenus Avitianus (214–216)

Valeria
Frigeridus dux, military commander-in-chief (374–377)

A concordance table of data of levels

Budapest/ district	Locality	m aB	m aA	Name	Figure or Profile	Page
I	Lánchíd, Buda water gauge	94.97	95.65	0 point of Buda water gauge		122
III	Hajógyári Island at the Small Bridge	95.38	96.60	0 point of Óbuda water gauge		
III	Hajógyári Island	96.23	96.92	Bottom of the canal leading to the Hajógyári Basin after the first dredging in 1835–36		122
III	67 Bécsi Road	96.28	96.95	The bottom of the deepened part during the excavation of the old bed	47/34., 32/21., 44.	
III	76–84 Lajos Street	96.33	97.00	Bottom of a Roman Period well	47/31., 32/17., 33.	
III	9–19 Bokor Street	97.18	97.85	Bottom of a Roman Period well	47/32., 32/18., 33.	
III	21–25 Bokor Street	97.85	98.52	Bottom of a Roman Period ditch	47/30., 32/16., 33.	
III	74 Lajos Street	98.21	98.88	Bottom of a Roman Period well	47/36., 32/19., 33.	
III	69–71 Bécsi Road	98.33	99.00	Roman Period ditch	47/34.	
III	21–25 Bokor Street	98.40	99.07	Bottom of a Roman Period ditch	47/30., 33.	
III	70–74 Szőlő Street	98.47	99.14	Bottom of Northern trough-shaped fossa	47/78.	
III	70–74 Szőlő Street	98.69	99.36	Bottom of Southern trough-shaped fossa	47/78.	
	Pole constructions	98.94	99.62	Pole constructions. bridge-heads at the margins of draining ditches for inland water and of one-time bed remains	17.	47
III	Óbudai Quay–bridge-head	98.95	99.62	Roman Period wall. lower wall-top when the direction of the wall changed. identical with the top of the poles	47/105., 17., 21.	
III	74 Lajos Street	98.97	99.64	Roman Period well	47/36., 33.	
III	70–74 Szőlő Street	99.01	99.68	Bottom of middle fossa (Spitzgraben)	47/78.	
III	Hajógyári Island	99.16	99.83	Bottom of a natural ditch	41.	
III	Kő Street	99.22	99.89	Roman Period canal	47/82., 28/28.	
III	9–19 Bokor Street	99.32	99.99	Bottom of a Roman Period pit	47/32., 33.	
III	Kő Street	99.48	100.15	Roman Period canal	47/82., 28/28.	
III	12–22 Harrer Pál Street	99.55	100.22	Roman Period fossa	47/81., 28/18.	
III	9–19 Bokor Street	99.73	100.40	Bottom of a Roman Period pit	47/32., 33.	
III	70–74 Szőlő Street	99.85	100.52	Digging in surface of a fossa (Spitzgraben) at the South, between the two fossae	47/78.	
III	Lajos Street 76–84.	99.91	100.58	Roman Period road	47/31., 32/17., 33.	
III	Lajos Street 76–84.	99.92	100.59	Roman Period road	47/31., 17., 32/17., 33.	122
III	Hajógyári Island	99.95	100.64	Deepest point of the survey of 26. October 1835 (4.98 m)		122
III	118–120 Lajos Street	100.01	100.68	Roman Period well	47/41., 30/12.	

