Reviving Antiquity with Granite: Spolia and the Development of Roman Renaissance Architecture

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Since being imported by ancient emperors, granite columns have been a pervasive element in the architecture of Rome. They adorned ancient baths and porticos, lined the naves of early-Christian basilicas, and were reused throughout the Middle Ages. However, in the second half of the fifteenth century, just as the effort to revive Antiquity intensified, these ubiquitous and durable ancient columns played only a minor role in that revival. It was instead the local, more workable stone travertine that became the columnar material of choice. Yet, just as quickly as this change had occurred, Roman builders once again turned to an interest in hard ancient granite columns. Within an exceptionally short period of thirty years, starting with the construction of the Palazzo della Cancelleria courtyard in 1496, Rome saw a renascence in their application. Little has been made of this material shift since formal innovations tied to the revival of Antiquity have often taken scholarly precedence over questions of materiality and reuse. But rather than simply being an afterthought of that revival, the sudden extensive employment of large granite columns was a crucial component in the recovery of a distinctly local Roman Antiquity. It signalled a new mode of architectural revival in Rome, in which spoliation displaced imitation with ancient granite columns being appropriated, not just to renew Antiquity, but to physically resubstantiate it.

GRANITE AND ROME

In the classical world, granite was highly valued by the Romans, who, after the establishment of the Empire, extensively exploited it for monolithic columns.[1] Through a system of imperial quarries, Egyptian grey and red granite, and to lesser extent granite quarried in Turkey and on the islands of Elba and Giglio, became an integral part of the Roman language of monumental architecture.[2] The predominant use of large granite columns in Rome, where they were erected by the thousands and adorned some of city's most

spectacular buildings, including the Pantheon, the Forum of Trajan and the Baths of Caracalla and of Diocletian, made them a hallmark of the imperial capital.[3] Yet as the Roman marble industry declined in the third century CE, the quarrying of hard stones largely ceased.[4] Consequently, builders in Rome from late Antiquity onward came to reuse ancient granite columns for the construction of new buildings, a practice generally known since at least the early sixteenth century as spoliation.[5]

That these architectural elements continued to be reutilised was not just a product of their ubiquity but also their durability. Egyptian granite was especially hard and resilient, and like other stones, once quarried, became even harder with time through a process known as case-hardening.[6] As Giorgio Vasari observed in the sixteenth century, not only was granite in the quarry 'far softer and easier to work than after it has lain exposed', but ancient granite columns due to their 'hardness and solidity have nothing to fear from fire or sword, and time itself, that drives everything to ruin, not only has not destroyed them but has not even altered their colour'.[7] Granite, like porphyry, could only be carved through the use of special tempered chisels and with great effort. This method of hardening steel, which involved quenching red-hot metal and then tempering it, made tools strong enough to work even the hardest of stones.[8] Yet this process, developed in Antiquity, was largely lost during the Middle Ages. In medieval Rome, therefore, all that could be done to adapt granite columns was to shorten them or slice them into discs (like those found in Cosmatesque pavements) by means of saws and emery.[9]

Despite this architectural limitation, granite columns were continuously reused throughout the medieval period, including in many early Roman churches such as St Peter's, S. Stefano Rotondo and S. Lorenzo fuori le Mura. In fact, over the course of the Middle Ages, the use of ancient granite columns became increasing prevalent and more churches, including S. Maria in Domnica, S. Prassede, S. Crisogono, S. Maria in Trastevere and SS. Quattro Coronati, exclusively employed columns of this type.[10] It was only in the later fifteenth century, just as the architectural revival of Antiquity gripped the city, that these columns fell out of favour. It was instead the travertine that became the material of choice for columnar architecture.

TRAVERTINE AND FIFTEENTH-CENTURY ROMAN ARCHITECTURE

The historiography of Roman *Quattrocento* architecture has often emphasised the emergence of a Renaissance aesthetic born out of both imported precedents and local ancient exempla. Yet this new Roman architecture was distinguished by not only its formal characteristics but also its material innovation, that is, its widespread embrace of travertine as a primary building material. Travertine, a white coloured sedimentary stone quarried in nearby Tivoli, had been a critical feature of the architecture of Republican and early Imperial Rome, being used most famously for the exterior of the Colosseum.[11] Medieval Roman builders, however, rarely employed this stone as the principal material for monumental architecture, as brick and small blocks of tuff known as *tuffelli* often replaced large-scale ashlar construction.[12] Nor did these same builders turn to travertine for columns, preferring instead spoliated marble and granite monoliths. While travertine remained in limited use in medieval Rome – it was employed in foundations and also

burned for lime – it never became the preferred mural or columnar material, despite its availability.

It was only in the second half of the fifteenth century, with the consolidation of papal authority, an increase in architectural production and a renewed interest in the revival of Antiquity, that travertine re-emerged as a dominant Roman building material. As most, if not all, travertine employed during this period came directly from the monuments of Antiquity themselves – the Lombard contractor Giovanni Foglia, for example, transported over 2,500 cartloads of the stone from the Colosseum in just nine months during 1452 – travertine was intrinsically linked to the architecture of ancient Rome.[13] Building with travertine also literally meant building in the manner of the ancients with ashlar masonry. This not only required greater labour and resources but also skilled masons competent in squaring blocks of stone. In a city where the walls and façades of even the largest Christian basilicas were built primarily of brick, the use of travertine was a momentous shift, one that humanists even explicitly compared to the architectural achievements of Augustus.[14]

The new-found importance of travertine is most evident in its conspicuous display in large palace and church façades, the latter including S. Maria del Popolo (begun 1472), S. Agostino (begun 1479) and S. Pietro in Montorio (begun 1483).[15] Its mutability also allowed architects of the period to go beyond basic mural construction and recreate countless antique-inspired forms, including *all'antica* round free-standing columns. Yet despite this potential, during the second half of the fifteenth century, Roman builders infrequently built with this type of column.[16] Rather, in many cases, they utilised octagonal columns constructed from multiple pieces of travertine, as in the exterior porticos of S. Pietro in Vincoli and SS. Apostoli (both begun *c*. 1475), the cloisters of S. Giovanni dei Genovesi (begun 1482; Fig. 1) and S. Cosimato (*c*. 1475), the courtyards of the Palazzetto of Palazzo Venezia (begun 1466; Fig. 2), Palazzo Nardini (begun *c*. 1473), Palazzo Domenico della Rovere (begun 1480s) and Palazzo Cesi (*c*. 1490s) and also the Cortile del Maresciallo at the Vatican (*c*. 1471).[17]

The dominance of this distinctive non-monolithic 'medieval' column from the 1460s through to the 1490s in Rome appears as an aberration in the history of Renaissance architecture since it took hold just as the classically proportioned, cylindrical, monolithic column with entasis became ubiquitous throughout Italy.[18] Scholars, consequently, have often cast these columns as a provincial holdover or an economical solution.[19] Yet this ignores the fact they were also an essential component of a new architectural mode, one that was literally derived from the travertine-clad buildings of Antiquity. When travertine gained prominence in later fifteenth-century Rome, the octagonal brick colonnade, as seen at the cloister of S. Maria Nova (*c*. 1450; Fig. 3), the now-destroyed Palazzo Apostolico adjacent to S. Maria Maggiore (finished before 1452) and the heavily modified courtyard of the Palazzo Sforza-Cesarini (1458–62), simply underwent a transformation to travertine.[20] It was the material of these columns rather than their form that evoked Antiquity.

At the same time, there were already attempts in fifteenth-century Rome to unite ancient form and material in a new mode of revival. The Benediction Loggia of S. Marco and the unfinished courtyard of the Palazzo S. Marco, both constructed under the aegis of Pope Paul II as part of the Palazzo Venezia complex during the

Fig. 1. *Rome, S. Giovanni dei Genovesi: cloister*

Fig. 2. *Rome, Palazzo Venezia: Palazzetto courtyard*

Fig. 3. *Rome, S. Maria Nova: cloister*

second half of the 1460s, are early examples of this. Here, builders took travertine from the Colosseum – a fact noted in construction documents and later by authors such as Paolo Giovio, Giorgio Vasari and Alfonso Chacón – and transformed it through re-carving into compositions reminiscent of the Colosseum itself (Fig. 4).[21] This literal renewal of Antiquity, through the direct appropriation of ancient architectural form and its associated material *in tandem*, signalled a shift in the dynamics of revival in Renaissance Rome. It acknowledged that ancient materials, such as travertine, were tied to specific ancient forms, and also inaugurated a mode of revival I will term *resubstantiation* in which architects attempted to recover ancient architecture through the use of spolia and the joining of ancient form, material and technique.

This phenomenon, I propose, eventually led to the reassessment of the column in late fifteenth-century Rome. When the builders of the Palazzo S. Marco determined that travertine from the Colosseum should assume the form of that ancient monument, they

Fig. 4. *Rome, Palazzo Venezia: courtyard*

abandoned the nearly contemporaneous courtyard model of the adjacent Palazzetto with its freestanding octagonal and round travertine columns (Fig. 2). This may suggest that travertine was no longer considered the most appropriate material for freestanding columns, that unlike the engaged column and arch, it did not have a strong ancient precedent. While the ancient Romans sometimes made freestanding columns from travertine, as seen in the Temple of Portunus, the Temple of Vesta at Tivoli and the temples at S. Nicola in Carcere and Largo Argentina, this practice largely ceased after the establishment of the Empire. By the fifteenth century, moreover, ancient travertine columns had mostly vanished, having been replaced with columns of coloured

marble by later emperors, succumbed to the ravages of time, incorporated in later buildings or burned for lime.

