Introduction

We begin with two weekend houses, the Villa Rotonda by the Italian Renaissance architect Andrea Palladio (1508–80) and the Y-House by the contemporary American architect Steven Holl (b. 1947) (Figures 1 and 2). Built more than four centuries apart – the Villa Rotonda was completed over more than twenty-five years from 1565 to 1592,[1] while the Y-House was completed much more quickly, in 1999 – the two houses could not look more different. The older building, constructed like all of Palladio's work out of stucco-covered brick, is a liberal transformation of an ancient temple – the Pantheon in Rome built by the Emperor Hadrian and dedicated around 126 CE – into a private home for which there is no known antecedent in antiquity. Its remarkable geometry begins with an interior rotonda surrounded by rectangular rooms within a perfect square set within an imaginary circle. The circumference of this circle passes through the centerpoint of the porticos before each of the four matched faces of the house, and each of the porticos has six Ionic columns supporting a triangular pediment crowned with statuary. Similar statues crown the walls that flank the broad flights of steps leading from the ground to the porticos and the main level of the house. The Y-House, by contrast, is an asymmetrical version of the letter, with a short stem and two arms of unequal length, as different from Palladio's symmetrical plan as could be. Sheathed in horizontal tongue-and-groove wood

siding painted barn-red, it has all-glass walls at the ends of the two arms of the Y and small windows asymmetrically placed on the other walls of the house. The first house is unmistakably from the Italian Renaissance, the other unmistakably from the turn of the twenty-first century.

There are other differences between them, which reflect further differences between the periods in which they were built: the Villa Rotonda stands atop a small hill a short distance outside of the contemporaneous city limits of the northern Italian city of Vicenza where Palladio did much of his work, and it could be easily reached from the town on foot or by horse or wagon; while the Y-House is located several hours north of New York City with a vista of the Catskill Mountains, but is easily reached by the ubiquitous modern means of transportation – the car. No doubt there are socio-economic differences between the owners as well: the one house built by wealthy Italian gentlemen, their wealth coming from the Church or the land; the other built for a contemporary upper-middle-class nuclear family, their wealth coming from some contemporary business or profession, with corresponding differences in use, the one originally used for weekend gatherings with other wealthy magnates, the later house no doubt being primarily used for family weekend or summer vacation retreats from the usual routine of work and school, perhaps with occasional visits from other family members or close friends.[2]

Nevertheless, beneath the superficial differences between these two buildings there are deeper similarities. I picked two examples of the same building type: the secondary home intended to be used for weekends or

vacations. (I chose the Villa Rotonda because, unlike many of Palladio's other villas, it was not the headquarters of a working farm, flanked by wings for agricultural equipment and produce.) This means that there must be some similarities in the way the buildings were or are used despite all the socio-economic and cultural differences between sixteenth-century Vicenza and twentieth- and twenty-first-century New York state. Both houses were meant for pleasant retreats from the city. Both houses are situated to afford their residents pleasant vistas of nature and easy access to it. Both houses take best advantage of their sites: the Villa Rotonda is rotated 45 degrees from a straight north–south axis (or, since it is a square within a circle, a straight north–south–east–west orientation) so that every room will be lit by the sun at some point in the day; the Y-House has its largest glass areas facing northeast to get the best view while also minimizing excessive glare and solar gain. Holl's description of the experience of light in the Y-House is just as valid for the Villa Rotonda: "The slow passing of time from early morning to sunset is to be a primary experience in the house as different areas of the house become activated by the movement of the sun."[3] Both houses have a well-defined distinction between public and private spaces: The central rotonda and largest rooms of the Villa Rotonda served for the entertainment of larger groups, while the smaller rooms would have afforded more private spaces for sleeping or dining without guests. The public living and dining spaces of the Y-House and its bedrooms are separated on the two levels of the two arms of the Y. And so on.