Budapest/ district	Locality	m aB	m aA	Name	Figure or Profile	Page
III	Hajógyári Island	Over 100.00	Over 100.68	Upper flood plain level in the island		44
III	9–19 Bokor Street	100.03	100.70	Bottom of a Roman Period post-hole (horreum)	47/32., 33.	
III	118–120 Lajos Street	100.03	100.70	Roman Period drainage ditch	47/41., 30/f.	
III	70–74 Szőlő Street	100.03	100.70	Digging in surface of a fossa (Spitzgraben) at North	47/78.	
III	Tavasz Street	100.12	100.79	Fossa at the SE corner	28/18.	
III	Óbudai Quay. bridge head	100.14	100.81	Roman Period wall, at the Northern side of the Southern wall	47/105., 17.	
III	70–74 Szőlő Street	100.24	100.91	Digging in surface of a Southern trough-shaped fossa, at South	47/78.	
III	12–22 Harrer Pál Street	100.25	100.92	fossa	47/81., 28/18.	
	Terrain suitable for constructions	100.32	101.00	Terrain suitable for constructions		47
III	67 Bécsi Road	100.33	101.00	Roman Period floor level	47/34., 17.	
III	71–89 Lajos Street	100.33	101.00	Roman Period well	47/37., 32/29.	
III	70–74 Szőlő Street	100.43	101.10	Pipe of a Roman Period aqueduct	47/78.	
III	Óbudai Quay–bridge-head	100.51	101.18	Roman Period N–S direction lower wall	47/105.	
III.	71–89 Lajos Street	100.63	101.30	Roman Period level	47/37., 32/29	
III	Filatorigát	100.77	101.44	Roman Period spring	47/104., 21.	
III	Hajógyári Island	100.99	101.66	Roman Period pulled down wall-top, the arched wall of the tower at the closing wall	47/86., 42.	
III	70–74 Szőlő Street	101.02	101.69	Remained top of a Roman Period road	47/78., 28/18.	
III	Szőlőkert Street villa estate. 1 Szőlőkert Street	101.03	101.7o	Early Roman Period paved floor level	17., 25.	
III	Hajógyári Island	101.04	101.71	Roman Period level. inner floor level of tower (cellar?)	17., 36/6.	
III	Gas Factory	101.07	101.74	Bottom of a Roman Period bunch of poles	47/112., 19.	
III	Szőlőkert Street villa estate. 6 Szőlőkert Street	101.08	101.75	Edge of terrain	47/107., 25.	
III	Szőlőkert Street villa estate. 6 Szőlőkert Street	101.10	101.77	Subsoil with traces of uprushing spring	47/107., 25.	
III	Gas Factory	101.20	101.87	Bottom of a Roman Period bunch of poles	47/112., 19.	
III	Filatorigát	101.24	101.91	Southern bank of Rádl Ditch before filled up	47/104., 21	
III	Szőlőkert Street villa estate. 6 Szőlőkert Street	101.30	101.97	spring	47/107., 17., 25. Profile 5/ borehole 484.	
III	Aquincum – Civil Town	101.31	101.98	Northern defence ditch of the Civil Town, SE from amphitheatre	47/114.	

Budapest/ district	Locality	m aB	m aA	Name	Figure or Profile	Page
III	80–86 Bécsi Road	101.33	102.00	Roman Period graves, end of 1st century, beginnig of 2nd century	47/28., 47/29.	95
III	Szőlőkert Street villa estate. 6 Szőlőkert Street	101.35	102.02	Levelling of rubbish with stones	47/107., 25.	
III	3–11 Pacsirtamező Street	101.38	102.05	Roman Period road	47/38., 30/d.	
III	54 Föld Street	101.47	102.14	Roman Period wattle-and-daub layer	47/68.	
III	Szőlőkert Street villa estate. 1 Szőlőkert Street	101.49	102.16	Roman Period pulled down wall-top	47/107., 25.	
III	Hajógyári Island	101.50	102.17	Roman Period level, S from the main building. inner floor level	17., 36	
III	Filatorigát	101.52	102.19	Roman Period canal lid, outside the building	47/104., 21.	70
III	Gas Factory	101.54	102.21	Roman Period defence work, bottom	47/112., 19.	
III	Szőlőkert Street villa estate. 6 Szőlőkert Street	101.55	102.22	Base of a Roman Period burial enclosure, pulled down wall-top	47/107., 25.	
III	3 Vályog Street	101.58	102.25	Roman Period well	47/73.	
III	123 Bécsi Road	101.64	102.31	Roman Period level, floor level (inside a building)	47/50., 17., 30/3.	
III	123 Bécsi Road	101.64	102.32	Roman Period level, level of the appearance of a defence work	47/50., 30/3.	
III	34 Selmeczi Street	101.65	102.32	Roman Period floor level	47/55., 30/1.	
III	22 Szőlő Street	101.64	102.32	Roman Period inner floor level	47/52., 17., 30/5.	
III	Filatorigát	101/68	102.35	Roman Period canal lid, outside the building	47/104., 21.	70
III	74 Kiscelli Street	101/68	102.35	Roman Period floor level	47/63., 17.	
III	Hajógyári Island	101.70	102.37	Roman Period road at the N side of the main building	47/86., 17., 36.	
III	127 Bécsi Road	101.73	102.40	Roman Period post-hole. Early Period defence works	47/51., 30/2.	
III.	Corner of Fényes A. Street and Timár Street (Police)	101.73	102.40	Romen Period level	47/44., 30/7.	
III.	21 Tímár Street	101.77	102.44	Roman Period inner floor level	47/48., 17., 30/6	
III	3–11 Pacsirtamező Street	101.81	102.48	Roman Period road	47/38., 30/d.	
III	118–120 Lajos Street	101.88	102.55	Roman Period road	47/41., 30/f.	
III	Hajógyári Island	101.90	102.57	Roman Period wall-top, Southern closing wall at the tower	36/6., 42.	
III	75 Kiscelli Street	101.93	102.60	Roman Period inner floor level (red floor)	47/65.	
III	60–70 Zápor Street	101.93	102.60	Roman Period floor level	47/67., 17.	
III	Szentendrei Road – Házgyár	101.94	102.62	Roman floor level	47/109., 20.	
III	122 Lajos Street	102.03	102.69	E–W direction Roman Period road	47/42., 17., 30/e. Profiles 11 and 20/ borehole 176	