The image of columnar Antiquity in Renaissance Rome was instead dominated by visions of monolithic columns carved of ancient hard stones such as granite and their spoliated medieval successors. It was this image that was manifested in numerous frescoes of fictive multi-coloured, veined columns painted in Rome from the 1470s onward.[22] It was also reiterated in the writings of humanists, who often highlighted porphyry, serpentine and granite columns in their descriptions of Rome. So pervasive was this view of ancient Rome that the author of the *Antiquarie prospetiche Romane*, a poem written in the late 1490s by an anonymous Milanese painter, augmented a brief description of the travertine-clad Colosseum by describing in detail an even grander imaginary circular building ringed with columns of porphyry, serpentine and alabaster.[23]

Ancient columns in late fifteenth-century Rome were defined not just by their formal characteristics, such as their cylindrical shafts or ornamented capitals, but equally by their material and the monolithic nature of that material. In order truly to revive the columnar architecture of Antiquity, architects had to resurrect the ancient column not just formally but also materially. While travertine was a workable, easily accessible substitute, it lacked the associative power inherent in ancient monoliths. Consequently, the process of formal *imitatio*, critical to the development of Renaissance architecture, came up against a limitation in Rome where awareness of the corporeal qualities of ancient columns remained strong. As the effort to resubstantiate ancient architecture intensified, it was only spoliated columns that could truly embody the authority of ancient columnar architecture.

THE GRANITE COLUMNS OF THE PALAZZO DELLA CANCELLERIA

Spoliated columns, as Georg Satzinger has outlined, were not completely absent from fifteenth-century Roman architecture.[24] Nicholas V in the early 1450s, for instance, transported two, or possibly four, forty-foot monolithic columns from the Baths of Agrippa behind the Pantheon to St Peter's for use in a triumphal arch at the western end of the nave. At the end of the century, Innocent VIII and his successor Alexander VI matched this feat by employing a pair of giant granite monoliths in the triumphal arch at the Lateran basilica.[25] However, unlike these exceptional cases, columnar spolia in fifteenth-century Rome was generally less monumental and often heterogeneous.

Because significantly reshaping hardened granite shafts with chisels was so difficult, builders often simply shortened them with saws, as at the Palazzo Vitelleschi (*c.* 1436–40), built in Tarquinia using spolia from Rome and Ostia.[26] In other examples, these fragments were awkwardly retrofitted with travertine or marble necks, as in the cloister of S. Onofrio (*c.* 1434–44) and the courtyard of the Palazzo dei Conservatori (rebuilt *c.* 1451–53; Fig. 5).[27] In the case of the Ospedale di S. Spirito, refounded by Pope Sixtus IV in 1474 and composed of two large courtyards, a number of irregularly shaped granite columns, interspersed among newly carved travertine shafts, were adapted by modifying the heights of their capitals (Fig. 6).[28] In a city where most new courtyards and cloisters were being built exclusively of travertine, the spoliated columns of the Ospedale – the most used in any extant fifteenth-century Roman building – present themselves as a

Fig. 5. *Rome, Palazzo dei Conservatori: courtyard*

conscious architectural choice, possibly an attempt to appropriate Antiquity more direct-
ly. Yet without the ability to easily re-carve ancient granite shafts, its builders had to
embrace the irregularity of the spolia and a consequent architectural aesthetic of variety.

This was the paradox of using spoliated granite columns in the fifteenth century.
While they spoke strongly of Antiquity, they were difficult to integrate into a unified
all'antica composition. The builders of the Benediction Loggia of Pius II (begun in
1460) may have attempted to overcome this limitation by setting ancient granite
columns in a composition modelled on the Colosseum and Tabularium.[29] Yet, as this
structure was destroyed in the early seventeenth century, it is impossible to know to
what degree these granite shafts were successfully incorporated. It was only at the

Fig. 6. *Ospedale di S. Spirito: Chiostro degli Orfani*

end of the century, with the construction of the Palazzo della Cancelleria, that such a feat would be unquestionably achieved and builders would unleash the full potential of spoliated granite columns through a process of re-carving.

Begun in 1489, the Palazzo della Cancelleria was built for Cardinal Raffaele Riario, the nephew of Pope Sixtus IV, who first came to Rome in 1471 and was subsequently, in 1483, given the *commendam* for the fourth-century church of S. Lorenzo in Damaso.[30] Soon afterwards, he took up residence in the attached titular palace and, in 1486, began to restore the early-Christian church.[31] In that same year, according to Stefano Infessura's *Diarium urbis Romae*, Riario won 22,000 ducats from gambling with Franceschetto Cibo, the son of Pope Innocent VIII, and Cardinal Jean Balue.[32] With this tremendous sum of money, Riario pledged to rebuild his palace.

The new palace dwarfed its predecessor, enveloping not only the previous one, but also the adjacent church, part of the Via dei Leutari and the adjoining house of Francesco Maffei.[33] Riario, to whom the first printed edition of Vitruvius (1486) was dedicated, was devoted to the revival of Antiquity. His new palace was to be the fullest expression of that revival, a fact noted by contemporary authors such as Raffaele Maffei and Paolo Cortesi.[34] One of the primary means by which the Cancelleria did this was through direct citation rather than lose *all'antica* imitation. The courtyard capitals of the *piano nobile*, for example, directly emulate ancient capitals with rosettes from the Baths of Diocletian and the Basilica Aemilia.[35] Likewise the *piano*

nobile windows of the façade almost exactly replicate those of the Porta dei Borsari in Verona. This method of revival also extended to the travertine façade as a whole, which attempted to revive the ancient technique of ashlar construction, described by Vitruvius as *opus isodomum*, by imitating the drafted masonry seen on the Tomb of Cecilia Metella and other structures including a Roman wall under the Cancelleria itself.[36] The builders of the façade also employed spoliated travertine.[37] Thus, like the courtyard of the Palazzo S. Marco, the Cancelleria's façade went beyond simple formal citation by attempting to articulate an ancient material in an appropriately ancient manner. It was in the courtyard of the palace, however, that this mode of resubstantiation reached its zenith.

By 1496, attention at the Cancelleria worksite had turned away from the façade and towards the decoration of its interior, the destruction of the old church of S. Lorenzo in Damaso and the construction of an imposing new courtyard in its place.[38] This courtyard is composed of a two-storey arcade with forty-four granite columns, plus eight granite L-shaped corner-piers – a staggering amount of spolia (Figs 7 and 8).[39] On 23 November 1496, Riario made the first payments for the excavation and transportation of granite columns from *terminj*, the area of the Baths of Diocletian, to the Cancelleria construction yard. These columns, procured by Bernardino *ingegnerj*, are described in the payment records as '*rochj di cholonne di granito per fare li pilastrj*' – columns of granite specifically for the creation of the corner-piers.[40] Based on the width of the Cancelleria's lower corner-piers, these column shafts must have measured at least 1.4 m in diameter, making them similar in size to the monumental columns still *in situ* in the frigidarium of the Baths.[41] Additional records confirm that several large carts were purchased in 1497 for the transportation of these and other columns.[42]

The choice to build with ancient granite columns at the Palazzo della Cancelleria was a momentous one, making it the first courtyard of the Roman Renaissance to be built completely of spoliated granite monoliths. This decision first required the builders to procure these columns, a laborious and expensive feat that necessitated excavation and the use of impressive lifting machines.[43] But even once transported, hard granite shafts, often of varying proportions and dimensions, still presented the problem of integration. The Palazzo della Cancelleria changed this. Whereas spoliated granite columns had previously been used largely unaltered or simply shortened, the builders of the Cancelleria re-carved forty-four granite shafts into a matching set.[44] They also transformed enormous cylindrical columns into eight L-shaped piers. This meant carving away half of these ancient granite shafts, completely altering their original form (Figs 9 and 10). To do all this, the builders looked specifically to Florence for tempered chisels that were hard enough to work ancient granite. Between 15 March 1497 and 7 November 1503, fourteen payments were recorded from the Cancelleria *fabbrica to* a blacksmith from Tuscany named 'maestro Bernardino'.[45] The first three of these documents record the acquisition of nineteen chisels (*scharpelli*) specifically for the carving of the granite columns (*le cholonne di granito*), while the majority of the later transactions concern the mending, re-forging and re-tempering of these chisels.[46]

It is unknown precisely why the *fabbrica* sought chisels from Florence, but, since all other tools were acquired from local Roman blacksmiths, the obvious answer is that the necessary tempered chisels were not available in Rome. Suzanne Butters has
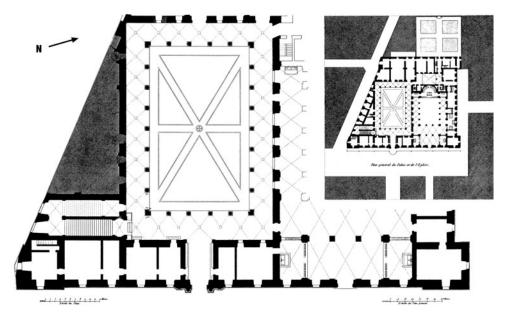
Fig. 7. *Rome, Palazzo della Cancelleria: plan (after Letarouilly)*

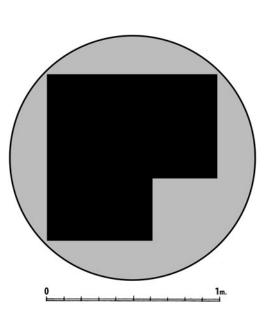Fig. 8. *Rome, Palazzo della Cancelleria: courtyard*

Fig. 10. *Diagram illustrating how the L-shaped corner-piers of the ground storey were re-carved from ancient granite columns (after Bentivoglio)*

Fig. 9. *Rome, Palazzo della Cancelleria: north-west corner-pier of courtyard's ground storey*

noted that Florentine artists and architects, such as Alberti, Verrocchio and Giuliano da Sangallo, were already experimenting with tempering in the fifteenth century, and some, such as Donatello, may have had experience of carving granite.[47] Florence, therefore, may have been the closest city where tempered chisels of sufficient hardness were being produced. Since there is no evidence of ancient granite columns being extensively re-carved in Rome before 1497, it is likely the requisite building technology simply did not exist there before the building of the Cancelleria. The importation of these chisels thus represents a technological shift that had a direct impact on architectural production.