But beneath this there is an even deeper level of similarity. First, although the building materials and technologies of Renaissance Italy and contemporary North America are certainly different, both architects exploited the technologies available to them as best they could: Palladio using brick, stone, stucco and plaster, and advances in the construction of domes to create the remarkable interior spaces and external facades, porticoes, and steps of the building; Holl using large sheets of glass unavailable centuries earlier but also steel and concrete to create the open entrance hall of the house, and contemporary heating, ventilation, and air-conditioning (HVAC) equipment, lighting, wiring, and more. Both architects were no doubt trying to accommodate the needs expressed or assumed by the owners for relaxing, entertaining, sleeping, and cooking (although in the Villa Rotonda this would not have been done by the owners and in the Y-House probably is), although certainly the owners' conceptions of their needs – the programs for the houses, in architects' terminology – would have been discussed with the architect and modified and refined as the plans were developed. And certainly in both cases the architects were concerned with how the houses would look, from outside and inside, from closer and further away, at different times of day and night, and during different seasons of the year, perhaps seen as one physical object in a larger landscape but also as an image in a woodcut or engraving or photograph. Both architects would have been concerned with how the materials of the house would feel, what would be smooth and what rough, how conversation, laughter, and music would sound in or among the rooms of the house, and more.

In other words, both the Renaissance and the contemporary architects would have been concerned with how their structures would be built, how they would be used, and how they would be experienced.

The argument of this book will be that for all the changes over the years and centuries in architectural technologies and styles and in cultural and socio-economic conditions, at the most abstract level the core goals and values of architecture have not changed. Architects have always been and will continue to be concerned with how and how well their buildings can be and are built, how well they serve the needs of the client, and how pleasing, engaging, and/or interesting the experience of the building will be for its audience, which may include owners, other users, and those who may simply see their buildings, whether on foot, from cars or other vehicles, or through images in various media from prints to photos to computer screens. These three fundamental goals were identified in the oldest surviving treatise on architecture in the Western canon, the *Ten Books on Architecture* by Marcus Vitruvius Pollio (ca. 70–20 BCE). Vitruvius stated that all buildings "must be executed in such a way as to take account of durability, utility, and beauty" (*firmitas*, *utilitas*, and *venustas*), or, as in another translation, "durability, convenience, and beauty."[4] Works of architecture are structures that are built to please us by both their utility or convenience and their appearance (in the broadest possible sense, appealing not only to sight but to our other senses as well). And they are to be built out of sound and enduring materials put together well so that they can accomplish the first two goals,

typically for a long time although sometimes architects are called upon to design structures such as platforms for special events and pavilions for expositions that must be safe but are not intended to last. Here Vitruvius's three Latin terms will be translated as good construction, functionality, and aesthetic appeal. These are not literal translations, but they will be used to stress the generality of these goals. As available materials and structural technologies, as ways of life and therefore conceptions of appropriate uses thereof, and as aesthetic expectations – what might be found beautiful or grand or exciting – have varied radically through history, the general values of good construction, functionality, and aesthetic appeal remain constant. Likewise, as more particular architectural theories, for example the view that elements of construction should be masked by surfaces covered with painting and sculpture, gave way to the view that aesthetic appeal should be achieved by construction alone, for instance by the exposure of steelwork or the imprint of the wooden forms used in pouring concrete, those general values remain valid. I will argue this here by looking at a sample of philosophical treatments of architecture, architectural theories, and actual buildings from antiquity to the present, concluding with a glimpse into the future.

Three comments before I start. First, it is easy to get confused about the extreme generality of the Vitruvian categories, or, to put the point another away, it is easy to get confused about the difference between philosophy of architecture and architectural theory. For example, the architectural historian Kenneth Frampton has written that the analysis of architecture by the nineteenth-century

architect and theorist Gottfried Semper (1803–79) in terms of four elements – namely hearth (heat-source), earthwork (elevation above the ground and therefore protection from water, animals, and other humans), a framework/roof (and therefore protection from sun and rain), and an enclosing membrane (and therefore privacy) – "represent[s] a fundamental break with the Vitruvian triad of *utilitas*, *firmitas*, [and] *venustas*."[5] No, Semper's list of the elements of architecture does not conflict with the Vitruvian goals of good construction, utility, and aesthetic appeal; rather it specifies the basic *parts* of buildings *by means of which* they must realize both their functionality and their beauty and which therefore must be well-designed and built for those goals to be achieved in an enduring way – for example a hearth must be well-designed and built of good stone or brick in order to both draw well and look good for a long time. Semper's architectural theory operates one level down from the Vitruvian ideals, or is a theory of the means to the Vitruvian ends. Frampton, who conceives of "tectonics" as the "poetics of construction," is particularly interested in the modernist ideal of achieving beauty through structure rather than by surface materials or ornamentation, but this does not deny the importance of aesthetic appeal as one of the fundamental aims of architecture to be achieved, along with functionality, through interesting as well as good construction. One of the subjects of Frampton's work is the nineteenth-century British ecclesiastical architect Augustus Welby Northmore Pugin (1812–52). Frampton cites Pugin as stating "First, that there should be no features about a building which are not necessary for convenience,

