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Building the social

A query into the societal impact of the Pompeian water supply

Abstract

This study explores the importance of the means of ensuring water supply in the formation of the architectural profile and basic social organization of Pompeii. It sees the city's domestic water supply, for over two centuries ensured through rainwater-harvesting areas, basins and cisterns situated mainly in and below the many atria, as a stabilizing factor of both cityscape and household. Through the introduction of the city aqueduct in the 1st century AD and the creation of a generous network of public fountains this situation changes and the need to maintain the traditional organization of the "houseful", comprising enlarged family, slaves and dependents of various kind including shopkeepers, is lessened; the physical proximity between those of different status renegotiated. This development, witnessed in adaptations of the architecture, can be followed through close study of the standing structures in Insula V 1. The hallmarks are the creation of upperfloor living quarters seemingly independent from the life of the large households of the atrium houses, and in parallel the introduction of private water lines from the city aqueduct. The remodelling that resulted in the creation of the double-atrium house of Caecilius Iucundus is focal to the discussion since it offers a co-

eval chronological fix point in the AD 40s for both remodelling and obtention of piped water. Given that the change in the domestic architecture observed was merely in its embryonic state in AD 79, the tenability to attribute a lower dating than that traditionally attributed not just to the private lines, but to the city's distribution system of public aqueduct water as well, is reasoned. The particularities of Pompeii's geomorphological situation and political status and how they impacted the discussed change in social relationships are also raised.*

Keywords: actor-network-theory, Insula V 1, Pompeii, water supply

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Introduction

In 1999 discussions with the at-the-time superintendent of Pompeii, Prof. Pier Giovanni Guzzo, Insula V 1 was selected as the area to document and study by the Swedish Pompeii Project, for the purpose of *insula* study. The chosen approach was that of a mainly non-invasive study of the standing remains aiming to detail the building archaeological development of this city block during the approximately 300 years of history that the standing walls offer for study. Fieldwork was conducted regularly between 2000 and 2014, and over occasional shorter campaigns. Today the core of the project's archive comprises some 2,000 photographs, approximately half of which have been integrated into an open access research platform, www.pompeijiprojektet.se, comprising systematically structured image documentation, drawn scale plans and photographs, and descriptive texts. This archive allows the handling of *inter se* comparable empirical data over the whole area and offers a crucial platform for remote study, reflection and conclusions. The first overall assessment of the *insula* study appeared in print in 2010. The addition to the web archive of

* With the following I wish to express my gratitude for the support and guidance offered to us by the staff of the Pompeian heritage body, the Parco archeologico di Pompei. Special thanks are addressed to Prof. Pier Giovanni Guzzo and his successors, Dr Teresa Cinquantaquattro, Prof. Massimo Osanna and Gabriel Zuchtriegel, heads of the heritage during the long run of our project, and to Dr Antonio d'Ambrosio, Dr Antonio Varone and Dr Grete Stefani, directors of the site. I am also indebted to the Museo nazionale archeologico di Napoli (MANN) and its director, Dott. Paolo Giulierini for permission to take photographs of Insula V 1 as represented in the 19th-century cork model of Pompeii on display at the Museum. Finally, I want to express my warm gratitude to all colleagues and participants of the fieldwork, and especially to our photographer, Hans Thorwid. Special thanks also to Dr Thomas Staub, Dr Renée Forsell and Dr Carole Gillis for commenting on the text in its final rendering, and to Prof. Eva Rystedt and Dr Johannes Siapkis in earlier versions.

3D models which were furnished with a series of investigative tools¹ made possible a further publication of results in 2021.² Today, approaching the study of Insula V 1 with a theoretical bias and a social scenario in mind, the following presentation is based on, adds to and in some respect adjusts our earlier published results. Made by remote study, this revisit was possible thanks to the detail and manifold potential of the documentation and the prompt for discussion that it presents to the research team.

To embark on *insula* study involves investing in building archaeology, that is, in wall study over a large area in the hopes of grasping the past relationships governing it as much as the traditional tracing of the building history of each of its components. The idea was to revisit an entire *insula* in need of documentation, not, as traditionally in Pompeian studies, to focus on a specific house and its decorations or of even more restricted parts of the cityscape, but as a whole—both architecturally and for whatever information could be gained about its domestic life and businesses.³ Insula V 1, excavated mainly in the 1870s, was chosen for this revisit because of the diversity it represents in tandem with the eroded state of much of its original wall decorations, thereby propitious for a wall-study approach. In AD 79, this city block included 32 street-front entrances opening towards dwellings and working areas (Fig. 1). Three large houses of prestigious status (the House of the Bronze Bull, the House of Caecilius Iucundus and the House of the Greek Epigrams) covered most of the *insula* interior. Likewise of the *insula* interior were another four much smaller properties⁴—two of which had assumed defined commercial functions, one an inn (V 1,13) and the other a bakery (V 1,14–16). Bordering Via di Nola and Via del Vesuvio, the two busy streets enclosing the *insula* to the south and west respectively,⁵ there were 17 premises of modest size, ranging from a single-room street-front shop to one

with rear rooms. In the following, the designation *taberna/ae* may be used to denote them as their configuration, with large street-front openings, is similar and the function they had, whether workshops or shops, is often difficult to decide. When used together with the entrance number established in research, the Latin terms for the different premises will be used as proper names in the following when other kinds of conventional names lack.

Insula V 1 is a compact “ruinscape” of some 3,600 m², demanding much effort, time, and funding to be explored and acquainted with *in situ*.⁶ At the beginning of the project, in order to facilitate documentation the study area was divided into parts equalling each of the large houses and groups of lesser premises. The first result of *insula*-wide bearing and socio-historical implication was linked to the discovery of the well-preserved private water lines. When tracing their route from the street towards the *insula* interior, borders between premises were crossed, and this allowed a relation of dependency to be inferred between the small street-front shops, by which the lines passed without possibility of use, and their large neighbours, to whom the piped water was addressed.⁷ A second discovery concerned development over time;⁸ that the remains of Insula V 1 can be seen to reflect the main phases of Pompeian history. Among the earliest phases observed (apart from the unexpected find of Early Bronze Age strata,⁹ discovered at depth during the partial emptying of a well) were some sparse elements of early Samnite dwellings followed by a building boom and ordered urbanization in the late Samnite 2nd century BC. From the mid-1st century BC, earlier land largely unexploited for dwellings was transformed into built environment—no doubt gradually mirroring Pompeii’s changed status as Roman colony in 80 BC and with that, receiving a body of new citizens. Finally, in the Imperial period, mainly the Julio-Claudian 1st century AD, the large houses of this *insula* knew increased domestic opulence and expansion.

¹ Data acquisition was made by laser scanning with post-processing by the HUM Lab, Lund University, and by drone photogrammetry carried out by staff at the ISTI, CNR Pisa, who also created the investigative tools.

² Leander Touati 2010; Leander Touati *et al.* 2021.

³ *Pompejansk livsform* (Pompeian life form) was the original name of the project today known as the Swedish Pompeii Project, the designation it acquired in everyday use among the many projects of different nationalities working on-site at the time.

⁴ V 1,3; V 1,13; V 1,15; V 1,28.

⁵ For convenience this paper gives directions to cardinal points in a simplified manner, adjusted to the layout of Insula V 1. For instance, Via del Vesuvio is described as placed west of the city block (rather than to its south-west) and running north–south (rather than north-west–south-east). The corner where Via del Vesuvio meets Via di Nola is therefore described as the city block’s south-western corner, rather than its southern corner, etc.

⁶ We are indebted to many Swedish research foundations to which we present thanks below in end note on p. 210.

⁷ The water line addressed to the House of Caecilius Iucundus ran beneath the floor of Taberna V 1,22, similar to the manner in which the water line directed to the House of the Bronze Bull ran beneath Taberna V 1,29 and the House of Tofelanus Valens (V 1, 28). For map, see Leander Touati 2010, fig. 14, and below Fig. 23.

⁸ Leander Touati *et al.* 2021, 200–222.

⁹ This discovery of early Bronze Age remains (Palma Campania horizon beginning of 3rd millennium BC) was made by Prof. Mark Robinson, Oxford, at the time conducting a garden excavation in the House of the Greek Epigrams with a group of students from Oxford and Stockholm Universities. It was followed by a restricted deep excavation in the Vicolo delle Nozze d’Argento, close to the location of the well, and another in the garden area mentioned above. Nilsson & Robinson 2005; Boman & Nilsson 2008a; Nilsson 2008.

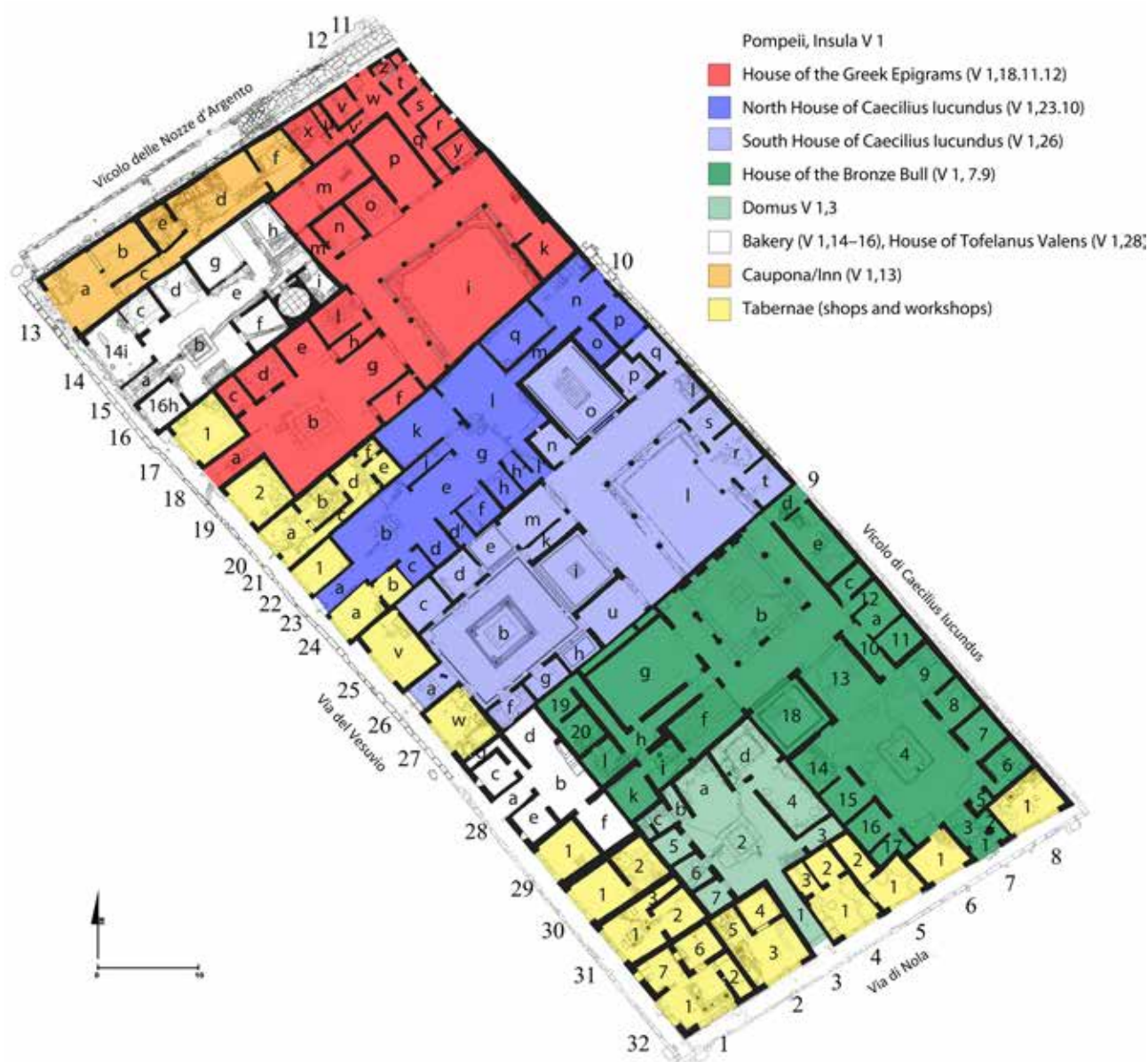


Fig. 1. Insula V 1. Properties and space use in AD 79. The houses are known by names (referring to special finds or to the ascertained or presumed Imperial-period owner: Caecilius Iucundus, Tofelanus Valens) and by entrance numbers attributed to them in research. Letter or number sequences from entrance towards rear designate ground-plan rooms. All main entrances open onto the two main thoroughfares, Via di Nola to the south and Via del Vesuvio to the west. Illustration: Ezequiel Pinto Guillaume & Henrik Boman.

Naturally, many arguments in the chains of conclusion based on wall study surfaced during fieldwork. Still, without the project's research platform on the web and systematic photographic coverage, few of the results mentioned above would have been possible.¹⁰ The 3D documentation, com-

bined with further investigation of the detail of the high-resolution photographic documentation, allowed both comparison between larger sets than the walls inside single rooms, and remote discussions in front of the computer screen. The present paper continues the exploration of data offered by

¹⁰ Defined as research infrastructure, the web platform as well as the photograph and 3D model archives are today in the care of Lund University, stored and continuously updated. Our gratitude to the

foundations which have supported our 3D work is presented in end note on p. 210.

this documentation, this time searching for change in *insula*-extending building patterns and interpreting their meaning.

Studying the long-lasting cityscape of Insula V 1, we found two innovative shifts or “material turns” witnessed in the architecture that could be taken as markers of changes in lifestyle.¹¹ The first was, of course, the great urbanization of the late Samnite period in the 2nd century BC, and the second when the new aqueduct system, designed to distribute pressured water all over Pompeii, was engineered in the Imperial period. The focus here, and aim of the present paper, is to highlight the later of these turns, describe its mark on the architecture in Insula V 1, investigate what the implications were for ancient social relationships, and discuss fine tuning of dating—an issue of inherent difficulty in Pompeian building archaeology.¹² Finally, the results made in the study of Insula V 1, seen as an urban area of sufficient size and social complexity with potential to describe a development of city-wide bearing, encourage revisiting the arguments on the impact, dating and special character of the city aqueduct.

In describing the social causality engendered by the aqueduct system that ensured a public water supply all over the city, this paper borrows its leading perspective and some terminology from Bruno Latour’s theory on the interwoven agency of human and material actors in the creation of the social. According to Latour, moments of technical innovation salient to societal change enhance the visibility of the mediating quality of the material actor. In the following, “mediating” and “intermediary” (when discussing material agency) will be used to describe the ways objects, alongside and in exchange with human actors, work in negotiation of social ways. Mediating material agency refers to objects causing sudden change in society; that of intermediary agency, to objects working

in human-driven negotiation of the social, in which objects tend to support traditional social ways, and only by series of “detours” interact with human initiatives in a slower path of development.¹³ The basic impetus to the following discussion resides in the idea to study the water systems of Pompeii as material actor.

Setting the scene

THE TRADITIONAL CITYSCAPE: ATRIUM HOUSES, RAINFALL HARVESTING AND HOUSEFULS

The Samnite wish for city life obtained through planned urbanization undoubtedly responded to exterior influence and concerted human agency. It is natural that the models of urban and prestigious living in the Greek world experienced by the Samnites who fought as Rome’s allies during the conquest of the Eastern Mediterranean, and wealth gained during the same enterprise, contributed to the subsequent, communally ordered building boom in Pompeii.

In Insula V 1, the southern part of the area was the prime choice for renewed development.¹⁴ Facing or close to Via di Nola—the higher of the city’s two main thoroughfares, situated on even ground transversal to the steep slope of the city hill—this was undoubtedly the most attractive part of the *insula* (Fig. 1). That the standing structures have revealed no remains of earlier constructions suggests that the area was cleared thoroughly with the intention of creating two grand houses (V 1,7 and V 1,26) of equal size, in spite of that one is irregular, trapezoidal in layout, the other formally rectangular. Obviously, the maximum extension of property V 1,26, dictated to the east by the perimeter, was modular to both. Although the first to be constructed,¹⁵ when as yet no border impeded further extension towards north, the southernmost of the two (V 1,7) covers approximately the same area as the

¹¹ For a review of the debate on innovation and society in the Roman world in more general terms, see Flohr 2015, 3–9.

¹² In Pompeian archaeology, building history based on wall study uses arguments involving updating of building materials (Carrington 1933; Adam 2007) in combination with the finer chronology resulting from a long tradition of study focusing on the wall decorations. Although the general scheme claiming succession of building materials and techniques is sound, the reality of material use was far less rigid. In Insula V 1, the choices in the kind of material and masonry technique used for the wall sheets that enclose the clay-and-rubble or concrete core of Pompeian walls, differ from one property to another, even in structures coevally built and collectively (or communally) planned (Leander Touati 2010, fig. 4; Leander Touati *et al.* 2021, figs 2, 14). Similarly, all kinds of resulting wall facings, from irregular (*opus incertum*) to ordered stone coating (*reticulatum*), just as the choices of brick (*testaceum*) or brick-and-block (*vittatum mixtum*) had long periods of use. *Incertum* was common in all periods, the other wall constituents or facings appear later, but *per se* none allows closer dating than to a rather wide time slot covering a period of some 150 years, from the Late Republican period to the end of city life in Pompeii.