The innate hardness of granite alone made the re-carving of granite columns a significant act. In the Renaissance, hardness along with colour defined stones and was the means by which Vasari and others catalogued and valued them. The elemental hardness of granite thus imbued it with intrinsic value in a culture that appreciated this aspect of materials. Fioravante Martinelli, for example, wrote in the seventeenth century that the granite columns of Old St Peter's should be venerated because their 'material has

something of the eternal about it'.[48] This hardness also imparted supposedly magical properties to the stone. As the humanist Angelo Decembrio wrote in the 1450s of the granite Vatican obelisk:

> Even though people see the stone [granite] resisting iron chisels, not only in colour but also in its substance, and sparks bouncing off it, they still cut off little rinds, which they repeatedly smell and weigh in their hands, and finally they babble about how the work was carried out not by human power but by necromancy or magical arts.[49]

The immutability of granite in this way gave it meaning. The lost ability to carve granite columns thus represented much more than just the superiority of ancient technology: the material itself and its physical permanence embodied Antiquity's mysterious omnipotence.

The ability to reshape these granite columns would have been understood by contemporaries as equalling the achievements of the ancients. To those who still believed the impenetrable material held magical power, a belief that must have been heighted by its association with ancient Egyptian obelisks, transforming these relics must have been all the more extraordinary. Like transporting ancient granite monoliths, reworking these columns with tempered chisels was itself an act of revival. This was a laborious process in which granite was slowly chipped away with a pointed chisel, before being shaped with a toothed chisel and eventually brought to a polish with the use of emery.[50] Contemporary viewers understood the difficulty of this undertaking. Master Gregory, in his early thirteenth-century *Mirabilia urbis Romae*, for example, wrote that a local cardinal claimed a single granite column from the Baths of Diocletian 'could scarcely have been cut, polished and finished by a hundred men in the space of a year'.[51] It was the physical process of carving granite and knowledge of that process, as much as the end product, that held value.[52]

It was through the use of tempered chisels that the builders of the Cancelleria were able to unleash the potential of these ancient architectural remnants – specifically, re-carving transformed granite columns of varying sizes into a matching set that could be seamlessly integrated in the palace's two-storey courtyard. But, just as importantly, tempered chisels enabled workmen to make broken ancient columns whole again. This process breathed new life into ancient columnar fragments that had previously stood only for the demise of Antiquity and the passage of time. No longer did they signify ancient ruin, but once again they evoked ancient splendour. These courtyard columns, which remained identifiably ancient by virtue of their material, were thus proof that Antiquity had been literally renewed, revived and physically reborn. Spoliation in this way was not destructive but regenerative.

The L-shaped corner-piers of the Cancelleria courtyard further exemplify this mode of revival. Carved from several large columns, most likely fragments, from the Baths of Diocletian (and possibly elsewhere), the transformation of round shafts into angular piers is curious as this type of pier has little ancient precedent.[53] Yet in the late fifteenth century, based partly on Vitruvius's suggestion that corner-supports should be wider to bear the thrust of arches, the L-shaped pier became a distinctly ancient element used in Roman peristyles, as illustrated by Francesco di Giorgio in the first version of his architectural treatise and Fra Giocondo in his 1511 edition of
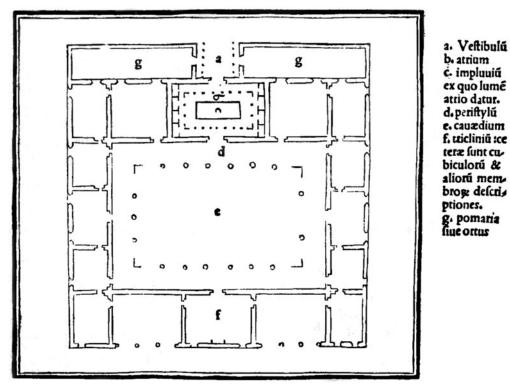
a. Vestibulū
b. atrium
c. impluuiū
ex quo lumē
atrio datur.
d. periftylū
e. cauædium
f. tricliniū :ce
teræ funt cu-
biculorū &
aliorū mem-
broȳ defcri-
ptiones.
g. pomaria
fiue ortus

Fig. 11. *Plan of a 'modest house' according to Fra Giocondo (*M. Vitruvius*, Venice, 1511, fol. 63 r)*

Vitruvius (Fig. 11).[54] Architects at the same time also came to believe ancient Romans used this type of pier in the courtyard porticos (*xysti*) of imperial baths, as can be seen in contemporary reconstructions (Fig. 12).[55] Thus, the builders of the Cancelleria, by re-carving ancient cylindrical columns into L-shaped piers, were in part attempting to recreate an ancient peristyle. But more than that, they were transforming columns spoliated from the Baths of Diocletian into granite L-shaped piers of the kind they believed once adorned the very same complex. To make sure the reference was clear, they topped the courtyard columns with capitals derived from those also found in this same structure. The corner-piers could have easily been carved from travertine, as seen in contemporary palaces and cloisters, but a conscious choice was made at the Cancelleria to use granite, and thus go beyond a fifteenth-century mode of *imitatio* to resubstantiate ancient Roman architecture. Architects and patrons wanted these new architectural elements not just to reference Antiquity, but to *be* ancient both formally and materially. Since L-shaped piers no longer existed, they had to be recreated from the very ancient columns that they once stood beside.
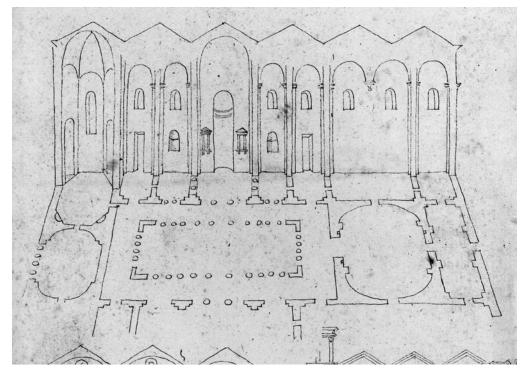
Fig. 12. *Anonymous (late fifteenth century), Baths of Diocletian (Florence, Uffizi, Gabinetto Disegni e Stampe, 1863 Ar)*

The Cancelleria courtyard thus represents a paradigm shift in Roman Renaissance architecture. Technologically, the importation of tempered chisels enabled builders once again to carve hard ancient granite, liberating the stone from its previous limitations and allowing architects to embrace it as the columnar material of choice. Early sixteenth-century Roman architecture has traditionally been understood as the product of a desire to replicate more faithfully, authentically and archeologically the architecture of Antiquity through the study of Vitruvius and the measured drawing of ruins. Yet with the increased interest in the direct appropriation of Antiquity also came issues of materiality. Just as Baldassare Peruzzi, in the ceiling of the Jerusalem Chapel at S. Croce in Gerusalemme (completed by 1509), attempted to revive the art of mosaic in an effort to imitate ancient art in an ancient medium, architects beginning with the Cancelleria utilised ancient granite columns to join ancient form and material and signify the building's ancient authenticity.[56] As the desire to resubstantiate ancient architecture grew stronger, it became necessary to employ ancient granite monoliths rather than simply replicating their formal characteristics. It was only spolia that could embody the materiality of ancient columnar architecture – only ancient columns could stand for ancient columns in this new architectural mode.

BRAMANTE AND SPOLIATED GRANITE COLUMNS

Donato Bramante, credited by Andrea Palladio with bringing to light the 'good and beautiful architecture of the ancients', arrived in Rome at the end of 1499.[57] According to Vasari, he almost immediately began studying 'all the ancient buildings', and was consulted on the Palazzo della Cancelleria, which was still under construction.[58] Regardless of the validity of these remarks, the architect undoubtedly gained an early familiarity with the city's ancient ruins and its most notable new building. As is evident in his Roman work, including the famous Tempietto of S. Pietro in Montorio (Fig. 13), Bramante fully embraced the architecture of Antiquity, and like the builders of the Cancelleria, he sought to resubstantiate it through the exploitation of spoliated granite columns.

