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The taste of our century, or at least of our nation, is different from that of the Ancients.

Claude Perrault

1. François Blondel and the French Academic Tradition

Architectural thought in France at the start of the seventeenth century, like that in Italy and Spain, was predicated on the notion that the art of architecture participated in a divinely sanctioned cosmology or natural order: a stable grammar of eternally valid forms, numbers, and proportional relations transmitted to the present from ancient times. Jean Bautista Villalpanda, in his 1604 commentary on the prophet Ezekiel and Solomon's Temple, attempted to prove that these numbers and proportions not only were compatible with the Vitruvian tradition but were given to Solomon directly by God himself.¹ Within a few years, this tenet, more broadly considered, would meet philosophical resistance in the person of René Descartes (1596-1650). In his Rules for the Direction of the Mind, written sometime before 1628, Descartes noted: "Concerning objects proposed for study, we ought to investigate what we can clearly and evidently intuit or deduce with certainty, and not what other people have thought or what we ourselves conjecture."² In this clash of two different systems of values - inherited tradition and the confident power of human reason - resounds the first stirrings of modern theory.

Descartes's third "rule," as he termed it, is even richer in its implications. Inherent within it is the principle that came to be known as "Cartesian doubt," that is, the provisional and methodic suspension of belief in any knowledge gained simply through books or idle speculation. Such critical skepticism was necessary, the philosopher insisted, both to separate modern science from the prejudices of late scholastic and ancient thought and to ground it anew on "clear and distinct" ideas. The teachings and terminology of Aristotle, to cite an example used by Descartes himself, were no longer to be taken as sacrosanct; the modern critical mind should approach each problem anew on the basis of empirical results and the methods of deductive reasoning.

Cartesianism would become very much in vogue in French scientific circles by midcentury, and around this time we also begin to find similar attitudes expressed in the arts. Writing in 1650, the architect Roland Fréart de Chambray (1606-76) opened his Parallèle de l'architecture antique avec la moderne (Parallel of ancient architecture with the modern) with the suggestion that contemporary architects should eschew the "blind respect and reverence" that antiquity and long custom had imposed on architectural thinking, because "the mind is free, not bound" and "we have as good right to invent, and follow our Genius, as the Antients, without rendering our selves their Slaves."3 Fréart's distancing of modern architecture from that of the ancients, however, was not unqualified. In the philosophical tenor of the day, he bases his book "on the Principles of Geometry," because essential beauty in architecture resides in the "Symmetry and Oeconomy of the whole," or rather in the "visible harmony and consent, which those eyes that are clear'd and enlightened by the real Intelligence of Art, contemplate and behold with excess of delectation."4

Delectation aside – Fréart's skepticism toward the past incited little enthusiasm among his colleagues, and his admonition to moderate one's "blind respect and reverence" for antiquity found few adherents. France in the second half of the century, in fact, pursued the classical ideal with increasing attention and aplomb. The cultural backdrop to

this classical revival was the reign of Louis XIV, who assumed the throne in 1661 with a compelling ambition to elevate the standing of France in every field. Initially, at least, he was enormously successful, in part because France had emerged from the Thirty Years' War (1618-48) as the strongest and most prosperous nation of a much transformed Europe. Given that the population of France was four times that of England and eighteen times that of the Dutch Republic, Louis possessed both the manpower and resources to plan great ventures. He was also fortunate in having at his side, as his chief minister and superintendent of building, the very capable Jean-Baptiste Colbert (1619-83).⁵ Writing almost a century later - and addressing himself specifically to readers possessing both intelligence and the "still more rare" attribute of good taste - Voltaire equated the era of Louis XIV with those of Alexander, Augustus, and the Medicis, the era "in which the arts were carried to perfection, and which, by serving as the era of greatness of the human mind, are examples for posterity."6

It was an era of wonder to be sure. French missionaries of the Jesuit order were probing the reaches of the world in such distant places as China and North America. Colbert was sending emissaries to other exotic or little known spots, both to forge relations and to seek out selected treasures for the French crown. Typical of these ventures were the efforts of Charles François Olier, the Marquis de Nointel, who in 1670 was sent to Constantinople to negotiate a trade treaty with the Ottomans. Nointel returned by way of Egypt and Greece, where his two artists (foremost Jacques Carrey) famously recorded the (still intact) sculptures decorating the Athenian Parthenon. At home, Colbert focused his attention on founding or reorganizing various academies as well as on directing building enterprises on behalf of the young king. His efforts in both these endeavors conspired to change the course of architectural theory.