¹³ Latour 2005, 74–82, esp. 79. For the terminology (mediator and intermediary), see Latour 2005, 39–40. The “detour” concept, relating to the tortuous interplay between material and human actors, is a major issue in Latour 2010.

¹⁴ For more detail in the following: Leander Touati *et al.* 2021, 200–205.

¹⁵ The ashlar masonry of the north-east boundary quoin (northern post of the ashlar-built frame of the rear entrance, the *posticum*) of the House of the Bronze Bull (Staub 2013, 176) forms a bonded return that links the north boundary to the *posticum*-structure, integrated part of the east boundary. The north boundary of the House of the Bronze Bull was subsequently reused as south boundary to Domus V 1,26. See Leander Touati *et al.* 2021, 184–185, fig. 2; Staub 2013, 25; Leander Touati 2010, 111; 2008, 121.

more strictly confined north neighbour. This equality in size indicates a reflected late Samnite “master plan”. That this plan also included a longitudinal *insula* mid-divide, running from south towards north, is suggested by that the alignment of the west boundary of property V 1,7, is followed up by the west division wall of the peristyle area of Domus V 1,26 (Fig. 1). Further north, a wall continuing the same alignment can be reconstructed due to an occurrence in the boundary separating the courtyard of Domus V 1,23 from the neighbouring peristyle of the house of the Greek Epigrams (V 1,18), which may be interpreted as the “footprint” of the former arrival of a wall, subsequently dismantled.¹⁶ This mid-divide aligns parallel to the still-standing east *insula* perimeter that probably served as point of departure for the land surveyor of the late Samnite period. The building technique chosen for it was innovative to the *insula*. Its neatly designed concrete masonry marks a well-aligned course reaching from the south-east *insula* corner to a point far up north where it meets with a presumably older perimeter, slightly diverging both in alignment and in masonry technique.¹⁷ The latter most plausibly marks a former property enclosed by the north-east *insula* corner, left untouched by the late Samnite developers. Several plots in the north part of the *insula* are hypothesized as areas remaining unexploited for building in this period.¹⁸

Houseful organization,¹⁹ i.e., cohabitation of different social strata within one and the same household alongside the prestigious living of the core family, characterized the way of living in the large houses of the late Samnite city. That they were independent civic units is demonstrated by the measures taken to secure their water supply. The preferred choice was obviously rainfall collecting and subsequent cistern storage, adopted in each house according to different systems,²⁰ most efficiently by covering the atrium with a partial or complete

compluviate roof construction for optimizing the water collection.²¹ The areas used for atria and gardens has promoted a perception of Pompeii from its rediscovery and on as model dwellings; admired as such by many modern architects,²² albeit without apprehending that the water-collecting purpose ideally demanded a mostly roofed atrium and the basic idea of house and household as a separate, independent unity within the city. The often-occurring doorways between street-front shops and atria indicate that both high- and low-status members of the houseful could expect to benefit from this self-contained system of water collection.

Wells were another option, although not so common. In Insula V 1 only two reasonably established cases and some more doubtful occurrences can be listed. Pompeii's natural situation, on a high hill-slope, was not particularly favourable for well-digging. Public and private wells were scarce, as the height above groundwater level was significant,²³ and possibly also because of poor groundwater quality.²⁴ Given our city block's up-hill location, reaching ground water level involved digging to a depth of some 35 m or more. The presence of

Bull, west wall belonging to demolished Republican-period room (Room g²—beneath banquet hall Room g), Staub 2013, 44, fig. 44.

²¹ For a discussion on the rain-catchment, *compluviate* roofing of atria: Campanaro 2022; Kavas 2012; Wallace-Hadrill 2007; Nappo 1997. Beneath the collecting-hole in the roof, the *impluvium*, a stone-built catchment basin securing the purity of the harvest, furthered the collected water to the cistern below.

²² As expressed by the Swedish architect Gunnar Asplund visiting Pompeii in 1914: “The house stole the applause. Indeed, it is definitely a fine feeling to pass through the outer door direct to this open courtyard with its pool, impluvium, in the centre, and from here to view the peristyle and its row of plaster columns. The whole arrangement is charming and agreeable, with all the rooms opening out on the two courtyards on the same level, or with only one or three steps difference. The small dimensions, both in plan and elevation, make the whole appear so ‘personal’ and comfortable middle-class ...” Ahlberg 1950, 26–27. Realized versions of such atrium houses may be seen, for example, in the private dwellings today known as *Romerhusene*, drawn by the famous Danish architect Jørn Utzon in the 1950s.

²³ The hill spur on which Pompeii is situated measures some 20–40 m above groundwater level. Good wells were scarce. Among the most well-known and oldest are the one close to the Doric Temple in the Forum Triangulare, the one at the bend of Via delle Terme/Via Consolare and furthest north, by the Vesuvian Gate, a well situated in the workshop facing the Castellum Aquae. Maiuri 1931. The wells linked to the Stabian and Republican Baths were hardly of interest for distribution to consumers, Adam & Varène 2008, 40. Two public wells found recently were located at the Via Stabiana/Via Meridiana crossroad (Coarelli & Pesando 2011, 50, fig. 9) and by the Stabian Gate (Ellis 2011, 68–69, fig. 8, n. 41). A series of wells of a more private nature have been mapped by Eschebach 1994.

²⁴ Desalles 2013, 217; Maiuri 1931, 556.

¹⁶ Leander Touati *et al.* 2021, 192, 207, fig. 8–10. The hypothesized wall would have been dismantled when two former properties fused to create one, Domus V 1,23.10.

¹⁷ Leander Touati *et al.* 2021, 195, figs 8, 14. The shift in technique, from *incertum* with superimposed masonry lines (reminiscent of the formwork lining used when casting the concrete core) to *incertum* void of such lines occurs at a point in the perimeter that corresponds to the hypothesized return of the older Samnite perimeter wall turned west to become boundary running through the midst of the area later to house the eponymous room (y) of the House of the Greek Epigrams (V 1,23).

¹⁸ Leander Touati *et al.* 2021, 203–205.

¹⁹ Wallace-Hadrill 1994, 92, 116–117.

²⁰ Water intake directly from the roof by means of a drainpipe integrated in the masonry of the wall is noted in the following premises: Caupona V 1,13, Room f, west wall; Taberna V 1,27 south-west corner; Taberna V 1,30 north-east corner of rear room, Room 2, Karivieri & Forsell 2008b, 107, for photographs, see M. Holmlund, ‘V 1,30 Taberna’, *www.pompejiprojektet.se*; House of the Bronze



Fig. 2. *Via di Nola* façade of entrances V 1,1–6, leading to dependencies from the House of the Bronze Bull. Photograph: Hans Thorwid.

wells despite this obvious difficulty underlines the order of importance of the water supply.

Accessibility by more than one household seems to have been the rule when digging wells in Insula V 1. The best example is situated in the northern-most extreme of the *insula* (Caupona V 1,13, Room f), immediately behind the perimeter and just beside a wide (2.3 m) doorway which granted direct access from the street.²⁵ The age of this well is difficult to ascertain, but the fact that the perimeter at its back consists of large limestone blocks and the same kind of blocks frame the later walled-off doorway suggests a pre-building-boom Samnite dating of both doorway and well. A second presumed well situated in the area later to become the peristyle garden of the

House of the Greek Epigrams (V 1,18.11.12, Room i)²⁶ may have held a similar communal importance. As judged from irregularities pertaining to the property boundaries erected in the late Samnite building phase,²⁷ it may be suspected that passageways, which of old had allowed access to this well, were respected and kept open at that time.

Similarly, the two street-front *tabernae* by entrances V 1,6 and V 1,8 opening onto *Via di Nola*, on each side of the main entrance of the House of the Bronze Bull (V 1,7), include structures that may be interpreted as well or cistern mouths of neighbourhood use and old age.²⁸ Both these water supplies, external to the residence, probably supplied the whole string of workshops along *Via di Nola* which, although dependencies to the residence as demonstrated by the shared, costly ashlar façade (Fig. 2), seem to have been planned without rear doorways admitting direct access to the cistern mouth in the atrium of the residence.²⁹

A NEW SCENE, AND A DATED EXAMPLE OF CHANGE —THE HOUSE OF CAECILIUS IUCUNDUS

The foremost indicator of changing social ways that we have observed in the study of Insula V 1 is the closing off in the Im-

²⁶ To differentiate a well mouth from a cistern mouth is difficult. The observation made in Herculaneum (Camardo *et al.* 2006, 197) that well mouths have somewhat larger diameters than cistern mouths has not yet been investigated in Insula V 1. Still, when as in the present case, there are no exterior pipes for water intake, and/or evidence of nearby walls which may have carried *compluviate*, rain-catchment roofing, the case for a well rather than a cistern is strengthened. The well opening in the garden of the House of the Greek Epigrams was cleared during the excavation in 2005–2006. The emptying of the shaft was halted at a depth of c. 1.5 m beneath the mouth. Staub Gierow 2008b, 95, figs 6–7; Leander Touati *et al.* 2021, fig. 22.

²⁷ Leander Touati *et al.* 2021, fig. 9.

²⁸ Note that at current knowledge, it cannot be ruled out that the openings could be cistern mouths, nor that they could hold underground connections to the cistern beneath the nearby *impluvium* of the House of the Bronze Bull. For the configuration of Pompeian cisterns, Sear 2004; 2006 and for more generalities, Klingborg 2017. Occurrences in the workshops behind openings V 1,2 (*fullonica*) and V 1,31 (*taberna*) will be discussed further on.

²⁹ The doorway between the atrium of the House of the Bronze Bull (V 1,7.9 Room 4) and Taberna V 1,6 is partially blocked on the *taberna* side by the base of a staircase of uncertain age. However, the doorway may have already been walled off during the 1st-century BC remake of the house at entrance V 1,7 to create a false door enhancing the symmetry of the layout of the atrium, corresponding to the false door created at the north-west side of the atrium, when a former doorway was walled off and the atrium *cubiculum* (V 1,7.9 Room 18) was transformed into to a dining room turned towards the peristyle. Staub 2013, 35.

²⁵ Leander Touati *et al.* 2021, 197, figs 15–16. The emptying of the shaft was halted at depth of about 4 m.

perial period of former communication between street-front working premises and residences beyond, and concomitantly the appearance of multi-room, upper-floor “apartments” above working areas; the latter often accessed directly from the street or from inside a shop, thus separated from the household life of the large houses. As this change coincides with the introduction of piped aqueduct water inside the three large houses, we see the new system of water supply to Pompeii as the factor that made this new way of living possible; people living in the new upper-floor apartments, or for that matter those working in the ground-floor premises no longer needed access to the house interior and its cisterns. From now on, they could instead satisfy their daily water provision needs at the public fountains situated at nearly all street crossings. The two wells in the northern part of the *insula* were abandoned (located at V 1,13, Room f and V 1,18, Room i)—as were some of the cisterns inside the houses.³⁰ When water was provided in abundance, it promoted business inside the city, at the same time ensuring that the working people of the street-front shops and workshops, even if still experiencing a dependent relationship to their wealthy neighbours, could live separated from them in their day-to-day household life. The following describes the new situation in detail to underline the correlation between the building archaeological features witnessing this change in household bonds and to the new aqueduct supply.

For the temporal setting of the change described above, Insula V 1 offers a case of close dating. The facts on which it is based deserve to be summarized before proceeding further. That the two graffiti celebrating Emperor Claudius,³¹ found

³⁰ Apparently, both wells of the northern part of Insula V 1 had lost their communal interest. The large doorway opening towards the north street, Vicolo delle Nozze d'Argento, was walled off and a kitchen bench was placed in front of it (date uncertain). The well of the House of the Greek Epigrams was closed at the latest when a fountain foundation intended for pressured water was constructed close by. Sherds of an Arretine plate dated c. 20–15 BC give a very broad *post quem* date. Staub Gierow 2008b, 95. Unfortunately these non-documented sherds can no longer be consulted for documenting the shape and for further discussion concerning the time span of its use. The sherds were lost subsequent to the last restoration works in 2015–2016, together with most small finds made in Insula V 1 and the project's working equipment, up to then stored in a locked room furnished for the purpose in the House of the Greek Epigrams. The cistern beneath the lavishly tessellated atrium floor of the South House of Caecilius Iucundus (V 1,26 Room b), belonging to the remake in the AD 40s, was probably abandoned as well.

³¹ *CIL* IV, 4089–4090. The second mentioned is misspelled and interrupted after seven letters. The complete name is given beneath. Given in the genitive case it uses a well-known formula for hale greeting, [*pro salute*] TI CLAUDI CAESARIS, found in official inscriptions and, more frequently as honorifics to Nero in Pompeian *dipinti* advertising games; the latter exemplified online by V.L. Campbell,

and published in the 19th century, date the building scheme that created the double-atrium house of Caecilius Iucundus (V 1,23.26.10) firmly in the AD 40s is a noteworthy discovery made during the assessment of the documentation collected by the Swedish Pompeii Project.³² The 3D model of the *insula* permitted a birds-eye approach to the architecture by which the particularities of the additions made to the old buildings during their remake became apparent. Additions made of brick-and-block or brick-faced concrete characterize the load-bearing or buttressing structures belonging to this building phase, occur in both parts of the house and in the new openings created between them.

The graffiti were applied to the plaster coating of a brick-and-block column,³³ one of a pair, set up in front of the east peristyle portico to enhance the effect of the exedra in the portico's middle section (V 1,26, Room r) by means of a roofed extension into the garden (Figs 1, 3). This addition to the architecture was one among several measures taken to enhance the lavish character of this garden, coevally also adorned with a series of fountain jets. The column in question is entirely, from base to top, in block-and-brick-faced concrete. That the graffiti are contemporary with, i.e., not later than the column on which they were applied, is ratified by the nearby *tablinum* (V 1,26, Room i) decorations; by style independently dated to the Claudian period, or more exactly stated, to the short period AD 40–45.³⁴ These paintings cover the main *tablinum*

Pompeii and Rome—Pompeian connections (<https://pompeii-networks.wordpress.com/>). Another use of the emperor's name in the genitive sense for naming his slaves, *servus ti claudi caesaris*, seems less appropriate in our case. Anyhow, both interpretations imply the creation of the graffiti close to the reign of the emperor. Karivieri & Forsell 2008a, 135–136, saw the graffiti as belonging to an intermediate building phase, involving the exedra only. Ehrhardt 2012, 138 n. 873 was first to suggest a link between these graffiti and the dating of the late Third Style decorations in the House of Caecilius Iucundus after being brought to attention anew by Karivieri & Forsell.

³² Leander Touati *et al.* 2021, 213–220.

³³ Leander Touati *et al.* 2021, figs 31, 34.

³⁴ Strocka 2007, 307. Cf. also: Scheffold 1957, 66; Bastet & de Vos 1979, 76–78 (phase IIb); Ehrhardt 1987, 94–106, 150–151; Ling 1991, 73. Numerous photographs in *PPM* vol. III, 1991 (A. de Vos, albeit suggesting the dating in the Augustan period favoured by some scholars: Dexter 1974, 114, 119–140; Richardson 2000, 5, 7, 55–57). A supplementary observation worthy of note is that the creation of Iucundus' double-atrium house occurred at a moment in time representing the junction of the Third and Fourth Styles. That the atrium and *tablinum* (Room i) behind entrance V 1,26 (South House of Caecilius Iucundus) were mainly decorated in the late Third Style, whereas the rooms further east—behind the east and north peristyle porticos, including the big banqueting hall V 1,26, Room o, gained from the space of the former neighbour (Domus V 1,23.10), and more rooms in this part of the house—were decorated according to



Fig. 3. The lavishly decorated tablinum (V 1,26, Room i) of Caecilius Lucundus focus on the garden aedicula (structure without modern roof in the rear, behind the two foreground columns belonging to the west garden portico). The graffiti-inscribed aedicula column, to the left in picture (partly hidden by a bush), its pair, the second column of the aedicula front, is in better view between the two foreground columns. Photograph: Hans Thorwid.

walls as well as the pillars that frame the room's new, widened garden opening, made in brick-and-concrete technique, as the graffiti-inscribed garden column characteristic of the load-bearing structures added during the remodelling (Fig. 4). The intricate miniature ornamental decorations (Fig. 5), integrated in the painted column, *velum* and architrave designs fram-

ing the figurative panels of the main walls of the *tablinum*, and echoed above the candelabra motifs of the pillars framing the garden opening (Figs 3–4), are typical of a small number of high-quality wall decorations of the late Third Style.³⁵

The works undertaken to create the double-atrium house included building in height with new or renewed upper floors added both over the house interior (in both parts of the house) and above the dependent street-front premises. Furthermore, four doorways between the residence and the street-front shops were walled off and turned into solid walls,³⁶ and a pri-

the principles of the early Fourth Style was already pointed out by Mau 1876, 163, 232–233, 245. Still, Ehrhardt 2012, 138, 171 was first to suggest that the time difference in the use of the late Third and the early Fourth Styles could well be minimal, in this house and in some more. He also brought attention to a consistency between the designs of the decorations of *tablinum* (i) and the large banqueting hall (o), despite their difference in style. Finally, the 3D approach to the ruin, revealed that the building technique in alternative use for bearing structures in both parts of the house were part of the same remodelling phase, i.e., the merge of the two former houses (V 1,23 and V 1,26) creating the double-atrium house. Hence, both styles belong in the same construction phase, which probably was of sufficient duration to bridge the change in taste. Leander Touati *et al.* 2021, 213–220.