Begun as early as 1502, Bramante's Tempietto is a round peripteral temple, composed of sixteen spoliated granite columns surmounted by a Doric frieze, drum and dome, built to mark the site of St Peter's martyrdom.[59] Its formal characteristics have led historians to trumpet the building as the advent of a new 'classical' Renaissance architecture which, according to Wolfgang Lotz, came closer to the 'essential nature of ancient architecture' than anything before.[60] It is difficult to deny that the Tempietto derived much of its ancient authority from its formal qualities; yet the granite columns themselves would also have spoken strongly of Antiquity to contemporaries. Even Palladio, in his short three-sentence description of the structure in the *Quattro libri*, mentions that the columns are granite.[61] While it is unknown if their relatively slender shafts, measuring 3.1 m in height, were purposefully re-carved, the use of three different types of granite suggests this is likely.[62] What is clear is that the proportions of the building as a whole correspond to those of the columns.[63] The granite shafts of the Tempietto were thus fundamental to its design. While they visually stand apart from the rest of the structure, much of which is made of travertine, they are fully integrated into its classical composition.

The columns, as identifiably ancient elements, may have also been understood by contemporaries, like the form of the building as a whole, as pagan features re-consecrated to serve a new Christian function.[64] Their spoliation and architectural subjugation could thus serve to demonstrate Christianity's continual triumph over paganism. They also link the Tempietto to the granite column-lined, circular churches of S. Costanza and S. Stefano Rotondo, both of which were believed in the Renaissance to be re-consecrated ancient temples.[65] In this way the Tempietto's spoliated columns were critical to the building's ancient aura. As much as the building's form, they linked the Tempietto physically back to the time of St Peter's crucifixion and the re-sanctified architecture of Antiquity.

Bramante's use of ancient granite columns continued in his subsequent work for Pope Julius II. They adorn, for example, the *serliane* of his S. Maria del Popolo tribune (*c.* 1506), the Sala Regia in the Vatican Palace (*c.* 1507) and the spiral staircase of the Cortile del Belvedere (begun around 1507). This final structure, which was part of an ambitious series of projects envisioned by the pope and Bramante for the Vatican, has an outer ramp that makes four revolutions around a central void (Figs 14 and 15).[66] As the ramp spirals upward, the columns that support its inner edge transform from short

Fig. 13. *Rome, Tempietto di S. Pietro in Montorio*

stocky Tuscan to slightly more ornate slender Doric, to slimmer voluted Ionic and finally to an even more attenuated and decorated Corinthian/Composite. The shafts of the first thirty-one columns are granite, while the originally last, uppermost column is of grey marble.[67]

What is astonishing is that each granite shaft reduces in diameter by less than a centimetre from its predecessor, diminishing from 50 cm at the bottom to 31 cm at the top.[68] While numerous scholars have written extensively on the progression of the orders and the proportions of the columns, they have largely ignored the exceptional nature of this continuous diminution.[69] The amount of work it took to reshape thirty-one granite columns to such stringent dimensional requirements must have been extraordinary. With all of the ambitious construction projects of Julius II, including the construction of the Cortile del Belvedere and the rebuilding of St Peter's, it is all the more remarkable that so much effort was dedicated to something few people would see, since the sole purpose of the staircase was to provide access for the most privileged to the papal collection of antiquities above.

The spiral staircase plays to this elite audience who viewed staircases as important sites of courtly display. It is a work of bravura, designed to envelop the visitor in an architectural progression marked by pieces of Antiquity in the form of ancient granite columns on the left and ancient statues set in niches on the right, culminating in the famous sculpture court above. In this case, the ancient proportions of the spoliated columns were expendable; the whole concept of columnar proportion was secondary. The emphasis of the spiral staircase was instead on the hard ancient granite shafts and their seemingly miraculous transformation into a series of gradually diminishing classical columns as one ascended. In this way, Bramante made it manifestly clear that these columns had been re-carved. Yet instead of alluding to the slow, difficult process required to reshape them, in an almost cinematic fashion, the staircase makes this performance look effortless, like an architectural embodiment of *sprezzatura.* Such transformations and subversions, although largely overlooked today, would have resonated with the stairway's elite viewing audience, who appreciated the nature of materials and were cognisant about their standard contemporary use. The spiralling transformation of one of the hardest of ancient stones would thus have been understood as a Herculean achievement worthy of the ancients. It also made the spiral staircase an integral component of the antique programme of the Belvedere as a whole, while giving almost literal credence to Sebastiano Serlio's statement that Bramante had 'brought back to life the architecture of Antiquity that had lain buried'.[70]

THE TRIUMPH OF GRANITE

A final testament to the power and popularity of granite before the Sack of Rome in 1527 is a series of palaces built by a variety of patrons and architects. These buildings – Palazzo Lante-Medici, Palazzo Cardelli (now Palazzo di Firenze), Palazzo Sangallo in via Giulia, Palazzo Regis ai Baullari, Palazzo Ossoli, Palazzo della Valle and Palazzo Farnese – are a diverse group varying in size as well as arrangement, yet they all exploit spoliated granite columns.[71] Together they confirm the tremendous architectural shift that occurred in the city of Rome in the wake of the Palazzo della Cancelleria.
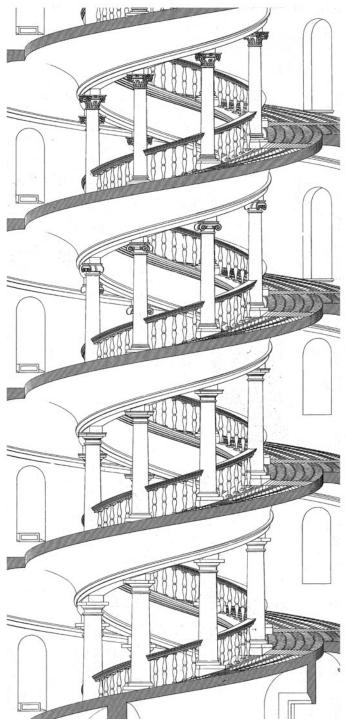
Fig. 14. *Rome, Belvedere staircase: cross-section (after Letarouilly)*

Fig. 15. *Rome, Belvedere staircase*

Granite had once again become a critical component of Roman architecture. Through the use of ancient monolithic granite columns, each of these palaces attempted to insert itself into the forefront of the city's architectural development.

Fig. 16. *Rome, Casa dei Fabi
(via Portico d'Ottavia, 13):
courtyard*

Some of these buildings also kept pace with the current architectural climate by providing their smaller courtyards with the same kinds of features found in the most grandiose palace to date. For example, when Andrea della Valle enlarged his family palace between 1507 and 1517, he built a new courtyard on the model of Palazzo della Cancelleria. While the L-shaped corner piers of this structure were made of travertine, he attempted to equal the Cancelleria by adorning its courtyard with spoliated marble and granite column shafts, topped with marble capitals, and accompanied by roundels made of the ancient stones porphyry, *verde antico* and *africano*, and ancient statuary set in niches. Spoliated granite, like ancient sculpture, was also an indicator of wealth and social status, as well as a commodity to be bought, sold and displayed. The papal banker Agostino Chigi, for example, spent the extravagant sum of 300 *scudi* on a monolithic granite step for his new chapel in S. Maria del Popolo (begun 1513).[72] Even small residences, such as
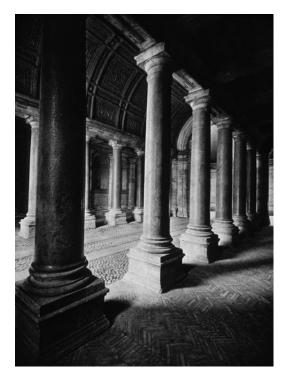
Fig. 17. *Rome, Palazzo Farnese: vestibule*

Fig. 18. *Rome, Palazzo Borghese: courtyard*

the Casa dei Fabi at the Porticus of Octavia (Fig. 16), employed granite columns, presumably to demonstrate the family's social standing and ancient heritage.[73]

Arguably the greatest example of this phenomenon is the Palazzo Farnese. Cardinal Alessandro Farnese, who obtained an earlier cardinal's palace in 1495, began to rebuild this residence in the mid-1510s. Under his aegis, Antonio da Sangallo the Younger designed a monumental palace with an entry vestibule flanked with twelve alternating red and grey granite columns that were in place by the early 1520s (Fig. 17).[74] In its form, this space emulates the column-lined *vestibulum* of an ancient house, as described by Vitruvius and illustrated by Fra Giocondo in 1511 (Fig. 11). Yet materially, the architect and patron chose granite columns to support the classically-inspired barrel vault.[75] Like the Belvedere staircase, the visitor would thus enter into a space defined by ancient granite columns and statuary set in niches that established the tone of the classically inspired whole. It is not accidental that the Florentine Fra Mariano specifically mentioned these 'beautiful columns' in his 1518 description of ancient and modern Rome.[76] For sixteenth-century viewers entering the vestibule, it was the spoliated granite columns themselves, coupled with the formal language of classicism, that gave the impression that Antiquity had been revived.

After the Sack of Rome in 1527, the use of ancient granite columns in new construction continued, but their popularity waned. Nonetheless, as the century came to a close, granite columns remained potent bearers of meaning, adorning the courtyard of Rome's last great Renaissance palace – the Palazzo Borghese. Built between 1572 and 1612, the palace's courtyard is lined with ninety-six paired columns, almost all of which are granite (Fig. 18).[77] Not since the Palazzo della Cancelleria had Rome seen a structure with so many spoliated granite shafts. The courtyard of the Palazzo Borghese is thus a final witness to the enduring power of granite in the city of Rome through end of the sixteenth century.