The term *academy* of course goes back to the park within Athens in which Plato conversed with his students; the word was revived in fifteenth-century Italy, when it became widely applied to any philosophical discussion, formal or informal. The circle of intellectuals gathered around Giangiorgio Trissino in Vincenza, where Palladio began his higher education in the 1530s, was called an academy because of its emphasis on propagating classical learning. In 1555, Palladio helped to organize the Accademia Olimpica, which deliberated not only on classical works but also on questions of mathematics. One of the first academies devoted entirely to the arts was the Accademia del Designo, founded in Florence in 1563. It held regular weekly meetings and planned an educational program, although this program remained largely confined to paper. By contrast, the Accademia de San Luca in Rome, inaugurated in 1593, quickly became celebrated as the premier school for instruction in the theory and practice of the arts.⁷

In France, the early academies were also private, but in 1635 Cardinal Richelieu founded the French Academy. The concern of this institution initially was limited to producing a dictionary of the French language and providing rules for literary composition. More important was the founding of the Royal Academy of Painting and Sculpture in 1648, which was conceived - after the Roman model of San Luca as a school for practical instruction. In the 1660s, after Louis XIV ascended to the throne, the state embarked on an ambitious program of academic expansion and reorganization. The Academy of Dance was founded in 1661; two years later the so-called Little Academy, an offshoot of the French Academy and the forerunner to the Academy of Inscriptions and Belles Lettres, came in existence. In 1664, Colbert completely reformed the Academy of Painting and Sculpture and provided it with a constitution mandating instruction; in conjunction with its reformation, he opened the French Academy in Rome in 1666, to which the best students in the arts were invited to complete their training. In the same year was founded the Academy of Sciences, and in 1669 the Academy of Music. Perhaps the crown jewel of this elaborate academic bureaucracy was the Royal Academy of Architecture, which opened its doors in 1671.⁸ With the founding of these institutions, Colbert and the king had accomplished several things. First, they created a prestigious class of "academicians" with special privileges and responsibilities for instruction; second, they brought all artistic instruction under a centralized authority. The rules of each discipline were now to be strictly mandated; further, they were to be based on ancient and Renaissance precedents.

The first director of the Royal Academy of Architecture was a fifty-three-year-old mathematician and engineer, François Blondel (1618–86).⁹ Although he had come late to architecture, Blondel was an interesting polymath with considerable intelligence and solid accomplishments. Over the course of a lengthy career, he had distinguished himself in military and naval battles; undertook a diplomatic mission to Turkey; visited Italy, Greece, and Egypt; gave lectures on mathematics at the Collège de France; and served as an ambassador to Denmark. In France he had attended to fortifying arsenals and to improving the defense of seaports. Immediately preceding his appointment, he had served as the mentor to Colbert's second son on his Italian tour.

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The purpose of the Royal Academy of Architecture was not only to codify the principles of classical design but also to espouse these principles, which it did by holding two public lectures a week. The first hour of each session was devoted to the theoretical side of architecture; this was followed by a talk on a technical aspect of the field, such as the rudiments of Euclidean geometry. With much fanfare, the inaugural address by Blondel took place on 31 December 1671. The new director, after reciting the litany of advantages to be acquired from mastering the nuances of architecture, urged his students to pursue their profession by taking advantage of the financial generosity of the king – "the grandeur of his virtues and actions" – under the management of Colbert.¹⁰

That Blondel's mandate had been defined by the curricula of earlier academies goes without saying, but architecture too had its unique set of problems. Perhaps foremost was the reform of the classical tradition in light of the perceived abuses of the baroque period. And herein also lay France's declaration of architectural independence - its desire to define itself apart from the Italian classical legacy and to surpass the works of Italian architects with its own achievements. Thus in many ways antiquity and not the Renaissance became the new starting point for French theoretical development. If modern French architecture, in line with the other arts, was to emulate the masterworks of Roman antiquity, great care had to be taken to select approved models. In the realm of theory, the teachings of Vitruvius naturally took precedence, and only when this author left matters in doubt were the Renaissance interpretations of Palladio, Scamozzi, Vignola, Serlio, and Alberti to be consulted for edification.¹¹

Blondel was also charged with publishing his own lectures on theory, which he did between 1675 and 1683 in two large volumes, Cours d'architecture (Course of architecture). His teachings rested on the very traditional notion that architectural beauty derives primarily from proportions.¹² Further, he believed that architectural proportions (perceived by the eye), like musical tonalities (perceived by the ear), emanate from a higher cosmic order, and the perception of these consonances is made possible by an idea divinely implanted in the mind. Indeed, Blondel accepted the arguments of his friend, the musicologist René Ouvrard, who in his Architecture harmonique (Harmonic architecture) would insist "that a building cannot be perfect if it does not follow the same rules as composition or the harmonizing of musical chords."13 Proportional relations were still considered to compose the essence of architectural practice; beauty as an ideal was presumed to be absolute in the mind's discernment of these proportional ratios. The skepticism that Fréart de Chambray had voiced toward antiquity a quarter of a century earlier is occasionally echoed in Blondel's analyses, but not in a way that would offend the votaries of the past. Architecture at the start of the reign of Louis XIV was repositioned squarely within the classical tradition.