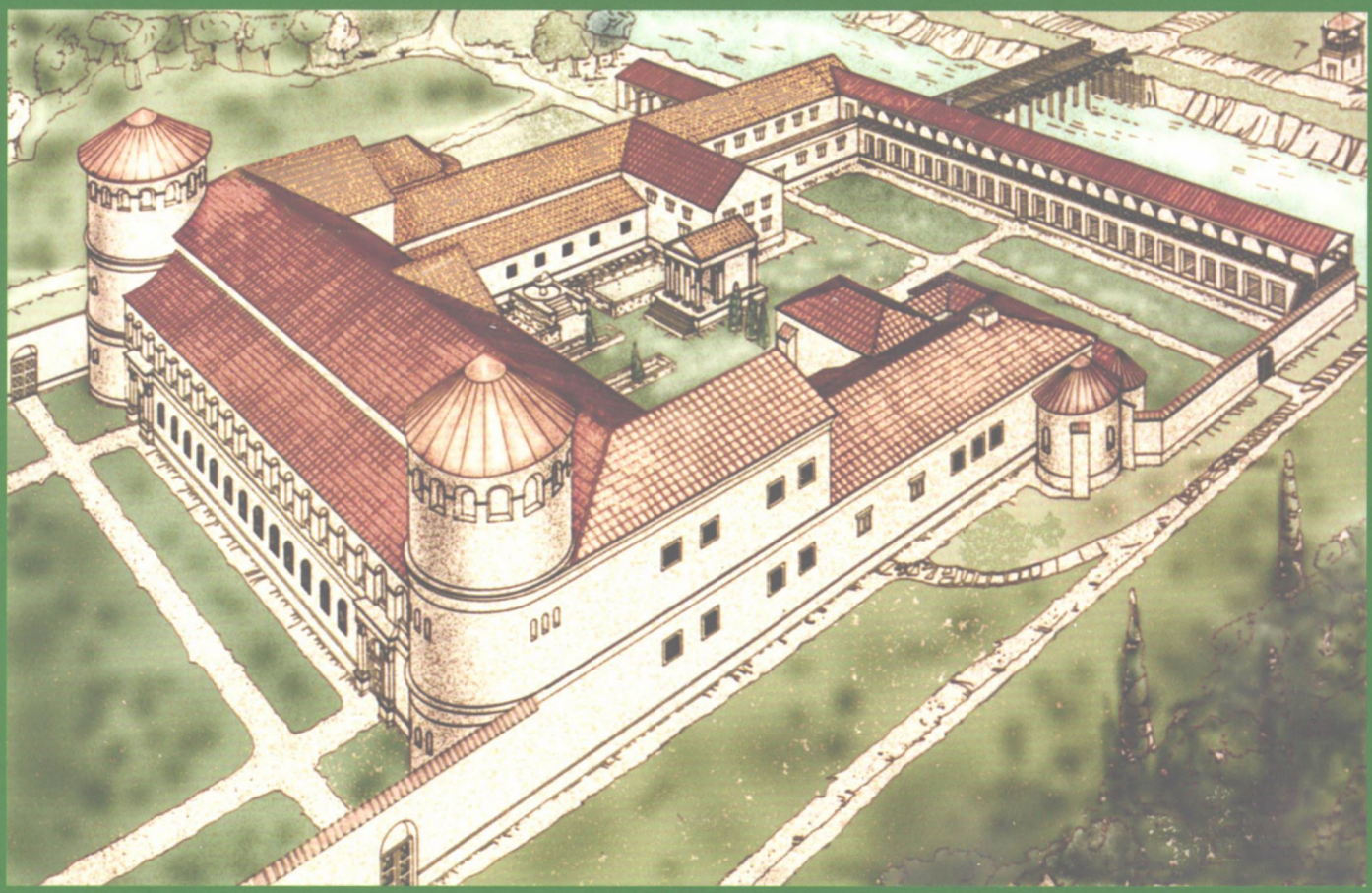
Budapest/ district	Locality	m aB	m aA	Name	Figure or Profile	Page
III	Hajógyári Island	102.03	102.70	Roman Period level. S from the main building. inner floor level	17., 36.	
III	71–89 Lajos Street	102.03	102.70	Limes road	47/37., 32/29.	98
III	118–120 Lajos Street	102.06	102.73	Roman Period level. inner level	47/41., 30/12.	
III	Filatorigát	102.07	102.74	Roman Period canal lid, inside the building	47/104., 21.	70
III	Gas Factory	102.08	102.75	Roman Period feature. top of an Early Period pole construction	47/112., 19.	
III	12–22 Harrer Pál Street	102.13	102.80	Roman Period road following the camp wall from outside. NE corner	47/81., 28/18.	
III	74 Lajos Street	102.13	102.80	Roman Period ditch	47/36., 33.	
III	Filatorigát	102.15	102.82	Roman Period bathroom. top of terrazzo	47/104., 21.	70
III	122 Lajos Street	102.17	102.84	Roman Period level. terrazzo floor of a building	47/42., 30/13.	
III	Gas Factory	102.21	102.88	Roman Period road	47/112., 17., 19. Profile 4/ borehole 373	
III	71–85 Lajos Street	102.23	102.90	Roman Period road	4/37., 17. Profile 20/ borehole 272	
III	Aquincum – Civil Town	102.25	102.92	Bottom of a Roman Period defence ditch at NE gate-tower	47/114.	
III	165–167 Lajos Street	102.31	102.98	Roman Period road, ala camp, via sagularis	27.	
III	Hajógyári Island	102.33	103.00	Roman Period inner floor level. main building, Eastern wing	47/86., 17., 36., 43.	
III	167 Bécsi Road	102.36	103.03	post-hole	47/62.	
III	25–26 Dévai B. M. Square	102.39	103.06	Roman Period level. inner floor level	47/53., 30/4.	
III	165–167 Lajos Street	102.41	103.08	Roman Period road, among the barracks of the ala camp	27.	
III	Szentendrei Road – Házgyár	102.41	103.08	Roman Period floor level	47/109., 17., 20.	
III	12–24 Harrer Pál Street	102.43	103.10	Roman Period road	47/81., 28.	
III	7 Zsófia Street	102.43	103.10	Roman Period road	47/115., 17. Profile 2/between boreholes 240 and 248	
III	Szentendrei Road – Házgyár	102.47	103.14	Early Roman Period feature	47/109., 20.	
III	Gas Factory	102.49	103.16	Early Roman feature. bottom of a timber slot	47/112., 19.	
III	Szentendrei Road – Házgyár	102.49	103.16	Bottom of a Roman Period ditch	47/109., 20.	
III	Castra Legionis	102.53	103.20	Roman Period level, terrazzo floor of a bath basin	47/79., 28.	