Yet by the twentieth century this power had largely been obscured. As spoliation died out, mechanical technology emerged and a worldwide system of quarrying was established, knowledge of the means by which ancient granite columns were procured and transformed in Renaissance Rome was lost. With this disconnect from process, much of the original meaning of these columns slowly disappeared. At the same time, the material itself was progressively hidden under the universal grey patina of pollution. This problem was only compounded by the proliferation of monochrome prints and photographs of these buildings. Yet by returning to the monuments themselves and examining them in terms of their materiality, it is possible see how the architecture of revival was directly tied to the physical appropriation of Antiquity in Rome. Through the use and transformation of spolia, specifically ancient granite columns, builders and patrons attempted to create an architecture that not only recalled Antiquity, but resubstantiated it, literally making it whole again. In this way, it authenticated the idea that the architecture of ancient Rome had actually been brought back to life and renewed. Spoliated granite columns were a physical proof of this rebirth.

BIOGRAPHY

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ABSTRACT

Ancient granite columns have been a pervasive element in the architecture of Rome since the Imperial era. However, in the fifteenth century, just as the effort to revive Antiquity intensified, these ubiquitous and durable ancient columns fell out of use. It was instead the stone travertine that became the columnar material of choice. Yet, just as quickly as this change occurred, within an exceptionally short period of thirty years, beginning with the construction of the Palazzo della Cancelleria courtyard, Rome saw a renascence in their application. While little has been made of this material shift, this article argues that the sudden extensive employment of spoliated granite columns was a crucial component in the recovery of a distinctly local Roman Antiquity. It was through the use and transformation of spolia that builders and patrons attempted to create an architecture that not only recalled Antiquity, but resubstantiated it, literally making it whole again.

NOTES

1 The word 'granite' derives from the Latin *granum*, meaning grain, and refers to the stone's granular appearance. The ancient Romans classified all stones that could take a polish as marble (*marmor*). More specifically, granite from Mons Claudianus was known as *marmor claudianum,* although red Aswan granite was referred to by its Greek name *lithos/lapis pyrrhopoecilos.* The Italian word *granito* only came into widespread use in the fifteenth century; see Raniero Gnoli, *Marmora romana*, 2nd edn (Rome, 1988), pp. 145–46.

2 Three types of Egyptian granite were widely exploited by the Romans: *granito del foro* from the Mons Claudianus in remote eastern Egypt, *granito bigio* from Syene (modern day Aswan) and *granito rosso* also from Syene. The use of Mons Claudianus grey granite was confined almost exclusively in Rome itself, suggesting it was part of an imperial monopoly; see David P.S. Peacock, Olwen Williams-Thorpe, R.S. Thorpe and A.G. Tindle, 'Characterisation Studies and the Use of Mons Claudianus Granodiorite', in *Mons Claudianus: Survey and Excavation, 1987–1993,* ed. David P.S. Peacock and Valerie A. Maxfield, 4 vols (Le Caire, 1997), I *Topography and Quarries,* pp. 315–37 (pp. 333–34); and Rosemarie Klemm and Dietrich D. Klemm, *Stones and Quarries in Ancient Egypt* (London, 2008), pp. 233–67, 280–90. On ancient granite in general, see Giorgio Vasari, *Le vite de' più eccellenti pittori scultori ed architettori,* ed. Gaetano Milanesi, 9 vols (Florence, 1878–85), I, pp. 115–17; Agostino del Riccio, *Istoria delle pietre*, ed. Paola Barocchi (Florence, 1979), pp. 90–94; Gnoli, *Marmora romana*, pp. 145–61; G. Galetti, L. Lazzarini and M. Maggetti, 'A First Characterization of the Most Important Granites Used in Antiquity', in *Ancient Stones: Quarrying, Trade and Provenance,* ed. Marc Waelkens and others (Leuven, 1992), pp. 167–73; Olwen Williams-Thorpe, 'A Thousand and One Columns: Observations on the Roman Granite Trade in the Mediterranean Area', *Oxford Journal of Archaeology*, 27, no. 1 (2008), pp. 73–89.

3   According to Corsi's 1833 catalogue of over 6000 still-standing ancient columns in Rome, well over half are granite; see Faustino Corsi, *Delle pietre antiche*, 2nd edn (Rome, 1833), pp. 293–385.

4   On the decline of the Roman marble industry, see Marc Waelkens, 'Marble', in *Late Antiquity: A Guide to the Postclassical World*, ed. G.W. Bowersock and others (Cambridge, 1999), pp. 559–62. In the Middle Ages and the Renaissance, granite continued to be quarried to a limited extent at a Roman quarries on Elba and Giglio as well as in alpine northern Italy, but there is no evidence that this stone ever made its way to Rome; see Francesco Rodolico, *Le pietre delle città d'Italia* (Florence, 1953), pp. 355–81. On quarrying in the medieval period, see Michael Greenhalgh, *Marble Past, Monumental Present: Building with Antiquities in the Mediaeval Mediterranean* (Leiden, 2009), pp. 89–140.

5   For an overview of the vast literature on spolia, see Dale Kinney, 'The Concept of *Spolia*', in *A Companion to Medieval Art: Romanesque and Gothic in Northern Europe*, ed. Conrad Rudolph (Oxford, 2008), pp. 239–49.

6   Egyptian red and grey granite measure seven on the Mohs scale, making it harder than many other types of granite, but softer than porphyry and emery. In general, stone when first quarried contains moisture known as quarry-sap. As this moisture is drawn out, in a process known as seasoning, the stone becomes harder. At the same time, as the moisture leaves the stone, salts and other minerals are deposited on the surface creating a hard outer shell, known as case-hardening. With granite, which is denser than most stones and therefore contains significantly less moisture, case-hardening is caused primarily by chemical reactions that occur between the outer surface of the stone and the air; see Ira Osborn Baker, *A Treatise on Masonry Construction*, 9th edn (New York, 1905), p. 18; John Ashurst and Francis G. Dimes, *Conservation of Building and Decorative Stone* (Oxford, 1998), p. 33.

7   Giorgio Vasari, *Vasari on Technique,* ed. G. Baldwin Brown, trans. Louisa S. Maclehose (New York, 1960), pp. 40–41; Vasari, *Le vite*, I, pp. 116–17: '*E vedesi che nella cava, quando si taglia, è più tenero assai che quando è stato cavato, e che vi si lavora con più facilità […] Che per la durezza e saldezza loro non hanno temuto fuoco nè ferro, et il tempo istesso che tutte le cose caccia a terra, non solamente non le ha distrutte, ma neppur cangiato il colore*'.

8   On the history of tempering, see Suzanne B. Butters, *The Triumph of Vulcan: Sculptors' Tools, Porphyry and the Prince in Ducal Florence* (Florence, 1996).

9   Ibid., pp. 121, 172 and 290. Even today, granite remains a difficult material to work by hand with modern chisels. A beginners' handbook on sculpture for instance advises, 'I have known many fledgling who have given up sculpture […] because too early in their careers they ran afoul a piece of granite. I do not approve of granite as a medium for beginners': Louis Slobodkin, *Sculpture: Principles and Practice* (New York, 1973), p. 131. While granite continued to be quarried to some extent on Elba and Giglio and in the Dolomites, this softer granite fresh from the quarries, unlike its ancient Egyptian counterpart, probably did not necessitate the use of special tempered chisels. Nor does this type of stone seem to have been extensively exported. It was only at the end of the sixteenth century that large granite monoliths quarried on Giglio were exported to Naples for use in the Church of the Gerolamini.

10   According to a statistical study by Albert van Stekelenburg, the use of spoliated granite columns in Rome significantly increased over the course of the medieval period. Only 25% of the columns in extant churches built between the fourth and sixth centuries were made of granite, a proportion that increased in the seventh and eighth centuries to 61%, and by the twelfth and thirteenth centuries reached 69%; Albert V. Van Stekelenburg, 'Some Statistics Regarding the Spolia Columns in the Christian Basilicas of Rome', *Mededelingen van het Nederlands Instituut te Rome*, 51/52 (1992–93), pp. 114–21.

11   For an overview on the production and use of travertine in ancient Rome, see Marie Jackson and Fabrizio Marra, 'Roman Stone Masonry: Volcanic Foundations of the Ancient City', *American Journal of Archaeology,* 110 (2006), pp. 403–36.

12   J.E. Barclay Lloyd, 'Masonry Techniques in Medieval Rome, *c.* 1080–*c.* 1300', *Papers of the British School at Rome,* 53 (1985), pp. 225–77; Roberto Marta, *Tecnica costruttiva a Roma nel Medioevo* (Rome, 1989); Daniela Esposito, *Tecniche costruttive murarie medievali: murature 'a tufelli' in area romana* (Rome, 1998).

13   While there are records of stone being moved by means of barge for the construction of the tribune of Nicholas V at St Peter's, the type of stone and its origin is not specified. In the early sixteenth century, spurred by the construction of new St Peter's, Julius II opened a travertine quarry in Fiano Romano. Later, according to a *breve* issued in 1519, Leo X agreed to donate salt annually to the town of Tivoli in compensation for travertine extracted in its territory. Nevertheless, travertine continued to be spoliated throughout the sixteenth century as much of this newly quarried stone was burned for lime; see Eugène Müntz, 'Les monuments antiques de Rome au XVe siècle', *Révue archéologique,* 2, no. 32 (1876), pp. 158–75 (pp. 170 and 172); Ivana Ait and Manuel Vaquero Piñeiro, *Dai casali alla fabbrica di San Pietro: i Leni uomini d'affari del rinascimento* (Rome, 2000), pp. 176–90.

14 The humanists Giovanni Antonio Campano and Raffaelo Maffei, for example, both celebrated Sixtus IV for transforming a city of brick into stone, just like Augustus before him; see Egmont Lee, *Sixtus IV and Men of Letters* (Rome, 1978), pp. 123–24.