2. Claude Perrault and the Louvre

The second front of Colbert's influence on the arts derived from his position as superintendent of buildings, royal manufacturers, commerce, and fine arts – a post he assumed on 1 January 1664. This position gave him nearly full control of the many new artistic and architectural initiatives of the monarch. One of Colbert's first acts, for instance, was to nationalize the Gobelin tapestry factory in Paris and bring it under the authority of Charles Le Brun, the first painter to the king. Hundreds of workers with skills in painting, sculpture, engraving, goldsmithing, cabinet making, weaving, dyeing, and mosaics were enticed from abroad (mainly from Italy) – all, of course, for the greater glory of France.

The principal architectural project under consideration at this time was the eastern extension of the Louvre, the building that was to serve as the urban residence of the new king. The history of its construction is a complicated one.¹⁴ The original turreted castle on the site dated back to early medieval times, but it had been gradually dismantled during two building campaigns undertaken in the sixteenth and early seventeenth centuries. In 1546, Pierre Lescot (d. 1578) produced his masterful design for the southwest corner of the now existing square court, which formed the anchor for the new expansion. Beginning in 1624, Jacques Lemercier (1582-1654) devised a more ambitious master plan and doubled this building, adding as well a new central pavilion. The plan was to construct northern and southern wings at each end and join them at the eastern end with a new building, forming a square with an interior court. Some work was completed on the basement of the north wing, but construction was halted in 1643 when Louis XIII died.

In 1659, as Louis XIV approached his ascension to the throne, work resumed. In that year, the king's first architect, Louis Le Vau (1612–70), prepared a new design for the complex, and construction resumed. Soon the south wing was largely finished, and the foundations and a portion of wall along the eastern ceremonial front were erected. Then Colbert assumed office, and the situation just as quickly changed. Unhappy with Le Vau's design, Colbert, as early

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as 1662, had been privately seeking alternatives. Upon assuming his new post in 1664, Colbert solicited proposals from other French architects, including Jean Marot, Pierre Cottart, and François Mansart. Two schemes in particular had an important influence on the final outcome. One was for an open colonnade of Corinthian columns along the eastern front, a feature not present in Le Vau's design. This design, exhibited anonymously in Paris in 1664, turned out to be the work of Claude Perrault (1613–88), the older brother of Colbert's private secretary, Charles Perrault (1628–1703). The second design also had a freestanding colonnade along the eastern facade, but its columns were arranged in pairs. This alternative was proposed by François Le Vau (1613–76), the younger brother of Louis Le Vau.¹⁵

François Le Vau's proposal, however, was not sent to Colbert until December 1664. Earlier, in March of that year, Colbert had requested a proposal from the Italian baroque architect Gianlorenzo Bernini (1598–1680), which arrived in Paris in June. By December 1664, Colbert had evidently decided in favor of the Italian architect, and on behalf of the king, he asked Bernini to prepare a revised proposal and undertake the journey from Rome to Paris. The story of Bernini's triumphant (and costly) carriage ride into the French capital on 2 June 1665 has often been recounted.¹⁶ In the end, however, the trip would prove futile, because his revised design would be greeted with harsh criticism by French architects as well as by Colbert's secretary, Charles Perrault, and eventually it would be ignored by the king himself.¹⁷ Construction of the east wing was halted in October, shortly after Bernini's departure, and the project languished until the spring of 1667. Then Colbert appointed a new committee (a *petit conseil*) to reconsider the design and come up with a new proposal.¹⁸ This design committee was composed of three individuals: Charles Le Brun (the king's first painter), Louis Le Vau (still the king's first architect), and the author of the unsolicited design proposal of 1664, Claude Perrault.

From an historical distance of more than three hundred years, it is of course impossible to understand fully the reasons for the selection of the architecturally inexperienced Perrault, although the political support of his younger brother, together with Colbert's desire to have a voice on the committee, almost certainly played a role. But it can be said that he was a man of considerable stature (Fig. 1). Up to the time of his first proposal for the Louvre, the fifty-one-year-old Perrault had shown no interest in architecture, except possibly for some changes he made to his country house at Viry.¹⁹ He had taken his medical degree



1. Claude Perrault, from *Artist Portraits: Scrapbook, 1600–1800.* Courtesy Collection Centre Canadien d'Architecture/Canadian Centre for Architecture, Montréal.

from the Ecole de Médecine in 1642 and over the next two decades occasionally gave lectures on anatomy and pathology there. He maintained a small medical practice, although his professional interests eventually gravitated toward scientific research. He was, in fact, a consummate Cartesian in his scientific outlook. In addition to conducting numerous anatomical dissections on animals from the royal menagerie, he had studied problems of botany, geology, and mechanics. On one occasion he even conducted experiments on the speed of sound with the famed Dutch physicist Christiaan Huygens. In 1666, one year before his appointment, both Perrault and Huygens were elected to the first class of the Academy of Sciences, a prestigious appointment that had to be approved by Colbert. Thus his scientific accomplishments were certainly known to the latter.