³⁵ Bastet & de Vos 1979, 76–79. Ehrhardt 1987, 96, 101–105; Ling 1991, 59–60; Leach 2004, 179–180; Strocka 2007.

³⁶ Former doorway between atrium of Domus V 1,23 (later the North House of Caecilius Lucundus) and rear of Taberna V 1,20; between street-front *tabernae* openings V 1,22, V 1,24, V 1,25 and the atria of the houses behind entrances V 1,23 and V 1,26. Leander Touati 2010, fig. 36. Taberna V 1,27 is the only of the street-front workshops of the double-atrium house of Caecilius Lucundus that may have preserved a doorway to the atrium beyond. A cistern situated in front of the doorway indicates impeded passage, but not necessarily so in the late pe-

Fig. 4. South House of Caecilius Iucundus. View facing south-east from the tablinum (V 1,26, Room i) towards the peristyle garden. Note the brick-built frame of the tablinum opening and the homogeneity of the corner decorations. Photograph: Hans Thorwid.



vate aqueduct line was introduced—leading through one of the new passages pierced in the former boundary between the houses and beneath two brick-and-block structures typical of the remake.³⁷

All the large houses of Insula V 1 and their dependencies underwent renovations in the same vein, and of largely similar date, as those made when creating the double-atrium house for Caecilius Iucundus, who lived in this house, at least from the early 50s AD and on.³⁸ In the following, detailed descriptions of the building archaeological data from Insula V 1 will be put forth and analysed to provide a base for further generalization and conclusions on the aqueduct's impact on the city's architecture and social ways.

riod, since the latest floor covers the infilled cistern. Karivieri & Forsell 2008b, 106, fig. 11.

³⁷ Beneath the pier by the south-east quoin of V 1,23, Room k and the south-west quoin of V 1,26, Room n.

³⁸ Lucius Caecilius Iucundus is the today best-known personage in Pompeii, a banker and auctioneer whose business dealings can be followed with much detail from AD 52 to 60 through the inscribed tablets of wax and wood, found when excavating House V 1,26 in the 1870s. This archive, comprehensively published and studied by J. Andreau in 1974 and revisited by a vast number of scholars since, is a main source of our knowledge about social, economic and communal life in Pompeii of the day.

Innovation in Insula V 1

TWO EXEMPLARY CASES

Above the service area of the House of the Greek Epigrams

Imperial-period remodelling of the House of the Greek Epigrams comprised Fourth Style decorations in the atrium and peristyle garden, new garden porticos including extensive brick masonry, the introduction of an aqueduct line supplying a fountain in the centre of the garden, and, in the north-east *insula* corner, a new entrance (V 1,12) leading to the upper floor above the kitchen area of the house. The access to the upper floor was secured by a staircase leading upstairs directly from the north street, Vicolo delle Nozze d'Argento.

Room for the new entrance was obtained by an enlargement of the old rear entrance (*posticum*) of the House of the Greek Epigrams (Fig. 6). This new opening was divided into two separate doorways, one giving access to the staircase, while the other continued the use as *posticum* to the main house. The late date of the new entrance (V 1,12) is signalled by the material used for the post separating the two doorways. The frail structure built in brick-and-block-masonry contrasts with all surrounding masonry, of heavier and considerably more old-fashioned nature. This entrance divide stands on the threshold of the former *posticum*, onto which the east extremity of the threshold stone of the new doorway, also serving as first step of the staircase, reclines. Behind the doorpost, the stairwell was granted “privacy” by means of a screening wall



Fig. 5. Detail of the painted decoration in the tablinum of Caecilius Iucundus. North wall of the tablinum (V 1,26, Room i), detail of the decorations. Photograph: Hans Thorwid.

made of perishable material, *a cannuccia*.³⁹ Remains of this wall, plaster lumps with reed imprints, were found scattered behind the two entrances, alongside the narrow masonry base separating them.

As shown by windows in the façade on the east street, Vicolo di Cecilio Iocondo, this part of the house had upper-floor rooms of old date; the novelty resided in the entrance from the street, and the apparent independent status that this involved.⁴⁰ This independence was further ensured by the commodity of a latrine in the north-east extreme of the apartment. Via a down shaft, it shared a cesspit with the ground-floor latrine situated beneath (Room z).

It is no longer possible to establish the full extent of this apartment. The remains of the façade towards the east *vicolo* allow conclusions to be drawn regarding the space beyond the two upper floor windows, to which may be added the room where the staircase headed, above the west extreme of the ground-floor hallway (V 1,18.11.12, Room w). The inner separation delimiting the room behind the windows towards the south stands to sufficient height to thwart passage. The same goes for the continuation of the wall above the entrance hallway. Hidden from examination by modern mortar, only the section above the ground-floor corridor opening (the corridor

leading towards the peristyle, V 1,18.11.12 Room q) could result from restoration. However, the 19th-century cork model in the MANN (Museo Archaeologico Nazionale di Napoli), representing the ruins in, or much closer to their state “as was” when found than today,⁴¹ presents a separation wall above the opening of the corridor; thus providing evidence with good

³⁹ The model does not include the pillar separating the *posticum* of the House of the Greek Epigrams into two entrances, presumably because it was not yet restored to its ancient position when the model was made. This model, work first by Felice Padigione then by Vincenzo Bramante and his sons, was inaugurated in 1879. It documented what was at the time the complete excavated part of Pompeii. This short period of time suggests that older models, mostly using larger scales, could be used to speed the production. Insula V 1, mainly excavated 1875–1876, was among the parts latest added. A watercolour representing the peristyle of the South House of Caecilius Iucundus (V 1,26 Room l), made by the Swedish architect Isac Gustaf Clason in 1884, less than a decade after the excavations, demonstrates that restoration work had been undertaken in the meantime, and that modelling must have held close pace with the unearthing. The watercolour’s meticulous view includes a partly restored portico architrave, lacking in the model (*‘Pompeii Revived’*, www.pompeijoprojektet.se). In Insula V 1, only the Via di Nola street-front and some rooms beyond were unearthed in early excavations (18th and early 19th centuries) and may consequently have been documented in the model in restored state. On the model: Kockel 2004, 143–149; Malfitana *et al.* 2020, esp. 37–46; Poehler 2023 with a table presenting estimated average modelling lag between excavation and finished model. The average of Insula V 1, given as 9 years in the table, may be reduced.

³⁹ For the remains of the screen wall behind entrance V 1,12, M. Staub Gierow, ‘V 1,18 Casa degli Epigrammi greci—Room w’, www.pompeijoprojektet.se.

⁴⁰ For a categorization of more and less independent upper store apartments all over Pompeii and an attempted count of their importance in number, see Pirson 1999, 54–84, 161–164, 174.



Fig. 6. Two-partite rear entrance of the House of the Greek Epigrams. V 1,11 (left) served as posticum to the main house while V 1,12 (right) provided access to rooms on an upper floor. Photograph: Hans Thorwid.

reliability against passage here in AD 79; on that the upper-floor apartment was separated from the main house.⁴² Towards the west, none of the extant standing separation walls have sufficient height to suggest impediment for further extension in this direction of the new upper floor.

Above the rear rooms of Taberna V 1,20 linked to the North House of Caecilius Iucundus

An upper-floor apartment likewise entered from the street, this time Via del Vesuvio, was most likely part of the Claudian remake that saw the creation of Iucundus' double-atrium house. The doorpost pylon separating shop and staircase entrances is of the same typical make, in solid brick-faced concrete (*Fig. 7a*), as used for a series of load-bearing archi-

tectural members belonging to the new architecture in this house.⁴³ The location of the new doorway, next to the wide shop-opening of Taberna V 1,20, called for a stronger support than in the case of the double entrance (V 1,11.12) at the rear of the House of the Greek Epigrams, where further street-front openings lack. Although only the base of the post is preserved today, the 19th-century model in the MANN⁴⁴ shows it in full elevation with architrave and masonry above (*Fig. 7b*). The low roofing of the narrow entrance V 1,21, leading to the staircase up to the upper-floor apartment, clearly distinguishes it from that of the surrounding shop openings. The difference in height of the entrances signalled separation to the passer-by.

⁴² An earlier access from the north is possible. Beam holes evidence upper-floor rooms above the so-called Epigram Room (V 1,18.11.12, Room y), and Room r north of it. In that case access belongs in the days when the upper floor was reached by an internal staircase.

⁴³ For an overview of all these architectural members: Leander Touati *et al.* 2021, fig. 31. Photographs of the extant brick post: Leander Touati 2010, figs 33–34.

⁴⁴ The important section of the north-west façade of Insula V 1, which was largely destroyed by bombing in 1943, is documented by the cork model.



Fig. 7a. Entrances V 1,20–23 on Via del Vesuvio. Similar brick piers witness a coeval building phase: the creation of double-atrium house of Caecilius Iucundus. Photograph: Hans Thorwid.



Fig. 7b. Entrances V 1,20–26 on Via del Vesuvio in their 19th-century state documented by the cork model on display in Museo archaeologico nazionale di Napoli, Plastico di Pompeii. Note the low, slightly arched entrance to the staircase (V 1,21) separated from the shop opening (Taberna V 1,20) by a brick pier characteristic of the Claudian period remake. Photograph: Hans Thorwid.

Here, as in the previous case, it is not as much upper-floor rooms *per se*, but the fact that the staircase was accessed from the street that represents the novelty. A built staircase base situated *c.* 1.1 m behind the threshold marks the first step in an ascent which continued east along the ground-floor corridor up to a level *c.* 2.5 m above; the height is estimated from the row of beam holes preserved above the workshop's south-east rear room (Taberna V 1,20, Room e). Unfortunately, none of the other rooms have walls preserved to sufficient height to determine the size of this upper-floor apartment, but we may suspect a multi-room layout, since the staircase must have

reached the upper floor well before the more distant south-east room with extant beam holes.⁴⁵ Both walls and inner features were much damaged in 1943, but enough is preserved to localize a cesspit and a down shaft demonstrating that the upper apartment had a latrine connected to a similar installation on the ground-floor level, located at V 1,20, Room d.⁴⁶

On the ground floor, a doorway once allowed communication between the workshop's south-east rear room (Taberna V 1,20, Room e) and the adjacent atrium of Domus V 1,23 (Fig. 8). There is good probability that it was walled off in the same building project that saw the new access to the upper-floor apartment,⁴⁷ indicating that from that moment on, the activities of the atrium, now part of the life of Iucundus' enlarged, double-atrium house, had nothing to do with the goings-on in the rear rooms of the workshop. Yet, the material and make of the façade pylon separating shop and staircase indicate that it was related to building activity orchestrated by

⁴⁵ The distance from the front of the staircase base by the entrance to the west wall of the south-east rear room (Taberna V 1,20, Room e) displaying beam holes for an upper floor is *c.* 9.0 m, to be compared to the maximum of 3.5 m for the linear coverage of the staircase behind entrance V 1,12 (situated *c.* 4.0 m from the back wall of the room).

⁴⁶ Leander Touati 2010, fig. 35b.

⁴⁷ The north wall of the atrium of Domus V 1,23, subsequently subsidiary atrium of the double-atrium house, shares the characteristics of the wall separating, further east, the courtyard (V 1,23, Room l) from the peristyle area of the neighbour, the House of the Greek Epigrams. These walls presumably belong in the period of the early colony that saw the enlargement of Domus V 1,23, become Domus V 1,23.10, reaching all the way to the east perimeter. Leander Touati *et al.* 2021, 192–193, figs 10–11.



Fig. 8. Iucundus' subsidiary atrium (North House of Caecilius Iucundus V 1,23, Room b). North wall with walled-off doorway, former passage towards the rear rooms of Taberna V 1,20. Photograph: Hans Thorwid.

the grand neighbour. Both premises were likely of dependent status, and part of a same ownership, the same as the grand house to the south.

REMAKE OF THE SOUTH-WEST *INSULA* CORNER ORCHESTRATED FROM THE HOUSE OF THE BRONZE BULL

Dependency and building phase

Extensive late-period building activity, using various kinds of brick masonry, and in tune with the interest in promoting upper-floor apartments above workshops, characterizes the street-front premises that constituted the south-west corner of Insula V 1. The project included the extensive rebuilding of all workshops on Via di Nola from the west doorpost of Domus V 1,3 to the corner cook-shop, Thermopolium V 1,1,32, whose remodelled façade pylons were adapted in height and make to a new western street front comprising the series of Via del Vesuvio workshops (Fig. 9a–b) up to the House of Tofelanus Valens (V 1,28). At the beginning of our fieldwork, we entertained the hypothesis that this obviously reconstructed architecture with its sturdy street fronts built of brick-clad concrete was typical of a reconstruction necessary to remedy damage caused by the earthquake in the early AD 60s.⁴⁸ However, the analogy between the building techniques of the *insula*'s south-west corner and those used to secure load-bearing structures at the neighbour's, the double-atrium house

of Caecilius Iucundus, the creation of which is securely dated a generation earlier, prompted reconsideration. After returning to our documentation, it could be concluded that we are faced with a different option for explaining the remake of the south-west workshops.

Apart from the building techniques in use, the new scheme of the *insula*'s south-west corner obviously included all the parameters of social and economic change that we have noted as accompanying the changed relation between Caecilius Iucundus' main house and its street-front working premises. One more parameter, only suggested for interpretation by the remains of the upper-floor apartments described as exemplary cases above, can formally be confirmed in the case of the south-west *insula* corner: the workshops' status of dependency on the grand house. Roman law, stipulating the same ownership for ground and upper floors, furnishes the base of the argument.⁴⁹ The law text is quoted by several previous scholars when observing that the upper floors above *tabernae* V 1,30 and V 1,31 were permitted to intrude into the space above the atrium *cubicula* of Domus V 1,3,⁵⁰ subsidiary satellite of the House of the Bronze Bull.⁵¹ As we will see, close wall scrutiny

⁴⁸ Still hypothesized as such in Leander Touati 2010, 155, and often held as main dating hypothesis in several texts presented in 'Main Archive', www.pompejiprojektet.se.

⁴⁹ Kaser 1971, 375, 429–450; Meincke 1971; Rainer 1989; Saliou 1994; Pirson 1999, 68–70, refuting attempts in research to arguing a loosening of this principle in Early Imperial jurisprudence.

⁵⁰ Rainer 1989, 354; Saliou 1994, 46–47, fig. 13; Pirson 1999, 156–157, also noting the standardization of the workshop façades towards Via del Vesuvio and advocating one building initiative for the whole. Likewise, Robinson 2005, 94–95.

⁵¹ A secondary doorway opened in the rear wall of Room 15 (atrium *cubiculum* of the House of the Bronze Bull states this double-atrium status. The doorway opens on a corridor (V 1,3, Room 3) leading to the subsidiary atrium. The presence of scant remains of Third Style



Fig. 9a. *Via del Vesuvio* façades from north pylon of entrance V 1,32 (foreground) to the north-west corner of *Insula V 1*. Photograph: Hans Thorwid.



Fig. 9b. Façades of the south-west corner of *Insula V 1*, 19th-century state. Note the line of the partially restored architrave above openings V 1,29–31. Cork model, *Plastico di Pompeii*, MANN. Photograph: Hans Thorwid.

not only confirms these earlier observations understanding

wall decorations suggests an Augustan–Tiberian dating. Staub 2013, 35–36. A former window between Room 18 of the House of the Bronze Bull and Room d of Domus V 1,3, walled off when the room was decorated in the Second Style witnesses earlier dependency, although not necessarily of a nature indicating common every-day life in the way a double atrium organization would imply. On this window: Staub 2013, 34–35; Dickmann 1999, 149 with further literature on the changes made to Room 18; on the Second Style decorations: Beyen 1960, 74–81; Staub 2013, 68.

the overall ownership and building initiative originating in the House of the Bronze Bull, but also gives a temporal setting for the remake, and links it to the introduction of pressured water. The wall study, described in detail below, suggests that the great remake of the south-west *insula* corner mirrors a conscious purpose, surpassing in effort and impact any need simply to remedy damage suffered by an earthquake. Still, there is little doubt that one part of the remake—the most obviously apparent in the area, the substitution of the earlier tufa ashlar façade with one of brick-faced concrete, starting by the entrance to Domus V 1,3 (Fig. 10)—was achieved to remedy ground instability and that this instability was located inside the *taberna* behind entrance V 1,2, equipped as a *fullonica* in AD 79. That the instability may not have represented an immediate threat to the façade, but occurred further inside the workshop, can be assumed from the position of two relieving arches, no doubt meant to remedy the situation, set not in the front part of the workshop but in its rear. They are integrated parts of the rear boundaries to the west and north. The former bridges a previous cesspit reused for channelling the fullers' wastewater into the ground beneath (Fig. 11).⁵² It appears that

⁵² Investigation in the neighbouring *thermopolium* (H. Boman, 'V 1,1.32 Taberna—Room 6—Floor', www.pompejiprojektet.se) yielded no trace of the further westwards channelling of overflow water, as hypothesized by M. Flohr (2013a, 293). A similar abrupt termination of a wastewater channel occurs in the kitchen of the House of the Bronze Bull, Room l. Filtering waste into the porous subsoil was the normal procedure for latrines. On the latrine in *Fulonica V 1,2*, see Jansen 2002, 59–62.