Budapest/ district	Locality	m aB	m aA	Name	Figure or Profile	Page
III	23–31 Lajos Street	102.58	103.25	Limes road	47/5., 17., 32/32. profile 20/ borehole 413	
III	Óbuda	102.58	103.25	Highest Danube level (LNV) 1994, 760 cm		123
III	Castra Legionis	102.72	103.39	Roman Period road. via praetoria	47/79., 17., 28/B. Profile 9/between boreholes 973 and 985	
III	Szentendrei Road – Házgyár	102.72	103.39	Bottom of an Early Roman Period feature	47/109., 20.	
III	52 Bécsi Road	102.73	103.40	Roman Period road, S direction parting of a 2nd century dirt road	47/21.	95
III	Castra Legionis	102.73	103.40	Intersection of via sagularis and via praetoria	47/79., 17., 28/B. Profile 20/ borehole 996	
III	4 Fényes A. Street	102.76	103.43	Roman Period level. floor level at the E side of the limes road	47/39., 17., 30/11.	
III	Gas Factory	102.81	103.48	Modern time features	47/112., 19.	
III	13 Vályog Street	102.81	103.48	Roman Period level. floor	47/74., 17. Profile 9/ East from borehole 973	
III	12–24 Harrer Pál Street	102.82	103.49	Roman Period road	47/81., 28.	
III	8 Vályog Street	102.83	103.50	Roman Period wall	47/72.	
III	Szentendrei Road – Házgyár	102.84	103.51	Top of a Roman Period ditch	47/109., 20.	
III	39 Kunigunda Street	102.85	103.52	Roman Period road	47/102., 17.	
III	Hajógyári Island	102.87	103.55	Highest surface, on Oct.26. 1835		122
III	14 Vályog Street	102.93	103.60	Roman Period inner floor level	47/75., 17. Profile 9/ West from borehole 973	
III	Corner of Fényes A. Street and Timár Street (Police)	102.98	103.65	Roman Period outer floor level	47/44., 30/7.	
III	Gas Factory	102.98	103.65	Appearance level of Roman Period defense ditch	47/112., 19.	
III	Legionary camp	103.oo	103.68	Floor level of legionary fort		47
III	Szentendrei Road – Házgyár	103.01	103.68	Roman Period wall-top at the E part	47/109., 20.	
III	Castra Legionis	103.07	103.74	Roman Period level, E from horreum	47/79., 28/12.	
III	70–74 Szőlő Street	103.07	103.74	Modern time surface 1974	47/78., 28/18.	