15 Additionally travertine was used for the interiors of S. Maria del Popolo and S. Giacomo degli Spagnoli (consecrated 1458). It also supplanted traditional stuccoed brick for the Palazzo della Cancelleria (façade completed *c.* 1496), Palazzo Castellesi-Giraud (façade completed *c.* 1504) and, to a lesser extent, for the Palazzo Santacroce (*c.* 1500).

16 The exceptions are the cloister of S. Pietro in Vincoli (begun 1484), the courtyard of the Palazzo della Rovere at SS. Apostoli (finished 1501) and the Palazzo Doria-Pamphilj (begun 1505). Cylindrical columns were also used above octagonal columns for the portico of SS. Apostoli and the Palazzetto of the Palazzo Venezia.

17 Octagonal columns can also been seen in the Castello della Crescenza north of the city and the Castello Orsini in Bracciano.

18 Octagonal columns, while most common in thirteenth- and fourteenth-century Tuscan architecture, were also used in a handful of early fifteenth-century Florentine structures. They are also found in some later buildings such as the Castel Nuovo and the Palazzo Carafa in Naples, the Palazzo delle Papesse and the cloisters of S. Domenico in Siena, the cloister of Spoleto Cathedral, Perugia Cathedral, Ascoli Piceno Cathedral, the Palazzo Apostolico in Bologna, the choir screen of S. Rocco in Vicenza, and S. Maria della Pace and the cloister of S. Maria del Gesù in Milan.

19 See for example Piero Tomei, *L'architettura a Roma nel Quattrocento* (Rome, 1942), pp. 156–57; Simonetta Valtieri, 'L'architettura a Roma nel XV secolo: l'Antico come 'imitazione' e come 'interpretazione' nel suo processo formative ed evolutivo', in *Roma, centro ideale della cultura nei secoli XV e XVI: da Martino V al Sacco di Roma, 1417–1527*, ed. Silvia Danesi Squarzina (Milan, 1989), pp. 257–68 (p. 261); Pier Nicola Pagliara, 'Costruire a Roma tra Quattrocento e Cinquecento: note su continuità ed innovazioni', in *Storia dell'architettura come storia delle tecniche costruttive: esperienze rinascimentali a confronto,* ed. Maurizio Ricci (Venice, 2007), pp. 25–73 (pp. 36 and 42); Arnaldo Bruschi, 'Le vicende della chiesa di San Pietro in Montorio e qualche nota sui problemi storiografici dell'architettura romana del Quattrocento', *Quaderni dell'Istituto di Storia dell'Architettura,* 51 (2008), pp. 17–34 (p. 26).

20 The octagonal columns of the Palazzo Sforza-Cesarini were originally brick but were replaced with travertine blocks in the nineteenth century; see Christoph L. Frommel, 'Il Palazzo Sforza Cesarini nel Rinascimento', in *Palazzo Sforza Cesarini,* ed. Lucia Calabrese (Rome, 2008), pp. 23–44 (p. 34). Brick octagonal columns continued to be used to a limited degree after the 1460s and are found in SS. Nereo ed Achilleo, the Chiostro dei Nobili of the Ospedale di S. Spirito, the cloister of S. Cosimato, the Palazzo Domenico della Rovere, the villa of La Magliana and the Villa Sinibaldi.

21 Five surviving construction documents dated between 1466 and 1467 explicitly note that travertine was procured from the Colosseum; see Giuseppe Zippel, 'Paolo II e l'arte: note e documenti', *L'arte,* 13 (1910), pp. 241–58 (p. 246); Rodolfo A. Lanciani, *Storia degli scavi di Roma e notizie intorno le collezioni romane di antichità,* 4 vols (Rome, 1902–13), I, p. 71; see also Paolo Giovio, *Historiarum,* in *Opera,* ed. Dante Visconti (Rome: 1957), p. 51; Vasari, *Le vite,* II, p. 472; Alfonso Chacón, *Vitae et gesta summorum pontificum* (1601), p. 961. On these two structures, see especially Christoph L. Frommel, *Der Palazzo Venezia in Rom* (Opladen, 1982), pp. 12–20; Christoph L. Frommel, 'Francesco del Borgo: architetto di Pio II e di Paolo II', in *Architettura e committenza da Alberti a Bramante* (Florence, 2006), pp. 79–313 (pp. 180–93, 247–57).

22 These include the Biblioteca Greca in the Vatican Palace (*c.* 1454), the Sala della Piattaia in the Palazzo Altemps (*c.* 1477), the Sala del Gran Maestro in the Palazzo di Domenico della Rovere (*c.* 1480s), the Chapel of Girolamo Basso della Rovere in S. Maria del Popolo (1488–90) and the Sala del Mappamondo in the Palazzo Venezia (before 1491).

23 *Antiquarie prospetiche romane*, ed. Giovanni Agosti and Dante Isella, (Parma, 2004), pp. 21–22. The description was partly inspired by Seutonius's description of Nero's *porticus triplices* and possibly similar fabulous descriptions in the *Hypnerotomachia Poliphili* (1499); see Maurizio Calvesi, 'Il mito di Roma e le "Antiquarie prospettiche"', *Storia dell'arte,* 113/114 (2006), pp. 55–76.

24 Georg Satzinger, 'Spolien in der römischen Architektur des Quattrocento', in *Antike Spolien in der Architektur des Mittelalters und der Renaissance,* ed. Joachim Poeschke (Munich, 1996), pp. 249–76.

25 Nikolaus Muffel, *Descrizione della città di Roma nel 1452: Della indulgenze e dei luoghi sacri di Roma (Der ablas und die heiligen stet zu Rom),* ed. Gerhard Wiedmann (Bologna, 1999), pp. 90–91; Georg Satzinger, 'Nikolaus V, Nikolaus Muffel und Bramante: monumentale Triumphbogens en in Alt- St.-Peter', *Römiches Jahrbuch der Bibliotheca Hertziana,* 31 (1996), pp. 91–106; Satzinger, 'Spolien', pp. 249–54; Lex Bosman, *The Power of Tradition: Spolia in the Architecture of St Peter's in the Vatican* (Hilversum, 2004), pp. 59–60.

26 On the Palazzo Vitelleschi, see John E. Law, 'Giovanni Vitelleschi: "prelato guerriero"', *Renaissance Studies,* 12, no. 1 (1998), pp. 40–66 (pp. 49–50); Georgia Clarke, *Roman House – Renaissance Palace: Inventing Antiquity in Fifteenth-Century Italy* (Cambridge, 2003), p. 200.

27 See Tomei, *L'architettura,* p. 42–45; Satzinger, 'Spolien', p. 251. The use of varying types of spoliated columns can also be seen in the Palazzo Mattei alle Tartarughe and the Chiostro della Cisterna at S. Maria sopra Minerva.

28 The Cortile dei Nobili has spoliated columns on the ground floor and squat, brick octagonal columns on the upper storey, while the Cortile dei Monache employs spoliated columns for both stories. With the exception of the corner piers, most of the travertine columns in both courtyards have been heavily restored; see Satzinger, 'Spolien', p. 256.

29 Beginning in 1461, workmen brought nine columns from the area of the Lateran and an additional eleven from the Portico of Octavia, all of which were presumably granite; see Lanciani, *Storia degli scavi,* I, pp. 67–70; Frommel, 'Francesco del Borgo', pp. 94–104; Satzinger, 'Spolien', p. 254.

30 Christoph L. Frommel, 'Il cardinale Raffaele Riario ed il palazzo della Cancelleria', in *Sisto IV e Giulio II, mecenati e promotori di cultura,* ed. S. Bottaro, A. Dagnino and G. Rotondi (Savona, 1989), pp. 73–85 (pp. 73–75). The titular palace attached to S. Lorenzo in Damaso had already been enlarged and improved by Giordano Orsini and Francesco Gonzaga in the fifteenth century; see Christoph L. Frommel, 'San Lorenzo in Damaso e l'attiguo palazzo cardinalizio tra il Quattrocento e il primo Cinquecento', in *L'antica basilica di San Lorenzo in Damaso: indagini archeologiche nel Palazzo della Cancelleria, 1988–1993,* ed. Christoph L. Frommel and Massimo Pentiricci, 2 vols (Rome, 2009), I, p. 411–30 (p. 421).

31 Valtieri suggests that three columns acquired for this project in 1486 are evidence that the church was not originally destined for demolition and that this is further supported by a new marble portal being built to the south of the left aisle in February 1486 and a tomb erected by Jacopo Gallo in 1488/89; see Simonetta Valtieri, 'La fabbrica del palazzo del cardinale Raffaele Riario (la Cancelleria)', *Quaderni dell'Istituto di Storia dell'Architettura,* 169–174 (1982), pp. 3–25 (p. 3); Frommel, 'San Lorenzo in Damaso', p. 422.

32 Stefano Infessura, *Diario della città di Roma di Stefano Infessura scribasenato,* ed. Oreste Tommasini (Rome, 1890), pp. 251–52.

33 Frommel, 'San Lorenzo in Damaso', p. 412.

34 Paolo Cortesi makes several mentions of the Riario's palace in his work *De cardinalatu* and used the Palazzo della Cancelleria as the model for his ideal cardinal's palace; see Kathleen Weil-Garris and John D'Amico, 'The Renaissance Cardinal's Ideal Palace: a Chapter from Cortesi's *De Cardinaltu*', *Memoirs of the American Academy in Rome,* 35 (1980), pp. 45–123; Cammy Brothers, 'Architecture, Texts, and Imitation in Late-Fifteenth- and Early-Sixteenth-Century Rome', in *Architecture and Language: Constructing Identity in European Architecture* c. *1000*-c. *1650,* ed. Georgia Clarke and Paul Crossley (Cambridge, 2000), pp. 82–101.