Fig. 10. Entrance to Domus V 1,3. Photograph: Hans Thorwid.

a more serious situation was at hand close to the north boundary, shared with the atrium area of Domus V 1,3. Some investigation at depth has revealed that, on the atrium side of the boundary (V 1,3, Room 2, Fig. 12), both the stone fill that the relieving arch bridges and the brick buttressing on which the east springer reclines cover an earlier wall sheet, wrecked and cut to permit the laying of the last floor of the atrium.⁵³ On the opposite, *fullonica* side of the wall (V 1,2, Room 4), foundations beneath floor level are absent, except for the support of the springer (Fig. 13). The evidence suggests that the earlier version of the boundary may have sagged or threatened to sag into the *fullonica*. To explore the extent and cause of the ground instability (perhaps a collapsed cistern?) and how it came to affect the façade, more excavation is needed. In any case, the remake was necessary to allow the creation of a new workshop including a well-built, firm structure for the upper floor.

This remake manifests a new way of conceiving the *insula*'s south façade, no longer primarily expressing the extent of the estate, as did the former homogeneous ashlar construc-



Fig. 11. North-west corner of Fullonica V 1,2, Room 5. Relieving arch in the boundary wall shared with north-east rear room of Thermopolium V 1,1.32, Room 6. Photograph: Hans Thorwid.

tion.⁵⁴ Instead, the lowered position of the architrave of the *thermopolium* (V 1,1.32), demonstrated by the height of the load-bearing corner pylon (Fig. 9b), is shared by the full series of following street-front pylons along the Via del Vesuvio façade up to the House of Tofelanus Valens. As already pointed

⁵³ The face of the older wall are covered by a plaster revetment. A floor positioned some 0.3 m beneath the latest floor observed in the atrium is related to this wall revetment. The discovery that the atrium had two successive floors resulted in some erroneous deductions concerning the relation of the floors and the extant standing structures—ascribing Imperial period dating for the west atrium façade, presented in our earlier publication (Leander Touati *et al.* 2021, 210 and text to fig. 29).

⁵⁴ For the original façade stating the extent of the estate from street corner to street corner: Dickmann 1999, 80–81; Pirson 1999, 154–155; Staub 2013, 19, 85. Attempting a sum up of the arguments for a same estate: Leander Touati 2010, 138–142.



Fig. 12. Domus V 1,3. South wall of the atrium (Room 2) with relieving arch and extensive brick-and-concrete buttressing. Photograph: Hans Thorwid.



Fig. 13. North-east corner of Fullonica V 1,2, Room 4. Apart from the springer of the relieving arch, the boundary shared with the atrium of Domus V 1,3 (Room 2) lacks foundations. Figure highlight: Henrik Boman. Photograph: Hans Thorwid.

out by Felix Pirson,⁵⁵ a new kind of homogeneous effect was obtained by the common level accommodated for the architraves above the wide shop openings. The appearance of the south-west *insula* corner bears witness to conscious correlation and unitary plan.

⁵⁵ Pirson 1999, 156.

Albeit less conspicuous than the façades, there are more important structures indicating the single, unitary building effort. Most significant is the long wall, henceforth labelled the Long Boundary, parallel to the new brick façade, that runs from the east inner doorpost of the entrance corridor by the atrium of Domus V 1,3 (Fig. 12) to the street-front pylon shared by the corner cook-shop, Thermopolium V 1,1.32, and Taberna V 1,31 on Via del Vesuvio (Fig. 9a). Both ends of the wall, doorpost and stop abutting the street front pylon, are built similarly in massive brick-faced concrete. In between is a section of masonry with the relieving arch as its main feature (Fig. 12), with stone fill beneath, *incertum* masonry above, and the doorpost of brick-faced concrete serving as springer support. The second section starts where the east springer of the arch abuts its support—the inner separation between the two rear rooms of Taberna V 1,2 (Rooms 4 and 5, Figs 14–15), which forms a bonded return into the boundary.⁵⁶ From here

⁵⁶ Note that this inner separation wall is not aligned on the east wall of the atrium (Fig. 12) but is situated a step further east (Fig. 1), it represents another deviation from the building practice observed elsewhere in Insula V 1, by which only boundaries, conceived to en-

(including the inner separation) the masonry is homogeneous all way westwards, forming one long wall, characterized by a very neat design (only occurring this once in Insula V 1): *incertum*-masonry interspersed at set intervals with courses of large bonding tiles through the entire thickness of the wall (Figs 14, 16–17).

Between the Via di Nola façade and the Long Boundary, all interior separations display brick-faced masonry: some use brick exclusively, some brick-and-block and others *incertum* with bonding tiles (Figs 10, 14, 17). On the north side of the Long Boundary, there is but one wall using brick-including facing. This is the wall that separates the front room from the south rear room of Taberna V 1,31 (Rooms 1 and 2, respectively) (Fig. 18). That special importance was attributed the rear room (perhaps a retail shop) by its ancient users is witnessed by the painted decorations of “wallpaper” type, pleasing to the eye but unfortunately without dating value to the archaeologist (Fig. 16b).⁵⁷ Notwithstanding, the extant remains of the effort invested in decorating this room are sufficiently well-preserved to permit conclusions to be drawn regarding the contemporaneity of the latest structures in play: the decorations, the inner separation to the west, the floor, and the Long Boundary. The red of the upper, main zone of the decorations was matched by the similarly red *cocciopesto* floor. Still in a very good state of preservation, this floor abuts all walls of the room (Figs 16b, 18–19), including the Long Boundary and the brick-and-block-built inner separation between the front and rear rooms. Further, the extant decoration-carrying plaster dressed onto the Long Boundary includes a patch that overlies this floor, which indicates that the wall decorations were realized with the floor already in place, which further leads to the conclusion that we are investigating structures and decorations belonging to a same fitting of the room, to one coeval building scheme, and as such conceived in logical sequence: walls, floor, wall decoration.

Further, the floor of Taberna V 1,31, Room 2, in contrast to the somewhat lower floor of the front room of the workshop (Room 1), is made at the same level as the less well-preserved floor of the adjacent corridor (Room 3), with a latrine niche as end destination in the north-east corner of Taberna V 1,31 (Fig. 20). Set perpendicularly to the corridor, the arched niche of the latrine, neatly built in brick-and-block technique (Fig. 21a),⁵⁸ integrates the thick *incertum* wall separating this workshop from the neighbour to the north (Taberna V 1,30).

close property, form bonded returns at corners, while inner separations abut boundaries. Leander Touati *et al.* 2021, 190.

⁵⁷ PPM vol. III, 1991, 625–627 (A. de Vos); M. Holmlund, ‘V 1,31 Taberna—Room 2’, *www.pompejiprojektet.se*. Both including drawings of the design.

⁵⁸ For the floor levels: M. Holmlund, ‘Taberna V 1,31’ at *www.pompejiprojektet.se*.



Fig. 14. Interior separation between the rear rooms of Fullonica V 1,2 (Rooms 4 and 5). View westwards in Room 4. To the right is a section of the north boundary with the buttressed arrival of the west springer of the relieving arch. Photograph: Hans Thorwid.



Fig. 15. Upper part of the relieving arch housed in the boundary shared with the atrium of Domus V 1,3 (Room 2). To the left is the interior separation between the rear rooms of Fullonica V 1,2 (Rooms 4 and 5), functioning as support for the west springer of the relieving arch. Photograph: Hans Thorwid.



Fig. 16. Following the south face of the Long Boundary, back-bone of the south-west insula corner, from east to west. Photographs: Hans Thorwid.
Fig. 16a. South wall of cubiculum in Domus V 1,3 (Room 7). Fig. 16b. South wall of rear shop of Taberna V 1,31 (Room 2). Fig. 16c. South wall of front shop of Taberna V 1,31 (Room 1).



Fig. 17. Interior view of Thermopolium V 1,1.32 showing the Long Boundary, here functioning as north delimitation of Rooms 6 and 7. Note the characteristic incertum-masonry interspersed with courses of bonding tiles and the brick-faced concrete of the east end of the Long Boundary. In front further brick-masonry techniques used for inner separations and for the corner pylon of the façade (left in picture). Photograph: Hans Thorwid.



Fig. 18. Brick-and-block-built separation between front and rear rooms of Taberna V 1,31, Rooms 1 and 2. The modern shelter roof protects decorations which may indicate some public function, perhaps a retail shop. Photograph: Hans Thorwid.



Fig. 19. Plan view of the cocciopesto floor of the main rear room of Taberna V 1,31, Room 2. The floor abuts the walls on all sides and is covered by extant wall plaster in the south-east corner. Note the drain channelled beneath; after making a turn for depositing unwanted elements, it enters the shaft of the cistern. Photograph: Hans Thorwid.



Fig. 20. Cocciopesto floor of Taberna V 1,31, Room 3, a corridor ending in a tiled floor in front of the latrine niche housed in the north wall. Note how the wall plaster covers both incertum and brick-and-block masonry and overlies the floor. Photograph: Hans Thorwid.

Another niche, twin in kind and make to the one just described, belongs to the upper floor level above the south-east rear corner of Taberna V 1,30 on the other side of the same wall (*Fig. 21b*). The two latrines share downpipe and cesspit, both situated in the rear room of Taberna V 1,30 (Room 2). Pirson's suggestion that the similar building technique used for both niches leads to the conclusion of a common ownership and enterprise⁵⁹ may here be confirmed, with state of evidence carried further. To sum up, the extant floors and parts of plaster revetments in

Taberna V 1,31 provide structural links to the Long Boundary and the remake of the entire south-west corner: one patch of wall plaster on the north wall of the corridor (V 1,31, Room 3) leading to the ground-floor latrine covers both the *incertum* of the wall and the rim of the niche's brick-built frame (*Figs 20, 21a*). The same patch overlies the edge of the floor of the corridor (*Fig. 20*). In turn, this floor passes southwards through the doorway to V 1,31, Room 2. It continues into and is at the same level as the well-preserved floor of this nicely decorated room. Finally, the last-mentioned floor (of V 1,31, Room 2) constitutes base and support to the under-plaster of the fine decoration that in part still clings to the north face of the Long Bound-

⁵⁹ Pirson 1999, 157.



Fig. 21. Latrine niches housed in the shared boundary between Tabernae V 1,30 and 31. Photographs: Hans Thorwid. Fig. 21a. Ground-floor niche in Taberna V 1,31, Room 3. Fig. 21b. Upper-floor niche in Taberna V 1,30, above Room 2.

ary (Figs 16b, 19), the backbone of the remake of the south-west *insula* corner. Obviously, all these structures belong to one, unitary building phase.

Upper-floor apartments

All workshops on both sides of the *insula*'s south-west street corner preserve enough elevation to indicate upper-floor structures. Most remarkable are the already mentioned remains of two doorways that cut through the boundary separating the *tabernae* behind entrances V 1,30 and V 1,31 from Domus V 1,3, since they demonstrate that dwellings of plural-room nature above workshops were allowed to extend into the space of neighbouring properties.⁶⁰ The openings, framed in brick-and-block

technique,⁶¹ gave access to space above ground-floor *cubicula* in Domus V 1,3, Rooms 5 and 6 (Fig. 22). It would take close wall study to suggest whether they were punched through older masonry or part of a totally new superstructure above the ground-floor elevation of the old boundary. Anyhow, in masonry style they relate to that of the nearby latrine niches in Taberna V 1,31, Room 3 and Taberna V 1,30, above Room 2.

As such, upper floors are by no means exceptional in Pompeii, where probably most street-front premises were thus equipped—high street-front façades had been desired since older times, not least because they contributed to inward roof

⁶⁰ For some more examples elsewhere in Pompeii of upper-floor apartments incorporating space above *cubicula* of adjacent atria:

Casa dei Postumii (Pirson 1999, 158); Casa del Menandro (Ling 1997, 58, 145; Flohr 2013a, 291).

⁶¹ The brick-and-block frame of the upper-floor doorway of Taberna V 1,30 is missing today but is clearly documented by the 19th-century cork model (Fig. 22b).

Fig. 22a. Upper-floor doorways in the boundary between ground-floor *Tabernae* V 1,30, 31 and *Domus* V 1,3, Rooms 5 and 6. View from west, Via del Vesuvio street front. Photograph: Hans Thorwid.



Fig. 22b. Upper-floor doorways in boundary between ground-floor *Tabernae* V 1,30 and 31 and *Domus* V 1,3 (from right to left) Rooms 5 and 6. View from north-east in 19th-century state of ruin. Cork model, Plastico di Pompeii, MANN. Photograph: Hans Thorwid.



falls and thereby to rain-catchment devices. More noteworthy here is the size and the obvious importance ascribed them by the planner. Unfortunately, no staircases are preserved, but the upper floors were most probably accessed from inside the workshops.⁶² Occurrences of one large limestone block,

⁶² The opinion that the absence of space for opening in the ceiling, judged from the position of beam holes, excluded passage to the upper floor (M. Holmlund, 'V 1,31 Taberna', www.pompejiprojektet.se) is not valid. Since the beam holes perforate the boundary between the two *tabernae* behind entrances V 1,30 and V 1,31, it cannot be decided which hole served which ceiling. Further, a cantilevered balcony along the façade may be hypothesized.

invariably positioned close to a wall and probably indicating the position of a first step, are found in *Taberna* V 1,29,⁶³ the north-west room of *Thermopolium* V 1,1.32 (Room 7) (Fig. 17) and the front rooms of the *tabernae* behind entrances V 1,30 and V 1,31 (Fig. 22a). The blocked-off former access from *Domus* V 1,3 to the upper floor above the atrium *cubicula*, of special importance to the present inquiry since furnishing one more example of the closing off of working premises from residences, will be discussed later.

⁶³ M. Holmlund, 'V 1,29 Taberna', www.pompejiprojektet.se.

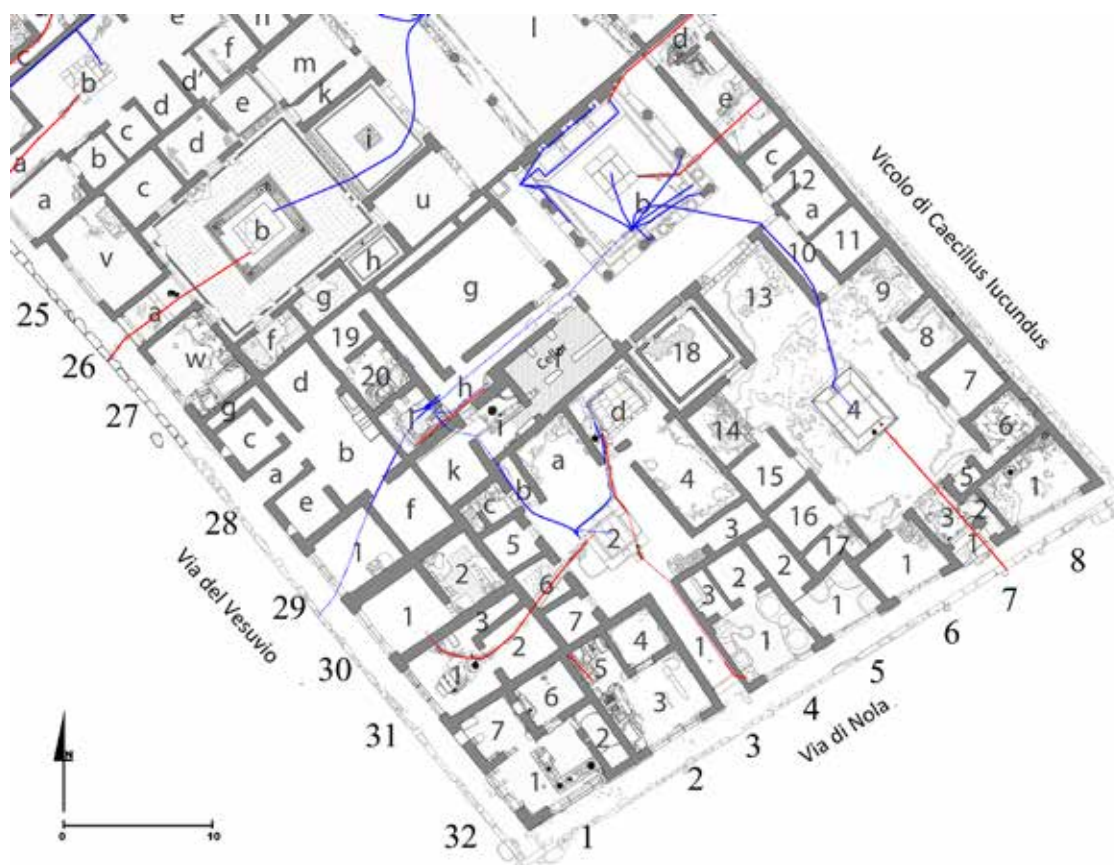


Fig. 23. Water-distribution network within the House of the Bronze Bull and its estate. Blue: incoming lines of pressured water (lead pipes). Red: overflow (masonry-built drains) channelled towards cisterns in the workshops, towards the street only in the case of water passing the impluvium of the main atrium). Dotted lines: routes, mainly of lead pipes, for which the run is assured but has not been followed in detail since evasive excavation has been avoided, or sections where the pipes were robbed in previous clearing of the area. Drawing: Henrik Boman.

Piped water, walling off, and discussion on dating

The private line of pressured water entering Domus V 1,3 from the House of the Bronze Bull once again clearly indicates from where the initiative stemmed for the—by now described in detail—building phase of the south-west *insula* corner. Added to overflow from the traditional water-harvesting spaces, the wastewater of the fountains in Domus V 1,3, supplied in pressured water from the House of the Bronze Bull, was forwarded by way of drains to several of the surrounding workshops (Fig. 23).