Claude Perrault also possessed another skill that was relatively rare in Paris, a command of both Latin and Greek. This must have stood him in good stead when – probably late in 1666 – Colbert sought a translator for his state-sponsored

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2. The Louvre, 1674, engraving of Sébastien Le Clerc, *Lifting of the Louvre Pediment Stones*, 1674. Courtesy Collection Centre Canadian d'Architecture/Canadian Centre for Architecture, Montréal.

translation of Vitruvius, a project no doubt conceived together with his plans for the future Academy of Architecture. Perrault's selection for the translation also seems to have accelerated his architectural interests or perhaps dovetailed with them. Late in 1666 he made a proposal for an obelisk to be dedicated to Louis XIV.²⁰ Perrault was also commissioned in the spring of 1667 to be the architect of the new Royal Observatory, the building that was to house the meetings of the Academy of Sciences.²¹ This commission preceded by only a few weeks the first meeting of the building committee for the Louvre.

To what extent Perrault contributed to the final design of the Louvre (for which he would later take sole credit) has always been a point of historical contention, but it seems likely that the design was genuinely a committee project. (Figs. 2 and 3).²² The atelier of Louis Le Vau produced the



3. Iron reinforcement bars in Louvre colonnade, from Pierre Patte, Mémoires sur les objets les plus importans de l'architecture (Paris, 1769). Courtesy Collection Centre Canadien d'Architecture/Canadian Centre for Architecture, Montréal.

first drawings in April and May 1667. These contained the motif of coupled or paired columns along the main story of the eastern front, and it is likely that the seed for this design had been planted by the earlier scheme of François Le Vau. But Perrault also contributed much to the new design during its stages of development, and his responsibilities seem to have expanded as the project underwent refinements, down to the final design of 1668.²³ With his background in science and his broad knowledge of mechanics, he no doubt assisted in devising the ingenious structural solution for the colonnade, with its hidden but elaborate network of iron bars holding the masonry parts together.²⁴ He also probably devised some of the constructional machinery for the work. In any case, the straight entablature of the Louvre, spanning nineteen feet between its paired columns, would eventually be hailed as one of the great masterpieces of French classicism. Perrault's authorship, real or merely claimed, was sufficiently known for him to include the building - together with his other architectural designs - in the frontispiece of his similarly masterful translation of Vitruvius, which appeared in 1673.

3. The Quarrel of the Ancients and the Moderns

The Louvre design and the translation of Vitruvius together represent one of those rare moments in architecture when revolutions in practice and theory perfectly coincide. Perrault employed his annotations to the translation, in fact, to explain the Louvre design. The crucial note appears in the third chapter of Book 3, in which the Roman author lauds the innovations of the Hellenistic architect Hermogenes, specifically his modification to the dipteral temple through the removal of the inner row of a double range of columns.²⁵ This design simplification, Vitruvius argues, had both the functional advantage of creating a passage for people behind the outer colonnade and the aesthetic advantage of visually lightening the appearance of the temple and thus endowing it with a certain majesty. Perrault shrewdly seizes this passage as a justification for the use of coupled columns along the east facade of the Louvre:

The taste of our century, or at least of our nation, is different from that of the ancients and perhaps it has a little of the Gothic in it, because we love the air, the daylight, and openness [*dégagemens*]. Thus we have invented a sixth manner of disposing of columns, which is to group them in pairs and separate each pair with two intercolumniations.... This has been done in imitation of Hermogenes.... What he did by removing a range of columns in each aisle, we do within a colonnade by removing a column from the middle of two columns and pushing it toward the adjacent column. This manner could be called the Pseudosystyle.²⁶

Perrault's reference to "a little of the Gothic" alludes not to the formal or decorative aspects of Gothic architecture but rather to the efficiency of its structural system, that is, to the lightness of its vertical supports when contrasted with the squatter proportions of classical columns. In 1669 Perrault had undertaken a trip to the south of France, where he sketched and took notes on both medieval and classical buildings, among them the vaults of the church of Saint-Hilaire-le-Grand in Poitiers ("la structure est assez particulière") and the cathedral of Saint-André in Bordeaux.²⁷ In the latter city, he also studied the ruins of the amphitheater and the columnar remnants of a Gallo-Roman temple (now destroyed), the Piliers de Tutelle.²⁸ These two works were important to Perrault for what they displayed of the constructional techniques of Roman architecture. More important, however, was his exposure to and appreciation of the comparative structural efficiencies of medieval or Gothic works ("l'ordre gothique"). He returned to Paris not only with a sense of their structural ingenuity but also with an aesthetic taste for their visual lightness.