Budapest/ district	Locality	m aB	m aA	Name	Figure or Profile	Page
III	3 Vályog Street	103.10	103.77	Roman Period floor level (courtyard)	47/73., 17.	
III	Aquincum – Civil Town	103.13	103.80	Roman Period level, SE from the amphitheatre, at the S side of the defense ditch	47/114., 17. Profile 2 /between boreholes 246 and 248. Profile 20/ West from borehole 270	
III	Hajógyári Island	103.13	103.80	spring	47/86., 17., 36.	
III	Szentendrei Road – Házgyár	103.13	103.80	Roman Period level, top of the infilling of the moat, at the SW part of the area	47/109., 17., 20.	
III	Aquincum – Civil Town	103.15	103.82	Base part of Roman Period aqueduct, N from the N gate	47/114.	
III	Castra Legionis	103.17	103.84	Roman Period road, bordering the principia from the West	47/79., 17., 28/1.	
III	Castra Legionis	103.17	103.84	Roman Period road, bordering the principia from the South	47/79., 17., 28/1.	
III	Gas Factory	103.18	103.85	Roman Period feature, appearance level of Early Period remains	47/112., 19.	
III	Szentendrei Road – Házgyár	103.22	103.89	Roman Period level at the Western edge of the area in 1997	47/109., 20.	
I	Lánchid, Buda water gauge	103.24	103.92	827 cm flood. 2010.06.08. (LNV)		123
III	Szentendrei Road – Házgyár	103.28	103.95	Wall of a Roman Period burial enclosure	47/109.	
III	Aquincum – Civil Town	103.30	103.97	Roman Period level with gravel. N from the N gate	47/114.	
III	Szentendrei Road – Házgyár	103.33	104.00	Roman Period feature. the appearance of palisade wall at the W part of the area	47/109., 20.	
III	Gas Factory	103.36	104.03	Present surface	47/112., 19.	
III	Szentendrei Road – Házgyár	103.39	104.06	Roman Period level at the NW part of the area	47/109., 20.	
I	Lánchid, Buda water gauge	103.45	104.13	848 cm flood. 19. August. 2002 (LNV)		13
III	Bécsi Road, hillside	103.53	104.20	Roman Period road, 2nd century dirt road running on the hillside parallel to the W side of Roman burial enclosures		95
III	19–21 Meggyfa Street	103.54	104.21	Roman Period road	47/95., 28/19.	
III	12–24 Harrer Pál Street	103.65	104.32	Limes road, North from the NE corner of castra legionis	47/81., 17., 28. Profiles 9 and 20/ borehole 912	
III	Szentendrei Road – Házgyár	103.69	104.36	Roman Period walls	47/109.	