The pressured water brought to Domus V 1,3 from the city aqueduct (Water Tower no. 2 as judged from the direction of the line) entered from Via del Vesuvio by Taberna V 1,29, passed through the House of Tofelanus Valens (V 1,28) into the kitchen of the House of the Bronze Bull (V 1,7.9, Room I),⁶⁴ situated

at the furthest end of a large expansion,⁶⁵ henceforth designated as the West Wing, made to the peristyle area of the House of the Bronze Bull. Two interconnected distribution boxes located in the kitchen (V 1,7.9, Room I) provided an impressive system of plumbing which permitted multiple branches (Fig. 24). The main branch continued eastwards to the large nymphaeum and the fountain garden, finally to feed the jets of the marble *impluvium* of the main atrium, while other branches furnished the bath (V 1,7.9, Rooms 19–20), located on the other side of one

either stem from a not yet discovered distribution box, where the incoming line forked (beneath the extant *cocciopesto* floor of the kitchen or beneath the west kitchen bench) or from a different incoming line, perhaps fed from the main of the aqueduct higher up on Via del Vesuvio (Water Tower no. 1?).

⁶⁵ Made on space formerly belonging to the neighbours: House of Tofelanus Valens (V 1,28): Staub 2013, 46 n. 245; Pirson 1999, 156, and also to Domus V 1,3 as suggested further on in this paper.

⁶⁴ There are two inlet lines, one per box. The route from the street can only be traced for the southernmost. The northernmost must

of the kitchen walls, the service area (V 1,7.9 Rooms h and i), and the nearby Domus V 1,3.

With this new supply, Domus V 1,3 was firmly established as the hub of a water-distribution system supplying the neighbouring workshops. By a system of drains (Figs 23–25), the traditional rainfall overflow, collected in two water-catchment areas inside Domus V 1,3, was boosted with piped water and channelled towards cisterns in Taberna V 1,4 to the south, and to the *tabernae* by entrances V 1,30 and V 1,31 on Via del Vesuvio. The importance of the small house to the activities conducted in the surrounding workshops probably involved more than those directly connected by drains. At least three workshops were dedicated to work that had a particularly high demand for water, two dyeing shops (*Tinctoriae* V 1,4 and V 1,5—no. 4 connected) and one fuller (*Fullonica* V 1,2). The nonconnected status of the fuller comes as a surprise to the interpreter, but could be explained by the lack of water storage devices resulting from a hypothesized cistern collapse: possible cause for the ground instability in *Fullonica* V 1,2 discussed above.⁶⁶ A presumed-private pillar fountain situated on the curbstone in front of the boundary separating Taberna V 1,4 and the entrance of Domus V 1,3 (Fig. 10) represented another potential water resource for the *insula*'s southern workshops.⁶⁷ It may have been fed from a pipe branching off the distribution box close to the north-west corner of the *impluvium* of Domus V 1,3 (Fig. 25). Since the pipe is broken just after the box, current-state knowledge cannot determine the destination, only that it was equipped with a tap and directed southwards.

Contemporaneity of drain system and pipes is suggested by the closely related routes of the two infrastructures. The incoming aqueduct line entered Domus V 1,3 by the corridor (Room b) alongside the *tablinum* (Room a) and continued to a distribution box by the *impluvium*, where it forked into three lines (Fig. 26), two of which were equipped with taps. One line dived into the ground at a 90° angle, obviously meant to feed the water jet that surfaced through a hole in the middle bottom slab of the *impluvium*, whereas the other continued southwards. The third turned eastwards and continued to a rainwater-catchment area (Room d) situated north-east of the atrium. This, the presumably oldest water-collecting arrangement in the house, is situated at the foot of three high walls (Figs 27–28), two of which are boundaries shared with the grand neighbour,



Fig. 24. Kitchen of the House of the Bronze Bull (V 1,7.9, Room l). East side of the room containing a niche for the pair of water-distribution boxes and a staircase leading to the same level as the main part of the West Wing and the peristyle area of the house. Photograph: Hans Thorwid.

the House of the Bronze Bull.⁶⁸ Beam holes in the walls above the benches witness of measures taken to protect and collect by means of (probably *compluviate*) shelter roofs on the north and east sides and a more regular partial roofing to the west. The catchment area proper is a shallow basin framed on the south side by a mere rim of cut lava blocks, the upper surface of which correspond to the floor level of Room 4 (opening in full width

⁶⁶ The two cistern mouths in Taberna V 1,31 constitute a parallel case, albeit here the implementation of a new cistern was possible. The older structure, a cistern or well, was solidly covered with large stone slabs (Fig. 31).

⁶⁷ T. Staub, 'Façade—Via di Nola', www.pompejiprojektet.se. Flohr 2013a, 81, 152–153, fig. 53—however erroneously claiming that the fountain is placed in front of/next to the entrance of *Fullonica* V 1,2.

⁶⁸ The old lava stone cistern mouth and the walled-off window situated in the east boundary, shared with the atrium area of the House of the Bronze Bull, are worth noting. Together they indicate that the unroofed situation and water-harvesting function of this area date back to an early period. The window (rounded feature, preserved only in its lower part, situated on top of the boundary presented in Fig. 28) once functioning as a subsidiary light inlet to the north-west *cubiculum* (V 1,7.9, Room 18) of the House of the Bronze Bull was most likely walled off when this room was transformed into a garden *triclinium*. The new full front opening towards the peristyle (Room b) made the window obsolete. The entire room was covered by wall decorations in the Second Style. Staub 2013, 43.



Fig. 25. Water arrangements in the atrium of Domus V 1,3. The lead pipe for pressured water enters the atrium from north-west. The line forks in a distribution box at the impluvium quoin. One line follows the north rim of the impluvium and continues alongside the covered overflow drain to dive beneath the threshold of the rain-catchment area of Room d. Two more lines exit the distribution box. One is broken and robbed, the other dives to feed a spout (robbed) in the middle of the impluvium. The drain originating in Room d continues south, along and beneath the impluvium rim. South of the impluvium, the drain continues towards the entrance corridor, fauces. Another drain originates in a hole pierced through the west border of the impluvium and continues towards west. Its cover is only partially intact. Photograph: Hans Thorwid.



Fig. 26. *Domus V 1,3 Room 2 (atrium)*. Pipes and distribution box by the north-west quoin of the impluvium. Note the two taps, and the lead cap strengthening the 90° dive of the middle pipe. Photograph: Hans Thorwid.

to the basin area). On the three other sides the basin is framed by masonry built benches, probably devised to protect the base of the surrounding walls from water intrusion. Obviously, particular attention was given this protection at the north side. Here the bench runs in uniform height all the way along the wall, whereas on the west and east sides it sloped downwards to join the level of the rim of the basin's south side. Most likely, the importance of the north bench finds its explanation in the location, on the other side of the wall, of the cellar (beneath Room f) of the grand house.⁶⁹ Situated at a much lower level than the basin floor, it must have been at risk of flood. Once again, we may note an arrangement that demonstrates the origin of the initiative at the grand neighbour.

The sloping plane of the west bench served as bed for the aqueduct pipe and was subsequently built up to the same level as the north bench. The pipe continued on top of the north bench to finish, as shown by an imprint in the masonry, in a spout that would have directed a water jet into the basin.⁷⁰

When ascending the west bench, the pipe had already travelled for some distance side by side with the drain (Figs 25, 29). This proximity of in- and outgoing water suggests mediated planning of pipe and drain. Modifications made to the *impluvium* of the atrium reveal more about the new interest

taken in the draught of pipes and drains (Fig. 25). On its way south (ultimately to the cistern of Tinctoria V 1,4, Room 1), the drain passes not alongside but beneath the slabs forming the east rim of the *impluvium*.⁷¹ Obviously, the entire *impluvium* had to be lifted, when pressured water was introduced, to achieve the perforation in the bottom that was to accommodate the fountain spout, but there may also have been previous rearrangements of the atrium and its water utilities. The *impluvium* is old in type but probably not originally designed for this location as indicated by the mismatch of its east and south rims contributing to the forshortened appearance of the east side (Fig. 25).⁷²

⁷¹ This drain most probably predated the *impluvium*. From Room d it was directed towards the north-east quoin of the basin where there is no hole to permit an inlet. The kink in the route by the *impluvium* quoin probably indicates secondary adaptation, coeval with remodelling, or creation of the *impluvium*. The kink permits the drain to pass beneath the east *impluvium* rim and, after turning at the corner, continue beneath the south rim where it divides in two lines; one leading to the cistern shaft with opening integrated in the south rim, the other directed southwards through atrium and *fauces* to feed the cistern in Room 1 of Tinctoria V 1,4. This final destination, evidenced by an inlet in the shaft of the dyers' cistern, was discovered by P. Borgard while examining dyer shop fittings. Borgard 2002; Borgard *et al.* 2005. Informed by Borgard, the upper part of the shaft was emptied by the Swedish Pompeii Project, the inlet photographed, see, 'Tinctoria V 1.4—Cistern', www.pompeijoprojektet.se.

⁷² Only two of the stone slabs forming the basin rim share identically faceted profiles. The rims of the east side are wider and more crudely carved. For description and further images, see, R. Forsell, 'V 1,3

⁶⁹ It is worthy of note that, on the other side of the boundary, the today missing floor of Room f, above the cellar, was in level with the upper surface of the north bench of Room d. One more argument on coeval planning.

⁷⁰ R. Forsell, 'V 1,3 House—Room d', www.pompeijoprojektet.se. Nicely situated, with a view from Room 4.



Fig. 27. The rainfall-collecting area situated north-east of the atrium in Domus V 1,3, Room d, view from Room 4, triclinium of Domus V 1,3. Note the three beam holes to the left in the rear wall demonstrating the former presence of a roof, and east of this, a lower row of lesser beam holes suiting a shelter roof. Photograph: Hans Thorwid.



Fig. 28. East side of the water-collecting area in Domus V 1,3, Room d. The beam holes in the boundary shared with the House of the Bronze Bull are situated at the same height as those in the north wall (Fig. 27). Note the sloping bench beneath alongside the east wall. Photograph: Hans Thorwid.

A hole pierced in the west border of the *impluvium*, allowed water into a drain that furthered it to Taberna V 1,31. The drain passed beneath the atrium and mid-cubiculum floors of Domus V 1,3 (Figs 23, 25, 30). On the other side of the boundary the new, neatly conserved floor of the rear shop of Taberna V 1,31, Room 2, already much discussed above because it provides valuable relative dating criteria, is positioned directly on top of the drain (Fig. 19). It underlines the interplay between the new drain system and the building phase of the south-west *insula* corner. Further on, the drain forked, one branch leading towards the cistern mouth situated in the front room of Taberna V 1,31, the other continued towards a cistern inside Taberna V 1,30 (Fig. 31). Obviously, the single initiative and unitary building phase behind the remake of the south-west *insula* corner also included boosted water supply, ultimately stemming from the city aqueduct.

A building sequence observed in the corridor (V 1,3, Room b) linking the service area of the West Wing of the House of the Bronze Bull with the subsidiary atrium of Domus V 1,3 provides new and valuable information on how the introduc-

tion of pressured water occurred in tandem with the blocking of communications between areas directed towards household life and business, respectively. The creation of the West Wing had once included opening this corridor to the subsidiary atrium (Domus V 1,3 Room 2), otherwise reached only from the atrium of the main house by way of the doorway opened in the rear wall of its Cubiculum 15.⁷³ The layout of the new, north-bound service corridor (V 1,3, Room b) was facilitated by an extant, former passage alongside the *tablinum* of Domus V 1,3, Room a.⁷⁴ That the new function of the corridor belongs in the same building phase as the large expansion west of the House of the Bronze Bull is clearly demonstrated by the fact that the same

⁷³ This doorway is walled off today but is represented as open on the cork model.

⁷⁴ The old age of the corridor is suggested by its orientation. Together with the continuation north of its west wall, now become east wall of the westernmost room of the West Wing service area, V 1,7.9, Room k, it shares axis with the entrance *fauces* of Domus V 1,3, Room 1 (set perpendicular to Via di Nola) but to no other walls in Domus V 1,3 nor in the rest of the south-west *insula* corner—whose wall alignments tend to adapt orientation to the north-south-aligned streets instead, just as do those of the House of the Bronze Bull.

House-Room 2 (atrium)–Impluvium’, www.pompejiprojektet.se. For a further representation, see below, Fig. 44.



Fig. 29 (above, left). Lava stone threshold and cistern mouth of the rainfall-catchment area in Domus V 1,3, Room d. Note the lead pipe for incoming pressured water running next to the stone-covered masonry built outlet drain, and ascending the west bench. Photograph: Hans Thorwid.

Fig. 30 (above, right). Domus V 1,3 Room 6. The cocciopesto floor is broken to allow the introduction of the drain directed to Taberna V 1,31. The strengthened door-frame opening on the atrium stands directly on the floor. Photograph: Hans Thorwid.

Fig. 31 (right). Drains and cistern mouths in the front room of Taberna V 1,31, Room 1. Photograph: Hans Thorwid.



characteristic masonry technique was used to frame all door openings of the West Wing including this one, the new service corridor communicating with the subsidiary atrium (V 1,3, Room 2). All are built of regularly cut small stone blocks, often called *tufelli* in research, albeit not always in tufa (Figs 24, 32–33). Next step was to make a breach in the mortar floor of the corridor to house the pipe (Fig. 34). Finally, the opening on the West Wing-side of the corridor was walled off.

Close relation in time between the positioning of the pipe and the walling off may be concluded from the situation of the floors in and connected with the blocked service corridor. On the West Wing side, in front of the blocking masonry, the aqueduct pipe has not been detected. The blocking stands on top of the floor (Figs 32–33). In contrast, inside the corridor the blocking stands only partly on the floor (Fig. 34). Where a breach was made in the floor to accommodate the pipe, the blocking stands instead on top of a fill of earth and stones (Fig. 35). Apparently, the floor was mended on the north side, which is logical since here it served as a landing before the further descent eastwards to the cellar (Fig. 23). Inside the corridor, an earth fill was apparently deemed sufficient to protect the pipe since the corridor had become a dead end.

Before proceeding to a discussion on dating, one more example relating to walling off and the introduction of private aqueduct water in the area merits note. One more walled-off doorway belongs to the upper floor level of Domus V 1,3, to the wall separating Room 5 and the small Room c, the inner part of which once accommodated a stairwell.⁷⁵ On the upper floor level, a *cocciopesto* line of in the wall indicates the place of a former doorway (Fig. 36). The idea that naturally emerges is that this blocked-in access to the upper-floor space above the *cubiculum* was replaced in function by the new access from the apartment above Taberna V 1,30.

At this point, it is time to return to the discussion on the date of the remodelling of the south-west *insula* corner, which, as we have seen, involved a building effort by far larger and more comprehensive than needed simply to remedy suffered damage. Related both to the boosted water provision of the remodelled workshops surrounding Domus V 1,3, and the walled off corridor, link to the West Wing of the House of the Bronze Bull, the line of pressured water addressed to Domus V 1,3 is of key-significance. If it belonged to the same, original water system as the main lines of the grand house, a date as late as that of the earthquake of AD 62/63 must be rejected, as it is hardly feasible that the House of the Bronze Bull, through time the grandest among the residences of Insula V 1, and where the use of pressured water was given such prominence, would have obtained its aqueduct

line as late as in the 60s AD, that is, some 20 years or a generation later than the neighbour, the House of Caecilius Iucundus. The lavish redecoration that accompanied the introduction of the water line into the House of the Bronze Bull encompassed transforming the peristyle (V 1,7.9, Room b) into an impressive fountain garden dominated at the north end by a huge nymphaeum, and opening on to it, a new dining hall (V 1,7.9, Room g), the largest ever in Insula V 1. As we will see, the question of dating has bearing also on our understanding of the building phases of the main house.

The claim of one unitary scheme for all parts of the water supply network to the estate of the House of the Bronze Bull, including that forwarded to Domus V 1,3, is supported by the very intricacy and homogeneity of the technical particularities relating to the plumbing, described in great detail in Thomas Staub's monograph on the House of the Bronze Bull.⁷⁶ To this argument that of the difficulties afforded by the natural terrain for the draught of pipes may be added. As recently shown in geomorphological investigation, the area is the site of an extinct volcanic crater,⁷⁷ which may explain the abrupt changes of levels operating towards the west and south edges of the West Wing. The north part of the House of the Bronze Bull including the peristyle area and the West Wing up to the bath suite (Rooms 19 and 20) are situated about a metre above the floors of the kitchen (Room l) and Domus V 1,3 (Figs 24, 32).⁷⁸ This situation and the plumbing response to it support the assumption that there was a single original plan for the draught of all main pipes within the House of the Bronze Bull. Branches directed southwards must have been particularly difficult to construct, as suggested by the two pipes performing peculiar 90° dives when exiting the main distribution boxes in the kitchen, one to a box (Room l).⁷⁹ The dive was probably needed to allow passage beneath deep wall foundations, presumably corresponding to and buttressing the structures built above the fall of the terrain towards the south.⁸⁰ The diving

⁷⁶ Expressing his opinion on a single operation as the origin of all water arrangements forming the very complex water-distribution system in the House of the Bronze Bull, Staub 2013, 47, 62, 93. On the plumbing in more detail, pp. 94–95. There are two separate feeding lines to the set of two boxes redistributing water into the house (Fig. 23), but the co-ordination between the boxes and the destination of the branches stemming from them strongly favour the hypothesis of coevality.