Also noteworthy in the quoted passage is the term rendered as "openness" – *dégagmens* or *dégagement*, which literally means "disengagement." Perrault is referring to the separation of the colonnade from the wall of the palace behind and to the overall lighter spatial sensation that results from this separation. It was a criticism of Italian Renaissance architecture, the fact that it relied on heavy exterior walls with reinforcing pilasters. Perrault argues that the openness of the colonnade and the reduction in the load to be borne by the wall behind allow larger windows in the wall and thus the enhancement of natural light and ventilation (air). This point was made by Perrault despite the fact that the original windows planned for the Louvre wall were (in 1668) transformed into solid niches.²⁹

A third important term that appears in Vitruvius's original text, the Latin word *asperitas* (translated into French as *aspreté*, now *âpreté*, also the English *asperity*), which Vitruvius used to describe the visual effect of the new design of Hermogenes. This was the effect of the lighter colonnade throwing the temple walls into deep relief. The word signifies a roughness or unevenness of surface, but Perrault employs the term in French to refer to the "lively aspect" or "picturesque vista" induced by the colonnade,

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in other words the visual tension in relief when perceived in perspective.³⁰ *Dégagement* and *âpreté* will later become key terms in French theory and discussions in which they occur inevitably point back to this particular passage.

Perrault's very unclassical allusion to Gothic taste, as well as his defense of a coupled column for the Louvre (with few ancient or Renaissance precedents), interestingly, did not evoke an immediate reaction within academic circles. In fact, when this particular passage was read to the Academy of Architecture in December 1674 (as part of weekly readings of the entire book), it passed without comment, even though the assembly did find a "difficulty" with another footnote, on columnar diminution, that appeared a few lines later.³¹ The sense of professional decorum apparent in these proceedings may have hindered overt confrontation, but Perrault's various concerns regarding accepted features of classical theory at the same time called into question the teachings of Blondel. A response was therefore inevitable, and it came in 1683, when Blondel published the second volume of his Cours d'architecture. The academy director, in fact, devoted three chapters of his book to contesting this particular footnote and also mounted a harsh attack on the Louvre design. His response essentially defined the opening round of a broader cultural debate in France, later known as the "quarrel between the ancients and the moderns," in which Blondel, through his defense of antiquity, took the side of the ancients.

With regard to the Louvre design, Blondel was above all suspicious of the amount of reinforcing iron used in the colonnade. Solidity in architecture, he insisted, requires architects not to take shortcuts that reduce "confidence" in the stability of the design, and in any case the ancients, with their heavier buildings, did not have to rely on this recourse.³² He also questioned the structural advantages of the coupled-column solution, which Perrault had argued was structurally superior because the composite beam spanning the larger intercolumniation of paired columns rested wholly on the inner column at each end. Blondel replied that these structural advantages were not real - essentially by incorrectly speculating that the negative bending movement of a cantilevered beam causes its ends to raise up, thus inducing greater stress at the inside corners of the supporting columns.³³ As there was no way at the time to consider these issues mathematically, it should be noted that Perrault originally demonstrated the coupled-column, quasi-cantilevered solution to his peers by building a model in iron and stone in the laboratory, to the scale of one inch per foot.³⁴

In his book, Blondel devotes much time to searching for ancient and Renaissance precedents for Perrault's scheme and its rationalization. On the first front, he finds too few precedents of coupled columns or pilasters in antiquity or the Renaissance (for the latter, he cites the Belvedere, the House of Raphael by Bramante, as well as Michelangelo's use of them in St. Peter's). He also expresses surprise that this motif – through Perrault's example – has become so widely accepted in the intervening decade: "I am astonished, I say, that they [the architects employing it] have not seen the difference between those ruins that have received universal approbation, and those buildings, half Gothic, on which the ancients coupled columns or pilasters."³⁵

This taint of Gothicism in the bundling of structural supports now emerges as the main issue: "I have nothing to say of that love that he attributes to our nation for daylight and openness, because we can admit at the same time that it still partakes of the Gothic, and in this it is therefore very different from that of the ancients."³⁶ And if Perrault uses Hermogenes to justify his new invention, Blondel insists that the sword has a double edge: "It is also very true that this same reasoning has opened the door at all times to the disorder that is found in architecture and in the other arts." Now he approaches the heart of the matter: "Gothic architects only filled their edifices with such impertinences because they believed that it was permitted to add to the inventions of the Greeks and Romans."³⁷