Budapest/ district	Locality	m aB	m aA	Name	Figure or Profile	Page
III	19–21 Meggyfa Street	103.73	104.40	Inner floor level of Roman Period building	47/95., 17., 28/19	
III	12–24 Harrer Pál Street	103.75	104.42	Roman Period road North from the NE corner of castra legionis	28.	
III	12 Bécsi Road – 11 Ürömi Road	103.83	104.50	Roman Period road	47/9., 17., 32/15.	
III	Aquincum – Civilian Town	104.02	104.69	Lid of a Roman Period canal at the NE gate-tower	47/114.	
III	Mocsárosdűlő	104.12	104.79	Roman Period level	47/119.	
III	Aquincum – Civil Town	104.15	104.82	Roman Period wall, at NE gate-tower	47/114.	
III	Aquincum – Civil Town	104.23	104.90	Lowest Roman Period destruction layer in the forum	47/114.	
III	46–52 Bécsi Road	104.33	105.00	Roman Period road	47/21., 17., 32/10.	
III	Bécsi Road, hillside	104.33	105.00	N–S direction Roman Period road with a gravel cover		95
III	25–29 Kecske Street	104.33	105.00	Roman Period graves, end of 1st century. beginning of 2nd century	47/26., 47/27.	95
III	Mocsárosdűlő	104.33	105.00	Top of a Roman Period wall	47/119., 17.	
III	Aquincum – Civil Town	104.41	105.08	Roman Period road at the N gate of the Civil Town	47/114., 17. Profile 2/ East from borehole 270	
III	4 Vályog Street – 189 Bécsi Road	104.48	105.15	Top of a Roman Period wall	47/70.	
III	Aquincum – Civil Town	104/72	105.39	Latest Roman Period level at the forum	47/114. Profile 2/ borehole 270	
III	Szentendrei Road – Házgyár	104.80	105.43	Present level	47/109.	
III	Aquincum – Civil Town	105.20	105.87	Roman Period road. Street C in the line of the deversorium	47/114., 17. Profiles 4 and 20/ borehole 357	
III	Aquincum – Civil Town	105.53	106.20	Modern time level, at present. Street C in the line of the deversorium	47/114.	
III	Aquincum – Civil Town	105.63	106.30	Modern time level. at present at the NE gate-tower	47/114.	
III	Aquincum – Civil Town	105.81	106.48	Present level, N from the N gate	47/114.	
III	38–42 Bécsi Road	105.93	106.60	Roman Period aqueduct	47/15., 17., 32/11.	
III	Pusztakúti Road	106.97	107.64	Roman Period level	47/121., 17.	
III	Pusztakúti Road	106.97	107.64	Roman Period level	47/121., 17.	
III	Pusztakúti Road	107.34	108.01	Roman Period pulled down wall-top	47/121.	