⁷⁷ Amato *et al.* 2022.

⁷⁸ The height of the benches running along the west and north kitchen walls are 0.95 m above the level of the kitchen floor (V 1,7.9 Room l, Staub 2013, 194), but approximately at the same level as the floor of the adjacent hallway (Room h) of the service area and the further West Wing and adjacent peristyle area.

⁷⁹ On the diving pipes, Staub 2013, 91–92, 94.

⁸⁰ An east-west running boundary between the pre-West Wing extent of the House of Tofellanus Valens (V 1,28) and Domus V 1,3 may be

⁷⁵ R. Forsell, 'V 1,3 House—Room c', *www.pompejiprojektet.se*. Beam holes in the west wall document a landing at c. 1.55 m above floor level.



Fig. 32. House of the Bronze Bull, Room i. In view towards west, staircase descending from the level of the hallway (Room h) of the West Wing service area towards the walled-off corridor of Domus V 1,3, and the landing that marks the turn of the path for further descent towards the cellar. Photograph: Hans Thorwid.



Fig. 33. House of the Bronze Bull: walled-off doorway, closing the passage to Domus V 1,3. Arrows highlight the tufelli frame of the former opening. V 1,7.9 Room i, south wall. Feature highlight: Henrik Boman. Photograph: Hans Thorwid.

pipes were reinforced on the angle by an extra lead “cap” covering to prevent them from bursting.⁸¹ The same cautionary reinforcing technique was repeated for the pipe intended for the mid-*impluvium* jet in Domus V 1,3, Room 2 (Fig. 26).

Acknowledging that the thorough remake of the south-west corner of the *insula* included the supply of pressured water addressed to Domus V 1,3 has consequences for the dating suggested for the creation of the West Wing of the House of the Bronze Bull. Staub’s understanding of a single building phase achieving both⁸² is contradicted by the fact that the building sequence in the service corridor (Domus V 1,3 Room b) indicates a considerably earlier date for the West Wing than for the introduction of pressured water. Somewhat hesitatingly, Staub situates the West Wing and water-building phase in the Augustan/

Tiberian/Claudian period due to arguments derived from the sparsely conserved or today destroyed wall decorations. He sees the zenith of the House of the Bronze Bull in the period when the atrium area was redecorated in the late Third Style. Added to August Mau’s stylistic assessment of some scant remains of Third Style decorations in the West Wing,⁸³ a coeval building phase encompassing both areas is suggested.

On the other hand, as advocated here, the recognition of two separate building phases—a pre-aqueduct creation of the West Wing, and the large remake of both the House of the Bronze Bull and its dependencies achieved in tandem with the introduction of private water lines—need not challenge

hypothesized in the run of the later interior separations within the West Wing of the House of the Bronze Bull along the ridge above the abrupt fall in level. The wall (between the kitchen, V 1,7.9, Room l, and Room k (Fig. 32), and further east between the hallway (Room h), and Room i, the latter opening for further descent eastwards to the cellar beneath Room f. For the configuration of the subsoil in these parts over the rim of an old volcanic crater, Amato *et al.* 2022.

⁸¹ Staub 2013, 94.

⁸² Staub 2013, 45.

⁸³ In the *caldarium* of the bath suite (V 1,7.9, Room 20) and the corridor leading to the suite (Room h) A. Mau mentioned remains of Third Style schemes. Mau 1882, 361, 409, 413. He describes the latter as simple (*einfach*) and lists them in a series of examples of Third Style decorations continuing Second Style schemes. Also note the tenuity of the stylistic dating in this case. H.G. Beyen (1960, 74 and 74 n. 7) saw the corridor decorations as of Second Style but maintained Mau’s assessment of those in the bath as of Third Style. N. de Haan, (2010, 189) followed Beyen’s datings, saw the decorations inside the bath as part of a remake and underlined the old-fashioned way of building (argument to be returned to below).



Fig. 34 (left). Domus V 1,3, Room b: service corridor. The floor has been broken to house the pipe for pressured water entering Domus V 1,3 from the House of the Bronze Bull. Photograph: Hans Thorwid.

Fig. 35 (right). Domus V 1,3, Room b: passage of the water pipe beneath the incertum fill of the walled-off opening. Note the masonry standing in part on the earth fill covering the breach made for the pipe, in part on the floor of the former service corridor. Photograph: Hans Thorwid.

Mau's observations. The timespan covered by the Third Style, generally estimated as trend-leading between the 30s BC and the AD 40s, i.e., over two to three generations, is time enough to permit two separate building phases.⁸⁴ It is worth noting

⁸⁴ As there is evidence both for an important Second Style remake in the atrium and peristyle areas of the House of the Bronze Bull (Staub 2013, 66–69), and some Fourth Style retouches of pipes and decoration pertaining to the nymphaeum (48, 73–75), T. Staub settles for four phases, one per Style.

that the floor of the corridor beneath which the main pipe of the private aqueduct line must be housed (Fig. 23) in passing from the kitchen (Room l) to the peristyle (Room b), has been assessed as more recent than the wall delimiting it to the south since it abuts remains of the wall's plaster coating, not the wall proper, which means that this floor may have been refashioned after positioning the water pipe.⁸⁵

⁸⁵ Staub 2013, 93, fig. 37. However, T. Staub sees the wall (back side of the north wall of Room f), and its faded decoration as linked to

Fig. 36 (right). *Domus V 1,3*: walled-off doorway, former communication on the upper floor between Room 5 and the adjacent Room c. South wall of stairwell V 1,3, Room c. Note the tile foundation and cocciopesto layer of the former upper-floor doorway. The beam hole corresponds to the new floor level of the upper floor cubiculum on the other side of the wall, V 1,3 Room 5. Photograph: Hans Thorwid.

Further building archaeological arguments strengthening the idea of two (Third Style) building phases will be added when discussion turns to scenarios of agency below. But first, we need to underline the results made by Staub in his close examination of the today unfortunately much-faded or even destroyed (but documented by 19th-century copying) wall decorations in the *cubicula* of the main atrium of the House of the Bronze Bull, affirming that this prestigious part of the house underwent a redecoration phase during the period of the late Third Style. In our context, it is of particular interest to acknowledge a *cubiculum* (Room 8) decorated in the same miniature ornamental taste (Fig. 37) that we already know from the much more accomplished version in the South House of Caecilius Iucundus (V 1,26, Room i, Fig. 5).⁸⁶ Based on stylistic considerations—mainly the materials used for the mosaic of the large nymphaeum wall: shells, glazed clay and glass *tesserae*, as well as larger glass components—Staub suggests a Tiberian/Claudian dating for the whole ensemble,⁸⁷ well in line with that suggested for the innovations of architecture and social relations discussed in this text.⁸⁸ It is worth reiterating that this dating also accords well with that established for the similar development in the House of Caecilius Iucundus.

As much as the recognition of one scheme for the water-distribution system makes it difficult to advocate a post-earth-

the first extension towards west of the peristyle area of the House of the Bronze Bull in the Second Style period. He sees this extension as including rooms opening on the peristyle: Room f and three shallow rooms, remains of which are situated beneath the east extremity of the later Room g. Staub 2013, fig. 40: hypothetical plan. However, in the light of arguments presented in the present study, the annexation of the area to become Room f and the cellar beneath is better understood in relation to the full creation of the West Wing.

⁸⁶ Staub 2013, 70–71, 76. Discussing single walls: Staub Gierow 2008a, 29; Bastet & de Voss 1979, 88. For characteristics of the late Third Style: Ehrhardt 1982, 76–79. For more photographs of the decorations in V 1,7,9, Room 8, see, *PPM* vol. III, 1991, V 1,7, Casa del Toro, figs. 30–39.

⁸⁷ Staub 2013, 73.

⁸⁸ Only one important modification to the pipe network has been observed. It concerns the pipe feeding the upper part of the nymphaeum façade. Next to the broken pipe, its substitute is still extant. T. Staub sees this substitution as coeval with Fourth Style repairs of the decorations of the upper part of the nymphaeum façade (some extant, some formerly reported but lost). Staub 2013, 74–75.





Fig. 37. Wall decoration attributed to the ornate late Third Style. Detail of east wall of Room 8, one of the *cubicula* flanking the main atrium of the House of the Bronze Bull. Photograph: Hans Thorwid.

quake date for the remake of the south-west *insula* corner, the building archaeological characteristics of this same remake, i.e., the preponderant use of brick, hardly allow a dating that would adjust to the date where scholarship generally places the creation of the Pompeian aqueduct: in the early Augustan period. As argued above, a dating in the Caligulean/Claudian period better agrees with the evidence of building technique, material and decorations. In parallel, it indicates coevality with similar developments at the neighbours' estates. The desire to separate domestic working activities from livelihood focused on production and selling in the shops and workshops finds expression in the management of all larger houses of Insula V 1, meaning that we observe the generalized and coeval material expression of change in social relations. This paper sees the city aqueduct as the promoting factor that made this change in social relations possible. Although much detail has been invested above in following the private lines of pressured water and drains in a subsidiary atrium focused on business (Domus V 1,3, Room 2), the main importance should be attributed the agency of the public part of the aqueduct system, the street fountains providing household water to the people living in the new, walled-off street-front apartments. If so, there should be concordance in timing between the creation of the public main of the city aqueduct and the private water lines in the grand houses of Insula V 1. This issue will be addressed later in the article.

Agencies and scenarios behind remodelling—Insula V 1 and beyond

THE EXEMPLARY CASES

Scrutiny of the remains of Insula V 1 clearly demonstrates the decisive importance of the water supply on the configuration of the architecture as well as on lives lived there. It is natural that the new aqueduct impacted life in many ways. In studies of Pompeian archaeology, the patron's wish to raise the prestige of their way of life is often considered a driving force in architectural planning and remodelling, including redecoration and use of pressured water for garden adornment. It is obvious that it is easier to detect agency behind the initiative to build than to substantiate the status and aims of the people for whom the new kind of dwellings under study here were intended. Still, overspill from the former inquiry may also put some focus on the latter.

Regarding the House of the Greek Epigrams there is no obvious sign of gain of social capital and prestige made in the changed direction of the staircase, from a presumed inner one to the one entered from the street (by entrance V 1,12). Both belonged to a wing of the house some distance from its prestigious core: the main entrance, atrium and peristyle garden. When as here, above the service quarter, multi-room apartments are sited where no related street-front activity was conducted—since there are no corresponding *tabernae*—we may conclude that these apartments were meant for some category of people other than shopkeepers and household members.⁸⁹ Tenancy, as amply advocated by Pirson, comes easy to mind.⁹⁰ If so, the remake also reflects a new potential for house owners to generate income from their property.

In the estate of Caecilius Iucundus, the situation was different. The upper apartment covered space which more rightly should have belonged to a wing of *cubicula*. If a wing of this kind ever existed, it was utterly changed at the latest in a Republican-period remake. From then on, the north atrium wall of Domus V 1,23 (Fig. 8) counted but a single doorway to the area that had now become the rear part of Taberna V 1,20.⁹¹ The final walling off also of this passage most likely belonged to the plan behind the making of the double-atrium house. Like the permanent closure of two more doorways formerly offering passage between the north atrium (V 1,23.10, Room b) and the street-front workshops, the blocked former doorway of the north atrium wall was covered by wall decorations at this occasion. Although today mostly lost, a somewhat better-preserved state is recorded in the 19th-century cork model

⁸⁹ Wallace-Hadrill 1994, 106.

⁹⁰ Pirson 1999.

⁹¹ Leander Touati *et al.* 2021, 192–193, 207–208.

Fig. 38. Atrium behind entrance V 1,23 (North House of Cecilius Iucundus), walled off Taberna V 1,22 and (right in picture). West Triclinium (V 1,23, Room k) and the adjacent taberna with rear rooms behind entrance V 1,20 in the state at unearthing, as documented by the 19th-century scale cork model in the MANN. Note the painted plaster coating partly covering the walled-off doorways once leading from the atrium to Taberna V 1,22 and Room e of Taberna V 1,20. View towards west. Photograph: Hans Thorwid.



(Figs 8, 38).⁹² A black dado covers most of the lower part of the walls including the masonry blocking the doorways, which formerly ensured communication. These measures, walling off and concealing former openings with covering decorations, indicate the patron's desire to underline separation and to indicate control of space, movement and privacy in the house. If it was just a question of excluding former dependants from the atrium, one might think that locking a door would have sufficed, but obviously, the ostentation of the new arrangements was important here.

WALLING OFF AND WATER USE IN THE HOUSE OF CAECILIUS IUCUNDUS

The transformations made to the subsidiary atrium of the House of Caecilius Iucundus prompt some interpretation and conjecture. Apparently, effort was made to adapt the architecture in such a way that the focus of those entering the north

entrance (V 1,23) to this double-atrium residence from the street was directed towards the wide opening of the *tablinum* (V 1,23, Room e) in front. Walling off also included the corridor (Room i) alongside the *tablinum* and the doorway leading to the *cubiculum* immediately to the right of the entrance, now turned into rear room of Taberna V 1,24. Walking through the *tablinum*, transformed into a hall of passage, the visitor had access first to a forecourt (Room g), then to a larger courtyard (Room l) of semi-public function as judged from two *programmata* painted onto the walls delimiting the north-west corner of this open space.⁹³ The rarity of electoral posters presented inside Pompeian houses suggests that this courtyard was fashioned for particular and public ends.⁹⁴ The courtyard may well have served Iucundus' professional needs, as the place where his trade

⁹² A representation made at a slightly different viewing axis than in Fig. 38 confirms the observation. Malfitana *et al.* 2020, 143.

⁹³ Lost today but published in the 19th century: *CIL* IV, 3416–3417. The candidates mentioned cannot be closer dated than belonging in the period of the large bulk of Pompeian electoral posters, *programmata recentiora*, that is, from the AD 50s to 79.

⁹⁴ Of some 2,500 known *programmata* only 37 examples are from interiors. Among these, most were put in entrances, not in the deep interior as here. Viitanen & Nissin 2017, 118, 132 n. 48. The most important parallels are found in the House of Iulius Polybios (VI 17,36).



Fig. 39. The open courtyard (V 1,23 Room l) at the North House of Caecilius Iucundus. The programmata were positioned on both sides of the west (shadowed) corner. View towards north-west. Photograph: Hans Thorwid.



Fig. 40. Semicircular-based water dispatch situated at the east side of the courtyard (V 1,23, Room l) in the North House of Caecilius Iucundus. The pipe (now missing) entered from the north. A drain (in part hidden by the later cocciopesto floor) formerly channelled rain-fall towards the cistern by a mouth, later reused for the waste of the dispatch. Note, further north (left in picture), the pipe passing beneath the threshold of the corridor leading to the kitchen (V 1,23, Room n). Photograph: Hans Thorwid.

as auctioneer could be conducted in front of a small audience of potential buyers and witnesses (Fig. 39).⁹⁵ A water dispatch, a tap or small drinking(?) -water fountain,⁹⁶ by the wall that de-

⁹⁵ Andreau 1974.

⁹⁶ In the House of the Bronze Bull (V 1,7), a similar fitting (including a working bench in front of the water pipe) is preserved in full height (0.53 m). It is situated in the south-east corner of the service hallway (Room h), Staub 2013, 188, fig. 87. For this, and one further representation, see, www.pompejiprojektet.se. One more feature, set into the east wall of the peristyle (Room b) at 1.15 m above floor level and interpreted by Staub as a hand basin, could be added to the group although modern concrete impedes closer study. Only a water outlet (no inlet) has been observed. Staub 2013, 160, www.pompejiprojektet.se (the niche furthest north in picture).

limits the courtyard to the east (Fig. 40), may well have been made for the convenience of this kind of visitor.

Arguments on continued status of dependency for Taberna V 1,20 despite the walling off may be gained from shared rain water collecting facilities. The northern of the two easternmost rear rooms of Taberna V 1,20 (Room f) functioned as both rainwater-catchment area and light intake to the ground floor. More properly described as a shaft (1.9 × 1.2 m) than a room,⁹⁷ it was cramped between the *taberna*'s other eastern ground-floor room (Room e), the boundary shared with the House of the Greek Epigrams, and the rear wall of the elegantly decorated West Triclinium of the North House of Caecilius

⁹⁷ Boman & Nilsson 2008b, 142, figs 5–6.



Fig. 41. Courtyard façade of the West Triclinium (North House of Caecilius Iucundus, V 1,23.10, Room k). Photograph: Hans Thorwid.

Iucundus V 1,23.10, Room k.⁹⁸ Accessed from the forecourt (Room g), the latter faced and dominated the semi-public courtyard (Room l) by means of an upper-floor balcony with a large ground-floor window beneath (Fig. 41). The presence of two cistern mouths—one, still covered by a *puteal* (Fig. 39), adorns the forecourt that links the atrium-*tablinum* area of the house with the larger courtyard (Room l); the other is situated immediately west of the water-catchment area in the rear of Taberna V 1,20 Room f—may signify a shared cistern.⁹⁹ Anyhow, both shafts profited from a rainwater-collecting system organized from the main house, since roof gutters along the

eaves of the West Triclinium (Room k) most likely channelled water in both directions.