35 An example of this specific type of rosette capital remains today in the church of S. Prisca and similar capitals are also visible in the Museo Nazionale Romano Terme di Diocleziano. One from the Baths of Diocletian is illustrated in Roland Fréart de Chambray, *Parallèle de l'architecture antique et de la moderne* (Paris, 1650), p. 17.

36 On the rusticated ancient wall of tuff and travertine beneath the Cancelleria, see Martine Royo, 'Éléments antiques sous le Palais de la Chancellerie', *Mélanges de l'Ecole Française de Rome; Antiquité,* 96, no 2 (1984), pp. 847–906 (pp. 866, 875–77 and 881); the contemporary writer Raffaele Maffei used the façade of the Cancelleria as an example of *opus isodomum* in his 1506 *Commentariorum urbanorum;* see Margaret Daly Davis, '"Opus isodomum" at the Palazzo della Cancelleria: Vitruvian Studies and Archaeological and Antiquarian Interests at the Court of Raffaele Riario', in *Roma, centro ideale della cultura nei secoli XV e XVI,* pp. 442–57 (p. 445); Clarke, *Roman House,* p. 213; Brothers has suggested that, in the manner of literary concepts of imitation, the Cancelleria takes architectural details from several ancient models to create a new *all'antica* model; see Brothers, 'Architecture, Texts, and Imitation', pp. 87–92.

37 According to the construction documentation, travertine for the Cancelleria was brought from the Colosseum and the areas around S. Giorgio al Velabro and S. Pietro in Vincoli. In addition, Lanciani has claimed that additional stone was taken from the Temple of Castor and Pollux, the Quirinal Temple and the Arch of Gordian; see Lanciani, *Destruction*, p. 211; Enzo Bentivoglio, 'Nel cantiere del palazzo del card. Raffaele Riario (la Cancelleria): organizzazione, materiali, maestranze, personaggi', *Quaderni dell'Istituto di Storia dell'Architettura,* 169–74 (1982), pp. 27–34 (pp. 28–29).

38 Valtieri, 'La fabbrica', pp. 3–5.

39 The columns of the courtyard have a variety of ancient provenances according to the study conducted by Olwen Williams-Thorpe. His breakdown of thirty-nine shafts is as follows: Elba/Giglio (10), Aswan (8), Mons

Claudianus (8), Troad (8), Corsica (2), Kozak or Western Turkey (2), Sardinia (1); see Williams-Thorpe, 'A Thousand and One Columns', supplementary dataset.

40 Bentivoglio, 'Nel cantiere', p. 28.

41 Ibid. Based on this diameter, it is likely that the original column shafts were forty Roman feet high. Given that the columns of the frigidarium of the Baths of Diocletian remain in situ, those used for the Cancelleria piers may have instead been part of the now largely destroyed caldarium. Numerous Renaissance drawings illustrate the caldarium with eight columns nearly as large as those of the frigidarium.

42 In 1497, Francesco d'Arezzo was paid for an 'asse per lo carro grande', a master Paolo *carraro* was paid for a 'cassa per lo carro grande', and two additional columns were brought from the area around S. Giovanni in Laterano, Bentivoglio, 'Nel cantiere', pp. 28 and 30. The source of the other columns is unknown. The 1988–1993 excavation of S. Lorenzo in Damaso demonstrated it is unlikely any of the columns came from the old basilica. It is more probable that a number came from the nearby Porticus and Theatre of Pompey. According to excavations, these monuments contained columns of *africano, cipollino*, porphyry and grey granite, the lattermost being by far the greatest number. The *scaenae frons* of the theatre is also said to have been built of red granite; see Maria C. Gagliardo, and James E. Packer, 'A New Look at Pompey's Theater: History, Documentation, and Recent Excavation', *American Journal of Archeology* 110, no. 1 (Jan. 2006), pp. 93–122 (pp. 100–01 and 117).

43 On moving monolithic columns, see Gianluca Belli, 'Notes sur le transport et le soulèvement des colonnes dans l'architecture des XVe et XVIe siècles', in *La colonne: Nouvelle histoire de la construction,* ed. Roberto Gargiani (Lausanne, 2008), pp. 91–115.

44 It is almost certain that the granite columns of the courtyard were re-carved, since acquiring a matching set of this size was probably impossible by the fifteenth century and all the column shafts have unusually large lower fillets. The column shafts of the ground floor loggia on average measure 59.2 cm in diameter above their lower apophyge, while the smaller columns of the upper storey on average measure 49.3 cm in diameter at this same point.

45 Butters, *Triumph of Vulcan*, pp. 204 and 445–64, appendix XII no. 13.

46 Ibid.

47 Vasari claimed that Alberti 'experimented with tempers for his steel chisels but progressed only slowly, and was unable to cut the clean edges and corners that *all'antica* lettering demanded'. Giuliano da Sangallo is the only figure to have left evidence of his tempering recipe, which is based on the medieval tradition of using the urine of a he-goat fed on ivy; see Butters, *Triumph of Vulcan*, pp. 143, 187 and 205; Donatello, as early as 1464, is said to have carved the Elban granite baluster that supports his bronze *Judith and Holofernes*, which was originally located in the garden of the Palazzo Medici in Florence. The statue base was modified when the Florentine Republic confiscated the work in 1495, but the baluster, as Caglioti has convincingly argued, is part of the original ensemble. Caglioti has also noted there is a similar granite baluster supporting a font dating from the 1470s in the Florentine church of S. Croce; see Francesco Caglioti, *Donatello e i Medici: storia del* David *e della* Giuditta (Florence, 2000), pp. 81–100.

48 'le colonne antiche di graniti diversi […] e per memoria di quello e per veneratione della materia ch'hà dell'eterno'; Cesare D'Onofrio, *Roma nel Seicento* (Florence, 1969), p. 159.

49 'Denique eo popularis ineptiae caecitatisque perventum, ut cum eum lapidem intueantur, non colore modo sed ipsa etiam materia scalpris ferreis resistentem, resilientibusque favillis, crustulas tamen excidunt iterum atque iterum olfacientes manuque librantes, postremo palam blacterantes non humana vi sed necromantiae maleficio, artibus magicis, Virgilianisque cantationibus id opus effectum*'*: Brian Curran and Anthony Grafton, 'A Fifteenth-Century Site Report on the Vatican Obelisk', *Journal of the Warburg and Courtauld Institutes,* 58 (1995), pp. 234–48 (pp. 245 and 248).

50 Vasari, *Vasari on Technique*, pp. 40 and 42. At the Cancelleria, payments made in 1502 and 1503 for '*smeriglo*' and '*casse della polvere delle cholonne*' suggest that the granite columns were polished using boxes filled with emery; see Bentivoglio, 'Nel cantiere', p. 30.

51 '*Quarum quamlibet, ut a cardinalibus accepi, centum uiri uix per annum secare, polire, atque perficere potuerunt*'; see Gordon Rushforth, 'Magister Gregorius de Mirabilibus Urbis Romae: a New Description of Rome in the Twelfth Century', *The Journal of Roman Studies*, 9 (1919), pp. 14–58 (p. 52); Master Gregorius, *The Marvels of Rome*, trans. John Osborne (Toronto, 1987), p. 27.

52 The extraordinary nature of working hard stones and the need for tempered chisels was also prominently mentioned among hundreds of references to ancient marbles in the *Hypnerotomachia Poliphili* (1499). For example, the protagonist Poliphilo was 'stupefied as I considered how hard and resistant the stones were that supported the great basin,' which could only have been carved 'with special chisels and burins, tempered

in a way that is lost to our modern craftsmen'; see Francesco Colonna, *Hypnerotomachia Poliphili: The Strife of Love in a Dream*, trans. Joscelyn Godwin (London, 1999), pp. 91–92; Butters, *Triumph of Vulcan*, p. 186.

53 It is reasonable to conclude that, if the builders of the Cancelleria had access to four column fragments at least five metres high and a metre and a half in diameter, then they would have made the ground-floor piers out of single pieces of granite. In having instead to rely on smaller fragments, they made ingenious use of central marble bands. Similar central bands can be seen on the rectangular peristyle columns of the House of Julia Felix in Pompeii, although this was obviously not known in the Renaissance. Valtieri notes that Lorenzo da Viterbo's *Ascension* fresco in the Cappella Mazzatosta of S. Maria della Verità in Viterbo depicts square columns with decorated central bands; see Valtieri, 'La fabbrica', p. 24, note 86 and fig. 53.

54 Vitruvius, *The Ten Books on Architecture*, trans. Morris Hicky Morgan (Cambridge, 1914), p. 190 (Book VI, 8, section 4); Vitruvius, *De architectura*, ed. Fra Giocondo (Venice, 1511), pp. 63r and 64r; Christoph L. Frommel, 'I chiostri di S. Ambrogio e il cortile della Cancelleria a Roma: un confronto stilistico', *Arte lombarda*, 79 (1986), pp. 9–18 (pp. 12–14); Christoph L. Frommel, 'Il Palazzo della Cancelleria', in *Palazzo dal Rinascimento a oggi, in Italia nel regno di Napoli in Calabria,* ed. Simonetta Valtieri (Rome, 1989), pp. 29–53 (pp. 34 and 49); Clarke, *Roman House*, pp. 122–23 and 257–58.