Budapest/ district	Locality	m aB	m aA	Name	Figure or Profile	Page
II	18–22 Szépvölgyi Road	107.65	108.32	Infilling layer of Szépvölgyi Ditch mixed with gravel. its lowest point observed		125
III	7 Kecske Street	110.13	110.80	Skeleton found at the highest point		95
III	Testvér Hill	110.99	111.66	Roman Period road	47/118., 17	
II	18–22 Szépvölgyi Road	111.23	111.91	Appearance level of Szépvölgyi Ditch	47/10., 32/14.	125
III	Hajógyári Island	96.04–98.21	96.71–98.88	Roman Period poles at the Western bank of the cove, in the foreground of the Governor's palace	47/86., 36.	
III	Stripe between Bécsi Road and Lajos Street	96.33–97.33	97.00–98.00	Roman Period level. in the wells the gravelled aquifer		97
	Lower flood plain level	99.00–100.00	99.68–100.68	Lower flood plain level		47
III	Hajógyári Island	99.00–100.00	99.68–100.68	Lower flood plain level, Kis Island before ground levelling		44
		99.00–110.00	99.68–110.68	Terraced alluvial fan plain of Danube		15
III	Hajógyári Island	Over 100.00	Over 100.68	Hajógyári Kis Island before ground levelling. to higher flood plain level		44
III	Stripe between Bécsi Road and Lajos Street	100.33–101.33	101.00–102.00	Roman Period level		96
	Upper flood plain level	101.00–102.50	101.68–103.18	Terrace No I. (upper flood plain level)		47
III	Hajógyári Island	101.07–103.14	101.74–103.81	Roman Period floor levels. floors		47
	Military Town	102.00–103.00	102.68–103.68	Characteristic floor levels of Military Town		44
	Terrain free from floods	102.50–104.00	103.18–104.68	Terrace No II/a (surface free from floods)		31, 47.
	Aquincum – Civil Town	103.00–105.00	103.68–105.68	Floor level of Civil Town		47
	Elevated terrain /freshwater limestone with sand transported over it	104.00–106.00	104.68–106.68	Elevated terrain (freshwater limestone with sand transported over it)		32
III	Bécsi Road, hillside	104.83–105.33	105.50–106.60	N–S direction Roman Period aqueduct. running parallel to Bécsi Road	32/9–11	95
III	Bécsi Road, hillside	105.33–108.33	106.00–109.00	Roman Period surface. vacant. virgin regions in the Roman Period		96



Geomorphological–paleoenvironmental studies supporting archeological excavations and investigations are to be considered a new trend within the broader sphere of studies on environment and geomorphology. By publishing the latest achievements of researches of this kind carried out on the territory of Aquincum and in its wider surroundings this book may equally reckon on the interest of professional circles and inquiring audience.

Therefore the publication of such a volume of somewhat unusual character is welcome. The project could be completed as a result of the close cooperation of two important branches of studies, notably geography and archeology. They both have long lasting traditions in our country and on this occasion were represented by two prominent institutions, the Geographical Research Institute of the Hungarian Academy of Sciences, and the Aquincum Museum of the Budapest History Museum. Their contribution has made possible the publication of this book.

The studies were aimed to clear up the role of those natural factors which exerted a profound influence on the development of the settlement structure during the Roman Period. Romans had a special ability to realize advantages provided by geomorphological characteristics and they had made a good use of natural waters, flood-plain surface features and parent rocks for their creativity.

The volume is also deemed as a pioneering work with regard to the richly illustrated presentation of geological, geographical and other natural features exposed in several places in the course of archeological excavations. A short summary shows the most important objects of the Roman Period related to natural endowments and traces of activities of the time leading to environmental transformation.

Based on geomorphological evidence a new answer is proposed to a previously raised problem whether the Hajógyári Island existed as an islet already in the time of the Romans. Another intriguing issue tackled is the purpose of the system of trenches found in several places along the Danube River.

HAS
Research Centre
for Astronomy and
Earth Sciences
GEOGRAPHICAL
INSTITUTE