Along the north side of the West Triclinium (V 1,23.10, Room k), a pitched roof is indicated by some beam holes set in a row into the boundary towards the House of the Greek Epigrams. Since the high courtyard façade of the West Triclinium (Fig. 41) abuts the boundary well above the eave, thus thwarting rainwater passage in that direction, the roof was presumably equipped with a gutter channelling water westwards, to the shaft of the rear shop (Taberna V 1,20, Room f). On the south side, the façade of the West Triclinium was widened by the secondary addition of a brick-and-block pillar. Still attached to it, the lead funnel of a downpipe demonstrates that rainfall was channelled from the balcony facing the courtyard and supposedly also from the south eave. The lower part of the down-pipe is still well preserved in its descent down the ma-

⁹⁸ Leander Touati *et al.* 2021, 208. A *graffito* observed in 19th century inside the room reads *locus est Rufinae*: CIL IV, 4077. Traces of bronze mountings in the bottom zone of the north-west corner have been interpreted as indication of some kind of furniture, possibly a coach, *kline*. Karivieri & Forsell 2008a, 125.

⁹⁹ Leander Touati 2008, 118. Obliquely drawn, the line between the two cistern mouths amounts to approximately 11 m.

sonry of the brick-and-block pillar, and as it enters the cistern shaft underground, beneath the *puteal*.¹⁰⁰

To conclude, we may suspect a dependent status for those working in Taberna V 1,20 and its rear rooms on the ground floor, and tenancy for those above accessing the upper-floor dwelling through a staircase at entrance V 1,21. The many fountain jets of the main house—one to each of the two *impluvia* (in V 1,23.10, Room b and V 1,26, Room l), presumably three in the peristyle garden (V 1,26, Room l), and the small dispatch in the auctioneer's courtyard (V 1,23.10, Room l), to which the destination of the kitchen line, a water reservoir alongside the hearth (Room n) should be added—express the wish to provide ease and to impress in both parts of the double-atrium house. However, pride of place was unquestionably given to the southern part, as shown also by the many mythological wall paintings and the lavish mosaic floor of the main atrium (V 1,26 Room b), transformed into an elegant “entrance parlour” devised for prestigious socializing.¹⁰¹

WATER TO THE HOUSE OF THE BRONZE BULL

The ambitious brick-built nymphaeum and the many jets in the peristyle garden of the House of the Bronze Bull (V 1,7.9, Room b)—as well as the beautiful marble *impluvium* with its (eponymous) fountain sculpture (Room 4)—is the most spectacular and impressive example of the Imperial-period building phase in Insula V 1. As in the House of Caecilius Iucundus, the aim to impress and provide ease spilled over to the subsidiary house (Domus V 1,3) as well. In parallel, the possibility of profiting from tenancy and perhaps of attracting specialized workers with the offer of spacious dwellings and updated comforts factored in the remake of workshops and dwellings above.¹⁰² As shown by the built fixtures, skilled tex-

tile processing was undertaken in at least three workshops on Via di Nola, while small finds from Taberna V 1,30 on Via del Vesuvio suggest a totally different kind of activity.¹⁰³ The food retail business of Thermopolium V 1,1.32 adds to the variety that confirms the tendency observed in more larger Pompeian estates to diversify the activities of the dependent workshops.¹⁰⁴

It is clear that the opening and closing of the service corridor V 1,3, Room b reflects a two-staged scenario in the life of Domus V 1,3. Even though the final interdiction of passage may have caused inconvenience for direct deliveries through the subsidiary atrium (V 1,3, Room 2) to the kitchen of the House of the Bronze Bull (V 1,7.9, Room l), this need not be seen as a sign of house decline.¹⁰⁵ The purpose of the corridor may be understood in a different light if considered according to a pre-aqueduct-period lay-out of the West Wing of the House of the Bronze Bull. The means of water supply at hand in that period allow us to see the explicit motivation for the opening of the corridor: the wish to exploit the potential of the two rainfall-collecting areas of Domus V 1,3.¹⁰⁶ Drawing water for the bath suite created in the West Wing from the nearby cistern mouths of the subsidiary atrium (V 1,3, Room 2) would not cause disruption to the routines of the convivial part of the house, as would happen if those of the peristyle or the more distant main atrium (V 1,7.9, Rooms b and 4) were used.

Tufelli masonry, characteristic of the West Wing for doorway frames and short walls in between (Figs 24, 32), recurs not only in the frame of the corridor opening (Fig. 33) giving access to Domus V 1,3, but also in the effort made to strength-

¹⁰⁰ A. Mau (1876, 243–244) hypothesized a roof gutter leading all the way from the eve of Room q on the east side of Courtyard l to the funnel. A part of the bed of this gutter (protected by a modern imbrex (Fig. 39) is still extant. In a photograph taken in 1957 by S. Jashemski, the downpipe was still complete from funnel to *puteal*. The Wilhelmina and Stanley A. Jashemski Archive in the University of Maryland Library, Special Collections. www.pompeii-inpictures.com/pompeii-inpictures/R5/5%2001%2023%20p2.htm. The cistern also profited from the overflow of the small dispatch of pressured water situated on the opposite, east side of the courtyard (Fig. 41). This cistern entry, investigated in 2016, modifies the earlier statement (Leander Touati 2010, 125) that no aqueduct water entered the cistern.

¹⁰¹ Expression borrowed from Wallace-Hadrill 2011, 210.

¹⁰² “Construction of these workshops generally involved large-scale investment and major adaptations to the houses, and their scale also meant that they could not be staffed from a small nuclear family: In order to run them, extra labour (either hired or bought), would

have been necessary”: Flohr 2013b, 73, quoting the textile complex behind entrances V 1,2 (*fullonica*), V 1,4 (*tinctoria*) and V 1,5 (*tinctoria*) related to the House of the Bronze Bull and a restricted number of similar complexes. F. Pirson (1999, 157) qualifies the dependencies of the House of the Bronze Bull as one of the most commercialized in Pompeii.

¹⁰³ The rear room of Taberna V 1,30 (Room 2), not fully exposed by the excavations of 1784 nor later, yielded a series of interesting small finds during our fieldwork in 2010, among which were escutcheons and hinges for small boxes and, found leaning against the inner wall of the room, two sheets of selenite, so-called *pietra speculare*, used as window glass in Roman antiquity.

¹⁰⁴ Flohr, 2013b, 71–72.

¹⁰⁵ Staub 2013, 48, 106.

¹⁰⁶ The abrupt fall of the natural terrain may have influenced both location and planning of the bath (V 1,7.9, Rooms 19 and 20), since it offered obvious advantages to the builder. It facilitated the installation of the heating system: the *praefurnium* (furnace of the *hypocaust* system) could be placed at convenient height on top of the north kitchen bench (Room l), a level that, on the opposite side of the wall, corresponds to the floor on which stand the pillars (*suspensurae*) of the *hypocaust* system.



Fig. 42. West wall of the atrium of Domus V 1,3, Room 2. The tuffelli-framed doorways mark a remake and strengthening of the wall. Photograph: Hans Thorwid.

en the west wall of the atrium (Room 2, Fig. 42). Both cases underline the importance attributed the subsidiary atrium during the westward expansion of the House of the Bronze Bull.¹⁰⁷ When used elsewhere in Insula V 1, this kind of masonry used for structures of the same kind belongs to architecture ascribed a date in Pompeii's early colonial period (c. 80–30 BC).¹⁰⁸ In the case of the House of the Bronze Bull a date

¹⁰⁷ Note that the Imperial dating ascribed the *tuffelli*-framed doorways of Domus V 1,3 in the caption accompanying fig. 29 in Leander Touati *et al.* 2021 has proven erroneous.

¹⁰⁸ Leander Touati *et al.* 2021, 209–210. Earlier commenting on the *tuffelli* of the bath suite: Mau 1882, 413; Beyen 1960, 74; de Haan 2010, 189. Note that what is discussed here is the use of *tuffelli* as sole material for framework of doorways, and often accompanied with short buttressing walls between doorways when closely situated, identified here as an “old-fashioned” way of building. Otherwise, *tuffelli* as such are common enough in Imperial-period masonry—in brick-and-block, as fill material (for example, between the brick pylons of the Via del Vesuvio façade of Thermopolium V 1,1.32, Fig. 9a), and used for some towers of the aqueduct system. For the towers' use of brick- or *tuffelli*-faced concrete seeming to vary without chronology-establishing consequence, Heres 1992. For *tuffelli*

in the early Augustan period would fit well. In the eyes of this beholder, it results awkward to accredit this *tuffelli* masonry (Fig. 43) to the same building effort as the large undertaking in which the use of brick-based masonry of the south-west *insula* corner, or that of the grand nymphaeum wall of the main house peristyle (V 1,7.9, Room b, Fig. 44)—constructions assuredly created in tandem with the introduction of the private aqueduct line.

Apparently the *tuffelli* in Domus V 1,3 were used to wall up and strengthen a standing wall with door openings, giving access to the three *cubicula* of the atrium (Figs 30, 42). The added masonry increased the width of this wall by about 0.1 m.¹⁰⁹ Inside the *cubicula*, the new wall shell stands on top

originating from different quarrying areas—grey or brownish Nuceria tufa or the more friable yellow kind, presumed more common in Pompeii after the AD 62/63 earthquake, Carrington 1933, 127, 131–132; recently on the latter kind, designated NYT (Neapolitan Yellow Tuff), and its post-earthquake use in late Pompeii, see Amato *et al.* 2022, 7–8, 19–20, fig. 11. In our case the tufa is of the dark, Nuceria type.

¹⁰⁹ Inside the *cubicula* the new wall stands on top of the earlier *cocciopesto* floor (Fig. 30) and it abuts and covers the remains of an ear-



Fig. 43. Team of the Swedish Pompeii Project at work cleaning the atrium of Domus V 1,3, Room 2, in 2009. Photograph: Hans Thorwid.

of older floors and cuts old decorations when abutting perpendicularly set walls. In line with the hypothesis presented here, the remake of this wall obviously needed to ensure the wall's load-bearing potential—perhaps resulting from a new *compluviate* roofing intended to further maximize rainwater intake.¹¹⁰ Anyhow, the final closure of corridor V 1,3, Room b results from the introduction of the aqueduct line, including pipes to the bath, which made the former use of the atrium area of Domus V 1,3 obsolete. The resources of Domus V 1,3 were now primarily turned to serve the workshops.

INSULA V I AND BEYOND

To conclude, in Insula V 1, we witness the creation of upper-floor apartments, entered either via a flight of stairs opening directly onto the street (V 1,12, V 1,21), or from a location close to the street, inside a *taberna* (V 1,31),¹¹¹ at the same time matched by the permanent closing of direct passages

lier, bright red decoration on the north wall of the north *cubiculum* (V 1,3 Room 5). R. Forsell, 'V 1,3 House—Room 5', *www.pompeii-projektet.se*.

¹¹⁰ It is worthwhile to remember how the rim of the *impluvium* of Domus V 1,3 comprises both ill-fitted stone slabs and slabs of different width and faceted borders. As already mentioned above, the mixed ensemble probably resulted from reuse.

¹¹¹ Another two *tabernae*, Taberna V 1,25 to the left of the main entrance to the South House of Caecilius Iucundus, and Taberna V 1,6, to the left of the entrance to the House of the Bronze Bull, have bases for staircases, which may be indicative of upper-floor apartments

between “city-turned” working premises and the withdrawn residences. In a socio-historical perspective, both phenomena represent the separation of resident and commercial occupation and mark a partial releasing of the houseful organization, generally taken as the rule in Pompeii. As witnessed by the closed rears and many older cistern and well mouths occurring especially in the workshops towards Via di Nola, it may be that no passage was the ideal model for an aristocratic mode of life.¹¹² However, this was not the model for most. In his overview of all upper-floor apartments in Pompeii and Herculaneum, Pirson underlines the clear growth in the number of rentable apartments with their own entrances in the 1st century AD.¹¹³ A related observation is made by Roger Ling, who noted an increased tendency in the mid-1st-century AD Pompeii to introduce stout ground-floor pillars to allow building upwards. He hypothesized that the city was becoming overcrowded.¹¹⁴ Both within the House of Caecilius Iucundus and above its neighbouring working premises, and above the working areas around the House of the Bronze Bull, enclosure indicates the causal relation between the two new

rather than of a traditional one-room design above the shop. Unfortunately, in these cases, the size of the premises cannot be established.

¹¹² For examples of external staircases in Late Hellenistic period houses in Pompeii: Pirson 1999, 125–126.

¹¹³ Pirson 1999, 175. The dated occurrences in Insula V 1 confirm his idea that the development started earlier than the AD 62/63 earthquake. Pirson 1999, 124–133.

¹¹⁴ Ling 1983, 54. Also Carrington 1933, 136; Pirson 1999, 125 and n. 481 with additional bibliography.



Fig. 44. Nymphaeum wall of the House of the Bronze Bull, V 1,7.9, Room b. Photograph: Hans Thorwid.

ways of managing space. It could point at an increased population, but just as well at a partial, voluntary shrinking of the housefuls that formerly characterized the grand houses.

The socio-political development observed in Insula V 1 fits the descriptive of a passage from a society based on powerful, large-scale family groupings towards a more communally controlled society in which old household ties might weaken. In the earlier situation, enlarged family units represented the traditional base of the social order. Although life was city-bound and communally directed, each large household strove towards self-sufficiency, foremost witnessed by the many atria, each with its own water-collecting system. In the Imperial-period city, on the other hand, all inhabitants learned to put faith in the communal concern for infrastructures; among which, most importantly, was the new aqueduct system. With its potential for providing a nearby supply at street-crossings of fresh water to all city-dwellers, the less fortunate were no longer assigned to the water reservoirs of the large houses; the aqueduct had become a decisive factor for promoting new social ways, mirrored in the partial transformation of traditional domestic space. What the construction of separate apartments could have entailed architecturally had it continued beyond AD 79 is open to conjecture.¹¹⁵ Perhaps another generation or two of prolonged city life would have produced a spatial organization including large apartment houses leading the Pompeian city-

scape closer to that we know from 2nd-century AD Ostia, and already at play in Herculaneum in AD 79.¹¹⁶

The recurrence all over Insula V 1 of the same kind of new structures, studied in detail above, together with the dating of their making to the AD 40s in the House of Caecilius Iucundus, adds a new argument to those confronting the idea of the earthquake of AD 62/63 as the major event that mediated change in the urban and social fabric of the city.¹¹⁷ Recent

¹¹⁶ For a similar view on the architectural development in Pompeii, referring to the example of the Casa a cinque piani VIII 2,17–21, Pirson 1999, 133–136, 161. For an example in Herculaneum: Wallace-Hadrill 2011, 261, 272–275.

¹¹⁷ This hypothesis argued by A. Maiuri (1942) and often repeated in later studies, is firmly questioned today. See, for instance, Wallace-Hadrill 1994, 122–123; Mouritsen 1996; Pirson 1999, 175. The destructive effect of the earthquake mentioned by Tacitus (*Tac. Ann.* 15.22) and Seneca may primarily have impacted the today mostly missing upper floors in Pompeii. It should be noted that Seneca, who gives the most detailed description of the calamity (*Sen. Nat.* 6.1.1–4, English translation online by J. Clarke [1910]; see also the LCL translation by T.H. Corcoran [1972]), reports that Pompeii was laid down (*ex aperto reductum*), the surrounding district (the bay from Surrentum to Herculaneum) disturbed (*vexatis*), and that the whole of Campania knew widespread destruction (*magna stragem vestavit*). Then turning to examples, Seneca presents the situation not in Pompeii, but in Herculaneum (*Nam et Herculaneensis oppidi*), stating that: part of the town fell, and the buildings left standing were very insecure (*pars ruit dubieque stant etiam quae relictæ sunt*). This passage merits consideration alongside A. Wallace-Hadrill's assessment when comparing the wall decorations discovered in Her-

¹¹⁵ Cf. Wallace-Hadrill 1994, 110.

investigation of the geomorphological situation of Pompeii, detecting zones prone to damage through seismic activity,¹¹⁸ may be taken as one more argument against a building archaeology using the earthquake dates as absolute means of chronology. Use of new building techniques, such as brick-faced concrete,¹¹⁹ and major (private) reconstruction campaigns observed in the city should not indiscriminately be understood as responses to earthquake damage. Instead, the introduction of the aqueduct system—supplying a city-wide coverage of public water that was able to be fetched close by, by all—is suggested here as the decisive factor of parallel changes occurring in domestic architecture and household composition, that is, in social relations in the post-Augustan period. These described or conjectured scenarios call for a summary of the current state of knowledge on the working and dating of the city aqueduct—as follows.

The city aqueduct as material actor

IMPACT AND FUNCTIONALITY OF THE CITY AQUEDUCT

The engineering of the new communal water pipes, remarkably well adapted to the topography of the steeply sloping city hill, made it possible to supply not only numerous public fountains and baths but also an important number of privately owned residences.¹²⁰ The seeming modernity of Pompeii's private water pipes and the enriched architecture they spurred are among the striking surprises to tourists and amateurs visiting the site. Yet, the use of these lines was not that modern. The aim of the private aqueduct lines was primarily to supply gardens and jets. After this use, the wastewater could be channelled to the old cisterns, but just as often it was voided into the streets through which it drained out of the city. The

culaneum to those of Pompeii: “the same story of gradual evolution of fashion could not have been told starting from Herculaneum. Surviving decoration from the second or even first century BC is exceptional in Herculaneum. [...] Either the houses of Herculaneum were more extensively redecorated in the first century AD than those of Pompeii, or, just possibly, real wealth did not reach Herculaneum until later”, Wallace-Hadrill 2011, 302. On the two historiographers' diverging dating, see Wallace-Hadrill 2003.