Blondel's sentiments here seem remarkably doctrinaire and opposed to all innovation, but we should keep in mind that the issue for him carried very high stakes, of which his reputation as an engineer and teacher was not the least. Perrault was nevertheless forced to rejoin, and his initial response – resonating with the Cartesian doubt that imbued his scientific training – took the form of a greatly expanded footnote in the second edition of his translation of Vitruvius, issued in 1684. His reasoning is now quite clever. On the one hand, he argues that a blind adherence to ancient practices would effectively stifle all progress or modern innovation; on the other hand, he proudly admits to the taint of Gothicism:

The principal objection on which he [Blondel] leans the most is founded on prejudice and on the false assumption that it is not permitted to depart from the practices of the ancients; that everything which does not imitate their manners must be either bizarre and capricious, and that if this rule is not inviolably protected, the door is opened to license, which leads the arts into disorder. But just as this reasoning proves too much it cannot prove anything at all, because it is much more disadvantageous to close the door to all beautiful inventions

than to open it to those that are so ridiculous that they will destroy themselves....

But the greatest reproach he believes to make against our Pseudosystyle is to say that it resembles the Gothic. I might hesitate to agree with this fact in my note, but assuming that the Gothic in general (and taking into account everything that composes it) is not the most beautiful style of architecture, I do not think everything in the Gothic must be rejected. The daylight in their buildings, and the openness that results are things in which the Gothic people differed from the ancients, but they are not things for which the Gothic is to be disdained.³⁸

Thus, the issues first defining the architectural debate between the ancients and the moderns were neatly laid out on the table by 1684, but Perrault, with his deeply felt skepticism toward the authority of the classical past, did not stop here. One year before the second edition of Vitruvius appeared, Perrault published his own architectural treatise, *Ordonnance des cinq espèces de colonnes selon la méthode des anciens* (Ordonnance for the five kinds of columns after the method of the ancients), which issued an even more threatening challenge to Blondel's academic teachings.³⁹ It did so ostensibly by raising a problem that Renaissance theory (both in Italy and in France) had been unable to resolve – that of devising a uniform system for the proportioning of columns.

The problem was in fact a long-standing one, as Renaissance architects had recognized. The system proposed by Vitruvius was unacceptable, first because the Roman architect had not provided sufficient details, second because he himself had admitted that the basic proportions for the orders had changed over time, and third because the columns in surviving Roman buildings (mostly from imperial times) did not have the proportions that he prescribed. In searching for a unified system in keeping with the belief in absolute beauty, Renaissance architects from Leon Battista Alberti (1404-72) to Vincenzo Scamozzi (1552-1616) had proposed systems for quantifying dimensions. More recently, in 1650, Fréart de Chambray had taken another approach; he simply compiled the dimensions given by ten authors so that the architect could decide upon the best solution.⁴⁰ Thus, an urgent problem of the newly established Academy of Architecture was to define with precision the system used by Roman architects and so make it available as a guide for modern use.

To this end Colbert sent the student Antoine Desgodetz (1653–1728) to Rome in 1674 with the mission of measuring the principal Roman monuments.⁴¹ The trip proved event-ful from the start, as both Desgodetz and his traveling

companion, Augustin-Charles d'Aviler, were kidnapped by pirates on their way south and had to be ransomed by the crown before they could start work. When Desgodetz eventually returned to Paris in 1677, he brought with him measurements of almost fifty buildings. Twenty-five monuments were chosen to be engraved in a volume published by the crown in 1682, under the title *Les Edifices antiques de Rome dessinés et mesurés très exactement* (The ancient buildings of Rome drawn and measured very exactly).⁴² Yet far from revealing the system used in antiquity, Desgodetz's research rather demonstrated that no common dimensional system prevailed and that the measurements of such renowned Renaissance authors as Serlio and Palladio were filled with inaccuracies when compared with his "very exact" measurements.

Blondel seems not to have cared much for the conclusions of Desgodetz's study (not least because they were inconsistent with his belief in absolute beauty), and it was most certainly Blondel's decision to suppress the results, or at least to keep them from serious examination.⁴³ Perrault, who was also following the events closely, was by contrast intrigued by Desgodetz's findings, and they must have served as a challenge to his scientific mind. Indeed, the first goal of Perrault's Ordonnance was to propose a new system of proportional ratios for the columnar orders, which he devised by working in an empirical fashion. He gathered measurements from buildings and treatises of ancient and modern authors and derived from them the arithmetical mean for each unit of the columns and entablatures - invoking the premise that "good sense" on the part of the architect prescribed the choice of the mean between two extremes.⁴⁴ His system of "probable mean proportions" was also based on an innovation of his, the petit module (a third of the diameter of a column), which allowed the architect to employ simple numbers (instead of fractions) for smaller parts.