55 These drawings include Vatican City, Biblioteca Apostolica Vaticana, Barb. Lat. 4424, Codex Barberini, f. 67r; London, Sir John Soane's Museum, Codex Coner, f. 5r; Florence, Uffizi, Gabinetto Disegni e Stampe, 1863 Ar; Salzburg, Universitätsbibliothek, Ms. Ital. M III 40, f. 27v.

56 On the mosaics, see especially Alexander Nagel and Christopher Wood, *Anachronic Renaissance* (New York, 2010), pp. 334–45.

57 'Bramante sia stato il primo à metter in luce la buona, e bella Architettura, che da gli Antichi fin'à quel tempo era stata nascosa': Andrea Palladio, *The Four Books on Architecture*, trans. Robert Tavernor and Richard Schofield (Cambridge, 1997), p. 276 (Book 4, p. 64).

58 Vasari, *Le vite*, IV, p. 154.

59 Freiberg has demonstrated that the foundation stone for the Tempietto was laid in 1502. Nevertheless, there are no indications as to when the design was finalised and construction occurred. For an overview on the question of dating, see most recently Jack Freiberg, *Bramante's Tempietto, the Roman Renaissance and the Spanish Crown* (Cambridge, 2014), pp. 137–57, and 262 note 2; and David Hemsoll's review, *The Burlington Magazine,* 157, no. 1352 (Nov. 2015), 9p. 788–89.

60 Wolfgang Lotz, *Architecture in Italy 1500–1600* (New Haven, 1995), p.12.

61 Palladio, *Four Books*, p. 276 (Book 4, p. 64).

62 According to the geologist Lorenzo Lazzarini, the columns are made from three types of granite: Kozak (13), Troad (2) and Elba/Giglio (1); see Freiberg, *Bramante's Tempietto*, pp. 106 and 252 note 23. Their proportional slenderness (about 1:7.9) and the chipping seen on their interior faces of the column shafts has led several scholars to suggest that the columns were reused as found. Yet it is also possible that the relatively uniform spalling could be the product of weathering or later damage. Likewise, it is plausible that some of the columns maintain their ancient proportions while others have been re-carved. Freiberg has recently suggested that the thirteen shafts made of Kozak granite form an unaltered matching set, while the other three were probably re-carved; see Freiberg, *Bramante's Tempietto*, pp. 106. See also Derek A.R. Moore, 'Notes on the Use of Spolia in Roman Architecture from Bramante to Bernini', in *Architectural Studies in Memory of Richard Krautheimer,* ed. Cecil L Striker (Mainz, 1996), pp. 119–22 (pp. 119–20); Dittscheid, Hans-Christoph, 'Form versus Materie. Zum Spoliengebrauch in den römischen Bauten und Projekten Donato Bramantes', in *Antike Spolien,* pp. 277–307 (p. 278); Bosman, *The Power of Tradition*, p. 113; Arnaldo Bruschi, 'L'architettura a Roma negli ultimi anni del pontificato di Alessandro VI Borgia (1492– 1503) e l'edilizia del primo Cinquecento', *Storia dell'architettura italiana: il primo Cinquecento,* ed. Arnaldo Bruschi (Milan, 2002), pp. 34–75 (p. 62).

63 See Mark Wilson Jones, 'The Tempietto and the Roots of Coincidence', *Architectural History,* 33 (1990), pp. 1–28 (p. 24).

64 Dittscheid, 'Form versus Materie', p. 280. A similar concept of Christianisation would also apply to using a round peripteral temple for a Christian purpose, and replacing pagan objects of sacrifice in the Doric frieze, such as bucrania, with Christian liturgical items.

65 According to the medieval *Mirabilia urbis Romae*, S. Stefano Rotondo was the former Temple of Faunus. In the Renaissance, Biondo, Fauno, Fulvio and Marliani reiterated this tradition in their guidebooks. As regards S. Costanza, the latter two authors as well as others claimed it had been a Temple of Bacchus that Pope Alexander IV had re-consecrated in the thirteenth century. See Master Benedict, *Marvels of Rome*, trans. Francis Morgan Nichols, 2nd edn (New York, 1986), p. 45; Robert Burn, *Rome and the Campagna: An Historical and Topographical Description of the Site, Buildings, and Neighbourhood of Ancient Rome* (Deighton,

1876), p. 202 note 10; R. Ross Holloway, *Constantine and Rome* (New Haven, 2004), p. 100. On the connection of the Tempietto to these churches, see especially Earl Rosenthal 'The Antecedents of Bramante's Tempietto', *Journal of the Society of Architectural Historians*, 23, no. 2 (May, 1964), pp. 55–74 (pp. 65–68); Timothy Verdon, 'Bramante and Early Christian Spatial Articulation', *Arte Lombarda*, 86/87, no. 3–4 (1988), pp. 181–86; Wilson Jones, 'Tempietto', pp. 19–21; Hubertus Günther, 'La ricezione dell'antico nel Tempietto', in *Donato Bramante: ricerche, proposte, riletture,* ed. Francesco Paolo di Teodoro (Urbino, 2001), pp. 267–302.

66 See James Ackerman, *The Cortile del Belvedere* (Vatican City, 1954). Bruschi, Frommel, and others have suggested that the stairway may have been designed as early as 1504; Arnaldo Bruschi, *Bramante architetto* (Bari, 1969), p. 417; Christoph L. Frommel, 'I tre progetti bramanteschi per il Cortile del Belvedere', *Il Cortile delle Statue: Der Statuenhof des Belvedere im Vatikan*, ed. Matthais Winner, Bernard Andreae and Carlo Pietrangeli (Mainz, 1998), pp. 17–66 (p. 44).

67 Christiane Denker Nesselrath, *Bramante's Spiral Staircase* (Vatican City, 1996), p. 11. The staircase as built has thirty-six columns, but Christiane Denker Nesselrath suggests that the four final granite columns were added in the 1560s. I agree with her assessment, which explains why the thirty-second column shaft is made of grey marble rather than of granite. A similar spiral staircase attributed to Baldassare Peruzzi at the Villa Petrucci outside of Siena (*c.* 1511) has no columns on its final revolution.

68 Denker Nesselrath, *Bramante's Spiral Staircase,* p. 21; for measurements of the columns, see Frommel, 'I tre progetti', pp. 64–5, appendix.

69 Studies of the orders as they apply to the staircase include: Bruschi, *Bramante*, pp. 428–33; Christiane Denker Nesselrath, *Die Säulenordnungen bei Bramante* (Worms, 1990), pp. 27–34, 60–62, 78–79 and 107–109; Frommel, 'I tre progetti', pp. 42–48.

70 '*si può dire ch'ei suscitasse la buona Architettura, che da gli antiqui fino a quel tempo era stata sepulta*'; see Sebastiano Serlio, *Sebastiano Serlio on Architecture,* trans. Vaughan Hart and Peter Hicks (New Haven, 1996), p. 127 (Book 3, p. 36).

71 The entryway of an early sixteenth-century palace (Via delle Coppelle, 74) also features two granite columns. Outside Rome, the Chiostro dei Benefattori at the Abbey of Montecassino (*c.* 1513) and the southern loggia of the Palazzo Colonna in Genazzano both employ spoliated granite columns.

72 Giuseppe Cugnoni, 'Note al Commentario di Alessandro VII sulla vita di Agostino Chigi', *Archivio della Societa romana di storia patria,* 3, no. 4 (1880), pp. 422–48 (p. 440); John Shearman, 'The Chigi Chapel in S. Maria del Popolo', *Journal of the Warburg and Courtauld Institutes,* 24, no. 3/4 (July, 1961), pp. 129–60 (p. 154).

73 The courtyard of Casa dei Fabi (Via Portico d'Ottavia, 13) was built, based on stylistic and historical evidence, in the early sixteenth century. The Fabi family claimed to be descended from the prominent ancient Roman Fabius family (*gens Fabia*); see *Guide Rionali di Roma: Rione XI – S. Angelo*, ed. Carlo Pietrangeli, 3rd edn (Rome, 1976), p. 38.

74 This dating is based primarily on a drawing by Jean de Chenevières, which Frommel dates to between 1518 and 1526; Munich, Bayerischen Staatsbibliothek, Cod. icon. 195, f. 8r; Christoph L. Frommel, *Der Römische Palastbau der Hochrenaissance*, 3 vols (Tübingen, 1973), II, p. 119.

75 It is unknown where these columns came from, but a *breve* issued by Leo X on 5 March 1514 records the concession of land in the area of S. Lorenzo fuori le Mura for the acquisition of '*lapides marmores Tibertinos columnas capitella et bases vasa lapidea et cuiusvis generic ornamenta vel metalla*'; see Frommel, *Römische Palastbau,* II, p. 103, doc. 8.

76 '*Apud quas palatium visitor Alexandri Farness [...] quod palatium hoc anno a fundamentis ipse sumptuosissime reparare incepit, marmoreis et plucris columnis illud ornatum reddens*'; Fra Mariano da Firenze, *Itinerarium urbis Romae,* ed. Enrico Bulletti (Rome, 1931), p. 64.

77 Howard Hibbard, 'The Architecture of the Palazzo Borghese', *Memoirs of the American Academy in Rome,* 27 (1962), pp. 1–151 (pp. 32–53).