¹¹⁸ Amato *et al.* 2022.

¹¹⁹ Amato *et al.* (2022, 5–6, 19–20, 22–23) link earthquake damage in geomorphologically vulnerable zones with reinforcement in Neapolitan Yellow Tuff (NYT) all over the city, observing, of course, that there was more seismic activity in Late Period Pompeii than just the earthquake(s) of the AD 60s. Insula V 1 is not situated in a zone suggested to be vulnerable. There is little, if any earthquake damage reported inside the House of the Bronze Bull. Staub 2013, 48.

¹²⁰ The latest count of private water connections in Pompeii gave the result of 91 connected houses: Jansen 2002, n. 204.

latter procedure was adopted in the House of Caecilius Iucundus. Aqueduct water passed the many fountain jets and was then dismissed into the surrounding streets, while rainwater-collecting fed the one cistern still in use, supplied from the roofs surrounding Courtyard I of the North House with cistern mouth in the forecourt (Room g), possibly boosted with water collected in Room f at the rear of Taberna V 1,20, with cistern mouth in Room d. In most of Pompeii, good household water was carried in from the many nearby crossroad fountains fed by the public aqueduct line. However, both the House of the Bronze Bull and the House of Caecilius Iucundus had kitchen lines. This unusual circumstance should be attributed to the *insula's* location close to the beginning of the public aqueduct line and to the plentiful supply this location entailed. According to recent calculation on water quantity in the Pompeian aqueduct system, the private lines were important not only to furnish comfort and prestige in the connected houses, but also to the regulation and balance of the overall system; especially so, in the upper part of the city aqueduct where the flow was at its maximum, meaning, as argued by Richard Olson, that “the water use for some private users must have been considered from the beginning.”¹²¹

Notwithstanding, the new domestic water pipes enhanced traditional rather than challenged old social ways. They underlined the convivial and thereby the political potential of the large reception areas of the residences, their atria and peristyle gardens. Piped water was only exceptionally and secondarily used for production, as in the workshops situated in the south-west corner of the *insula*. Within the estate of the House of the Bronze Bull, it further underlined the link between residence and surrounding shops, a dependency dating back almost 200 years. Private consumption of pressured water signified status, wealth and prestige. The private water line appears to fit the description of stabilizing intermediary to human relations, not that of materiality mediating social change.

The public crossroad fountains, evenly distributed all over the city, were assuredly of larger societal importance for subsistence outside the large houses. It is this supply that should be understood as the main factor behind the last major material turn observed in Insula V 1. Regardless of status, people were no longer dependent on the water supplied from the cisterns of the houses or a restricted number of deep wells for their household needs and other purposes. The two wells in the northern part of the *insula* had both been closed and sealed. The need for joint, shared living space was lessened, perhaps to the advantage of both patron and dependent householder. The fountains at street intersections had mediating agency. They were material actors promoting new physical distance in social relations.

¹²¹ Olsson 2024, 363.



Fig. 45. City-facing south façade of the *Castellum Aquae*. Photograph: Hans Thorwid.

The innovations that we are describing were not merely the creation of the aqueduct, but more so that of its distribution technology, permitting water coverage all over the city, via three main lines. From the first distributor, the *Castellum Aquae* (Fig. 45), the mains led water downhill by towers of appropriate height to create a gradient between their summits, thus slowing down the flow to suitable speed. Connections to different water users were facilitated in tanks on top of the towers where the flow was temporarily halted, given that the outflow of the main must have been ensured by a pipe of somewhat lesser dimension than that which had ensured the inflow.¹²²

Though no tanks are preserved, we may assume that the continuous flow of the main was devised at the bottom and that, at a somewhat higher position, outlet holes were made for the pipes destined to the public crossroad fountains, also providing continuous flow to their basins, which in periods of little water use would remit overflow into the streets. Pressured water was supplied to the surrounding private users through as many connected small-dimension pipes as consumer households and businesses. These pipes were probably situated in the upper part of the tank in such a way that individual pipes could be added or suppressed without causing major disturbance to the balance of the system. The flow of the main was conducted further down the city slope to the next tower tank and the next, where it continued to feed private lines, more

crossroad basins, and several highly water-consuming bath establishments, neighbourhood by neighbourhood. This water flow distribution delivered fresh water close to homes and diminished both the distance covered and effort invested in fetching water. Adapted to suit the city's location on the steeply sloping foot of the mountain-side,¹²³ it represented a serious piece of engineering, plausibly particular to Pompeii,¹²⁴ and if the chronology suggested here is accepted, also largely coeval with the sizeable and vigorous expression by the city-dwellers of their intense participation in local political life, another phenomenon if not unique, at least particular to Pompeii.¹²⁵

¹²³ The situation may be compared to that of Herculaneum where the drop in terrain of the city hill amounts to no more than 14.5 m (Camardo *et al.* 2006, 197). In Pompeii the slope amounts to some 35 m.

¹²⁴ Pompeii's exceptional state of preservation and large extent of excavated area, as opposed to those of other excavated cities, has meant that few valid comparisons can be found. Nonetheless, it should be noted that only three public fountain basins have been found in Herculaneum. All are located by main crossroads and are of notably larger size, 1.8–2.9 m³ (Camardo *et al.* 2006, 198), than most of Pompeii's 42 public basins, which range from 0.4–1.2 m³ (Olsson 2015, table 6).

¹²⁵ At least regionally. To the c. 2,500 *programmata recentiora*, electoral posters painted on the façades of Pompeii, only one potential parallel is known from Herculaneum—indicating different political habit. Wallace-Hadrill 2011, 291–292. After the appearance on Pompeian walls of a small series of electoral propaganda (*programmata antiquissima*) dating from a short period immediately following the obtention of colonial status around 80 BC, there is a hitherto unexplained hiatus until the large wave of *programmata recentiora*,

¹²² Otherwise, the tanks would have drained. I thank Richard Olsson for pointing this out to me.

To close this discussion with some speculation, one may wonder how much time was needed to implement a balanced water network down the steeply sloping hill, taking into consideration the to-be-presumed experimental praxis of Roman engineering. How were taps organized, when, as in the case of the residences in Insula V 1, the main public aqueduct line ran on the opposite side of a thoroughfare? How often would the city officials allow the use of a main street, such as the Via del Vesuvio, to be disturbed to satisfy various house owners' wish to connect to the system? Would the officials make an offer to all proprietors on the other side of the street, opposite to that of the city aqueduct's main, to draw their lines at one and the same time? In the case of the two grand houses of Insula V 1 a coeval development is not contradicted by the building archaeological evidence at hand.

Dating the aqueduct—a critical review of the current state of research

I hope to have established that the Pompeian aqueduct had agency not just in Insula V 1 but on the social habits of the city in large; however, it is still to be considered whether the dating of the aqueduct into the House of Caecilius Iucundus can be generalized and applied to a first introduction of a piped aqueduct coverage in all Pompeii. If so, a dating should be suggested for the creation of Pompeii's water-distribution system some three generations later than most textbooks place it. To consider this possibility, the arguments in favour of the usually accepted dating need to be reviewed and assessed.

The assumed placing of Pompeii's aqueduct and water-distribution system in the 20s BC conforms with the dating generally ascribed the creation of the large Campanian aqueduct of which the Pompeian one is thought to have formed a branch. Although the ancient historical record gives no explicit reference to its date of creation, it makes sense to ascribe the large aqueduct to the measures taken by M. Vipsanius Agrippa for the benefit of the Roman naval camps that he created in Campania, first, the Portus Iulius (37/36 BC) and second, the permanent navy camp at Cap Misenum (no date).¹²⁶ Both,

from the AD 50s and on. Although most of the electoral fervour recalled by the latter may be dated to the last elections, the preserved *corpus* corresponds to a larger time frame—some 30 years of political life and series of elections.

¹²⁶ Date of creation of the Portus Iulius: Suet. *Aug.* 16. Cassius Dio (48,50–51), describes it among the works undertaken by Agrippa during the war against Sextus Pompeius. The exact date for the transfer of the navy to Misenum is not recorded in Roman historiography, but it probably took place after the Battle of Actium, in which Agrippa held the high command, when Augustus reorganized the navy and gave it permanent status and fixed locations at Misenum and Ravenna (Suet. *Aug.* 49.1; Tac. *Ann.* 4.5.1). This argues a brief period of use

of course, were in need of a good water supply and Agrippa, *aedil* and responsible for Rome's water supply in the period of 33–12 BC, was certainly well acquainted with all kinds of water technology and its benefits. The needs of Puteoli, Rome's largest commercial harbour in the Early Imperial period, may also have counted.¹²⁷ If we see the creation of the naval camps as a *post quem* event, an *ante quem* in AD 10 is furnished by a monumental inscription including consular names cut into the wall of an underground tunnel belonging to the aqueduct system close to Baiae.¹²⁸ It therefore results that the actual construction of the Aqua Augusta, named by this and a short series of more inscriptions,¹²⁹ could have taken place anytime between 37/36 BC and AD 10.

The Baiae inscription also contains some pieces of technical and administrative information of relevance for a better understanding of the assumed Pompeian branch. In Duncan Keenan-Jones' translation it reads: "Access (to water) opened by permission and under the supervision (?) of Decimus Satrius Ragonianus, curator Aquae Augustae, on the third day before the Kalends of January, while Junius Blaesus and Servius Lentulus were consuls." Apparently, the event celebrated was the opening of a new branch to the main aqueduct—the inscription is located above the entrance of a side tunnel.¹³⁰ Additionally, the text makes it clear that new taps could be engineered not just at, but also following the creation of the main aqueduct. Furthermore, we learn that work of this order was supervised by a local magistrate.¹³¹ In conclusion, nothing refutes the notion that Pompeii obtained its aqueduct, if connected to the Aqua Augusta, at any date following the creation of the large main aqueduct.

Turning to Pompeian evidence, the discussion involves archaeological arguments mostly concerning the path of the aqueduct inside the city, as the exterior course from source to destination remains unknown. Instead, the monumentally conceived water-distribution centre, the Castellum Aquae, has become the main object studied in search of dating evi-

for the Portus Iulius; M. Reddé (1986, 170–171) hypothesizes some 20 years between its creation and that of the camp at Cap Misenum.

¹²⁷ Keenan Jones 2010, 3, 12. An inscription placed by the source of the aqueduct to commemorate restoration work in the Constantinian era mentions first Puteoli and last Misenum in a list of eight towns to which it furnished water (in which Pompeii for obvious reasons could not figure): Puteoli, Naples, Nola, Atella, Cumae, Acerra, Baiae and Misenum, to which three more lines supplying villas were added. *CIL* X, 1805; *AE* 1939, 131 = *AE* 1983, 194. Translation by Keenan-Jones 2010, 12.

¹²⁸ *AE* 1974, 266 = *AE* 1998, 366. Fusco 2013, 63–64; Keenan-Jones 2010, 7; Camodeca 1997, 19.

¹²⁹ Keenan-Jones 2010, 7–10.

¹³⁰ Keenan-Jones 2010, 7.

¹³¹ Keenan-Jones 2010.

dence. The suggestion that this building, or perhaps a precursor using the same channel of arrival, should be dated not in the Augustan period but to the early days of the colony, in the first half of the 1st century BC, spurred scholarly discussion at the turn of the recent millennium.

After analysis of the calcareous deposits in the main channel inside the Castellum Aquae, Christoph Ohlig suggested that a different, less depositing source than the Serino had furnished water to Pompeii in the Republican period before the provision offered by the heavily limescale-depositing Aqua Augusta.¹³² Successively, partly in response to Ohlig, but mainly with the aim to distinguish the original part of the building from the restorations carried out after the earthquake of AD 62/63,¹³³ Jean-Pierre Adam and Pierre Varène presented a detailed study of the Castellum Aquae, understanding the building, as well as both interior and exterior water structures related to it, as a coeval whole. This study favoured an Augustan dating, in line with the traditional understanding. Their first argument concerns the decorative arch-and-pilaster design that defines the revetment of the Castellum Aquae's main façade towards the city, stylistically compared by them with monuments in Rome; with the Tabularium (78 BC) as oldest model and the Theatre of Marcellus (17/13 BC) as apogee—no examples are mentioned for the successive decrease in use. Similarly, the iconography without plinths used for the decorative pilasters went out of fashion by the end of the Augustan era.¹³⁴ Nonetheless, they note that thus dated, the Castellum Aquae's inner dome would be the earliest known of its kind in Roman architecture.¹³⁵

I assume that, the extensive use of brick for the monument's main façade towards the city could be taken as an indication in favour of a later date than that suggested, but is not discussed in these terms by Adam and Varène, in spite of the fact that Adam, in a different context, mentions full façade revetment in brick as a post-earthquake feature of Pompeian

architecture.¹³⁶ It may be that the two authors do not discuss the façade of the Castellum Aquae in this light because a later dating than the Augustan was not a focus of their study. Instead, they turn to the question of why brick was chosen for the decorative façade. It could be that we are dealing with a public monument. As shown by Early Imperial building activity in the *fora* of Pompeii and elsewhere in Roman Italy, trends set in Rome served as models in local public building programmes.¹³⁷ However, Adam and Varène give little credence to the idea that the Castellum Aquae project was the result of a project managed and ordered from Rome. The bricks are not of uniform shape, that is, not ordered and made in one set for this project, as seen in some of the buildings of Pompeii's *forum*.¹³⁸ Furthermore, the two authors go to great lengths to demonstrate how a design such as the arch-and-pilaster design of the Castellum Aquae could be created on the drawing table by means of simple geometry, without the need to follow specific models brought from Rome, concluding that the building should be ascribed to local builders. To sum up on the question of dating, Adam and Varène arrive at the conclusion that the Pompeian aqueduct belongs in the Augustan period. Nonetheless, we could retort that a later date for the Castellum Aquae has not been tested and that the scrutiny of the building so far does not invalidate the possibility, advocated in this paper, of a dating one generation later than the Augustan and two later than most textbook claims.

Final remarks

The aim of this paper is to place focus on the immediate relation between the available water supply of the city and its social landscape; how the new infrastructure makes groups of people formerly going unnoticed in the material record gain visibility. It is not an attempt to invalidate any of the proposed solutions for the first introduction of aqueduct-carried water to Pompeii, merely to suggest that the balanced water-distribution system granting coverage of public fountains all over the city was completed later than generally believed. Nothing refutes that earlier and less sophisticated systems to furnish fresh water to the city may have existed. If the task for the engineer in charge was solely to diminish the rapidity of the water flow, simpler systems of gradient-correcting towers or stilling pools (cisterns) could have been used.¹³⁹ In future

¹³² Ohlig 2001, 84. It may be noted that the probably Imperial-date aqueduct of Herculaneum does not contain lime deposits, which is why it is today believed to have carried water supplied locally. Wallace-Hadrill 2011, 165.

¹³³ The assessment of the two phases of the building originated in a comparison between its extant appearance and that represented on one of the two so-called Earthquake Reliefs, attributed to the South House of Caecilius Iucundus, because similar in style and theme. The one authentically belonging to the house *lararium* depicts the effects of the earthquake on the Forum, whereas the other (of uncertain provenance), of interest to the present argument, depicts the collapsed north city gate and beside it, the Castellum Aquae.

¹³⁴ Adam & Varène 2008, 50–52.

¹³⁵ Adam & Varène 2008, 59–60.

¹³⁶ Adam 2007, 109: “brick as a uniform facing material for rubble walls came to be used only after the earthquake of AD 62.”

¹³⁷ This close relationship between the capital and local city centres was first highlighted by P. Zanker and has since been a much-revisited line of research. Zanker 1988, 3–46.

¹³⁸ Adam & Varène 2008, 52.

¹³⁹ On such, Chanson 2000.

research on the water supply to Pompeii, it could be worthwhile to consider the possibility of precursors to the aqueduct system such as we know it from its standing AD 79 structures, and in parallel, to make a critical assessment of all arguments put forth up to now on the dating of structures understood to be related to the water-distribution system.¹⁴⁰ In doing so, the lack of exact fix points for dating by kind of building material need to be accepted and, whenever possible, complemented with the firmer dating testimony of building sequences, working both on a local scale within contained spaces, such as the city block, and in larger, city-wide contextualization.¹⁴¹

ANNE-MARIE LEANDER TOUATI

Department of Archaeology and Ancient History

Lund University

Box 192

221 00 Lund, Sweden

anne-marie.leander_touati@klass.lu.se

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¹⁴⁰ For an important review of opinions and arguments on dating from the late 1st century BC into the Julio-Claudian period, see, Keenan-Jones 2015, 192–196, as well as on attempts to ascribe different dating to the extant water towers: Keenan-Jones 2015, 196, referring to the earlier observations on this issue made by Larsen 1982 and Heres 1992.

¹⁴¹ When R. Olsson (2024, 387–389) presented the addresses of houses with known water connections by *regio*, it resulted that Regio 8 has only six connected houses (as compared to about 25 in Regiones 6 and 7 respectively). This surprising difference applying to houses of similar kind and situation—large dwellings bridging the old city rampart—may reflect a wish to avoid damaging the mosaics, hallmarks of Regio 8, generally held to belong in the Late Republican to Early Augustan period. For a recent account of the *status quo* in research of the dating of these houses and their tessellated entrances: Kärfeve 2022, 131–132, 146, 292.

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