Still, it was the theoretical introduction to the Ordonnance that had the most important implications for the debate, for there Perrault seized the opportunity to wrap his earlier objections to Blondel's teachings under a broader theory. In several footnotes to the 1673 edition of Vitruvius, for instance, he had voiced his belief that proportions, far from possessing a "positive, necessary, and convincing beauty," were rather a product of the human mind (*fantasie*), arrived at by "a consensus of architects" based on what they deemed to be the best works to be imitated.⁴⁵ This belief now led him to propose two different types of beauty for architecture: positive and arbitrary. In the first category belong those beauties based on "convincing reasons" easily

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apprehended by everyone, such as "the richness of the materials, the size and magnificence of the building, the precision and cleanness of the execution, and symmetry."⁴⁶ Positive beauty is thus reminiscent of absolute beauty, but only in the sense that its appreciation is universal. Arbitrary beauty, on the other hand, is "determined by our wish to give a definite proportion, shape, or form to things that might well have a different form without being misshapen and that appear agreeable not by reasons within everyone's grasp but merely by custom and the association the mind makes between two things of a different nature."⁴⁷ Here, under the rubric of "affectivity" or "association," is where architectural proportions reside. Thus Perrault's argument presages a relativistic rather than an absolutist aesthetics.⁴⁸

Perrault's distinction between positive and arbitrary beauty also becomes the basis for calling into question other tenets of academic theory. Drawing upon his continuing medical research, for instance, he denounces the notion of shared harmonic values for music and architecture on the grounds that the ear and the eye process perceptual data in different ways. The former works without the mediation of the intellect, while the eye perceives entirely through the intervention of knowledge.⁴⁹ Musicians never differ on the correctness of the notes of a chord, he points out, whereas architects (as the many books with rules for column orders show) almost always hold distinct opinions on proportions. Perrault challenges as well the idea that architectural beauty should be predicated on imitation, either of nature or of reason, and prefers to ground it entirely on habit or custom.⁵⁰ His harshest words - words that also articulate his "modern" position most clearly - are directed against those architects who express an undue reverence for antiquity: "The extent to which architects make a religion of venerating the works they call ancient is inconceivable. They admire everything about them but especially the mystery of proportions."51 Perrault compares this "exaggerated respect" for the past in his day to the "cruel war waged on the sciences" by the barbarism of the Middle Ages, forcing many branches of culture to take refuge in monasteries. Thus his long scientific training obviously stood behind his desire to demystify the foundations of architecture and place its basic tenets on a rigorous rationalist footing.

But this desire was expressed near the time that the architectural debate was drawing to a conclusion. And in the short term at least, Perrault's views would not win many followers. Blondel died in 1686 and his successor, Philippe de la Hire (1640–1718), would leave in place his teachings regarding absolute beauty and proportions. Perrault himself would die in 1688 – conscientious scientist that he was, of an infection incurred while dissecting a camel.

4. The First Project for the Church of Ste.-Geneviève

Even before Claude Perrault passed away, the quarrel between the ancients and the moderns had entered a new phase. The stimulus to the new debate was a poem by Charles Perrault read to the French Academy on 27 January 1687. It was entitled "The Century of Louis the Great," and in it Charles glorified the accomplishments of the age of Louis XIV and the great strides that had been made in the arts over the last quarter-century.⁵² He even went so far as to liken these accomplishments (architectural and otherwise) with the achievements of "the beautiful age of Augustus."

Reactions to such comparisons within the literary world were swift and for a while unrelenting. The classicist Nicolas Boileau-Despréaux got up and walked out of the hall during the reading, by some accounts slamming the door on his way out. He later proceeded to attack the Perrault brothers unmercifully for their cultural conceit, as did other "ancients" within his literary circle, including La Fontaine and Racine.⁵³ Charles, however, was well equipped to respond. After retiring as Colbert's secretary in 1682, he had returned to his literary pursuits (he was well known as the author of fairytales, many of which were collected and published between 1812 and 1815 by the Grimm brothers).⁵⁴ To Boileau he responded with a four-part Socratic dialogue, Parallel of the Ancients and the Moderns, which appeared between 1688 and 1697. Here he greatly expanded his earlier arguments in favor of progress in the arts and sciences and again defended the right of his age to define its own artistic spirit even if this meant going outside of the stylistic confines of the past. In commenting on Charles's rationalist fervor (no doubt also evident in his brother), one nineteenth-century chronicler of the guarrel between the ancients and moderns even referred to him as "the son of Descartes."55

This quarrel, however, was largely a literary affair. Far more important for architectural theory was a brief *mémoire* Charles published in 1697 under the title "Dessin d'un Portail pour l'Église de Sainte-Geneviève a Paris."⁵⁶ This was a proposal that both he and Claude had made in the mid-1670s to enlarge the ancient church Ste.-Geneviève, the patron saint of the city of Paris. The proposed addition had been designed a few years after the appearance of Claude's translation of Vitruvius, and a surviving interior perspec-

tive and elevation recall, in fact, several plates contained in Claude's translation. 57

Two features of the design made it of great interest to the eighteenth century. One was the entrance porch to the church, a freestanding colonnade supporting an uninterrupted flat entablature above. The second was the flat entablature of the interior nave, which is supported on each side by a row of columns, while the ceiling above is vaulted (actually supported by trusses above). The use of freestanding columns in the nave of a basilica, as Perrault would have known from his research, is reminiscent of a few surviving works from late Roman antiquity as well as the early Renaissance, but the practice of using columns in the naves of larger churches had ceased during the Renaissance. Structurally, the weight and lateral thrust of a vaulted ceiling (desired for reasons of fireproofing) demanded the heavier support of more massive piers.

The scheme of the Perrault brothers, like the Louvre colonnade, was structurally daring in its slender proportions, and it no doubt derived from the same argument made in Claude's footnote defending his scheme for the Louvre. The interior daylight allowed by the more slender columns, the Gothic lightness of their appearance, and the openness (*dégagement*) of the floor plan – these were the elements of Gothic architecture that Claude had approved, whatever paradoxes they might pose for classical theory. There is even an internal formal consistency here, as Michel Petzet has suggested: "The more classical church, the church with columns and architraves, is at the same time more Gothic in its structure."⁵⁸

In 1698 work also began on the chapel at Versailles, following the design made almost a decade earlier by Jules Hardouin-Mansart (1646-1708).⁵⁹ The chapel presented a unique architectural problem in that the royal pew was to be on the second level whereas the lower level was reserved for less important members of the king's retinue. Matching the height of the narrow chapel with the existing elevations of Versailles also mandated a vertical solution.⁶⁰ Hardouin-Mansart's design was ingenious: He created a twopart scheme that featured a low range of piers at ground level and a taller colonnade of freestanding Corinthian columns above, supporting a straight entablature and vaulted ceiling (of wood and stucco). The daylight pouring through the upper-story windows behind the columns, contrasting with the darkened spaces below, accentuate this royal division. Various historians have commented on the Gothic feeling of this classical chapel, with its slender columns reinforced with iron bars and chains buried in the architraves -

not to mention the flying buttresses outside. Wherever Hardouin-Mansart found the inspiration for his light and elegant design, it perfectly reflects the innovative mind of Claude Perrault.

Hardouin-Mansart's design also falls in with another historical development then taking place. When Perrault traveled to Bordeaux in 1669, he made mention of the l'ordre gothique, which he contrasted in the same sentence with the l'ordre antique. He was therefore making a stylistic distinction between Gothic and classical architecture that was in one respect new to seventeenth-century France. It is not that Gothic architecture was unknown or unstudied at this time; rather, the converse is closer to the truth. As Robin Middleton has noted, the Gothic building tradition and its guilds remained strong in French secular and ecclesiastical circles throughout the sixteenth and seventeenth centuries.⁶¹ The first major proponent of Italian Renaissance taste, Philibert de L'Orme (1515?-70), in fact devoted several chapters of Le premier tome de l'architecture (The first book of architecture; 1567) to Gothic vaulting techniques.⁶² Various guidebooks and building studies in the last part of the sixteenth century discussed in some detail the medieval monuments of France. And by the early seventeenth century, various authors, among them André Duschesne and François Derand, not only had a sophisticated appreciation of Gothic formal and structural characteristics but stressed the "elegance," "delicacy," and "lightness" of Gothic structural solutions.⁶³ What Perrault's stylistic distinction suggested - aside from granting Gothic architecture a certain credibility as a style was that classical architecture might indeed be enriched by a better understanding of the formal and structural techniques of Gothic buildings.

This point was not entirely lost on the Academy of Architecture. Blondel himself, though fiercely opposed to the forms and ornaments of Gothic architecture, had (with his engineering background) some appreciation for the constructional aspects of Gothic works. Still, when the Academy of Architecture began to read de L'Orme's treatise in 1676, it skipped over his analyses of Gothic structures and began with the books 5, dealing with the classical orders.⁶⁴ Two years later, at the request of Colbert, members of the Academy of Architecture made several field trips in and around Paris to study the properties and deteriorating stonework of medieval churches.⁶⁵ Aside from visiting such Parisian works as Notre-Dame, architects and students ventured to Saint Denis, Rouen, and Chartres.

The Gothic style was given another measure of legitimacy a decade later, in 1687, when Jean-François Félibien