construction or propriety; second, that all ornament should consist of the enrichment of the essential construction of the building."[6] But again it is a mistake for him to then describe Pugin as "Anti-Vitruvian and anti-utilitarian to the same degree."[7] Pugin was hardly opposed to utility or functionality, since he explicitly made "convenience and propriety" necessary conditions for architecture, where propriety can itself be understood as the appearance of a building's suitability for its intended use, thus as part of its utility. But neither was he opposed to beauty: he just thought that ornament should come from the "essential construction" of the building, not from something more superficial. In other words, Pugin thought that both utility and aesthetic appeal should be achieved *through* good construction: he accepted the Vitruvian ideals, but had a particular view of how they should be realized.

Second, my argument is not that the three goals of good construction, functionality, and aesthetic appeal *define* architecture; they apply to any of the arts or technologies that human beings have developed to fulfill our practical needs – *technai* in the original Greek sense.[8] If we take the traditional list of basic human needs – food, clothing, and shelter – the Vitruvian goals apply to those too. We want our food to be nourishing, of course, that is, functional; but also appealing in both taste and appearance, that is, aesthetically appealing; and to be properly prepared – washed, salted, cooked, etc. – to be safe to be consumed now or later, in other words to be well-made. We want our clothing to be functional, whether that be concealing or revealing, depending on the occasion on which it is to be worn – warm

or cool depending on the season; to be attractive, although fashion and therefore what counts as attractive may change quickly or slowly; and to be made of good materials and well-constructed, although again what will count as satisfying that goal will vary with the intended function of the garment – a party dress may not have to be constructed to last but must be in fashion, while a coat or shoes may have to transcend current fashion fads but be well-made out of enduring materials. In all these cases, the goals of good construction, functionality, and aesthetic appeal will have to be met in some way. Architecture specifically might be defined, as for example by John Ruskin (1819–1900), as "the art which so disposes and adorns the edifices raised by man, for whatsoever uses, that the sight of them may contribute to his mental health, power, and pleasure."[9] Then it is the reference to edifices raised by human beings that distinguishes architecture from other arts, whereas the explicit requirements that architecture serve various human uses but also provide aesthetic pleasure, and the underlying assumption that its products should be adequately designed and constructed to serve these dual purposes, are something that architecture shares with the other arts.[10] That architecture concerns the construction, function, and aesthetics of human structures may be taken as the definition of the discipline, while the statement that architecture aims at the *good* construction, *successful* function, and aesthetic *appeal* applies general norms, ideals, or values of human artifice to the case of architecture.

Third, in order to realize the Vitruvian ideals architecture need not be restricted to a specific list of building

types, such as private residences (the examples with which I began), or places of public gathering such as temples, courts, markets, and theaters. Obviously the list of building types with which architects might be concerned has changed over the ages. Vitruvius himself did not discuss office parks and airports, nor are city walls or temples a large part of any architect's practice today.[11] But sometimes people draw a distinction between purely functional structures, which can be left to engineers, and genuine architecture, which aims at more than mere functionality; indeed, the nineteenth-century philosopher Arthur Schopenhauer (1788–1860) went so far as to assert that insofar as architecture makes "provision for useful purposes" it is not a fine art at all.[12] We will come back to his claim later (see p. 74). The point now is that even if we do make a distinction between purely functional structures of engineering and works of genuine architecture that aim at some kind of aesthetic appeal as well as functionality, this distinction would not correspond to any neat division of building types; any structure can count as a work of architecture if it aims at aesthetic appeal as well as functionality. One celebrated work by the contemporary architect Annabelle Selldorf (b. 1960) is the Sunset Park Material Recovery Facility (2013), "a processing center for New York City's curbside metal, glass and plastic recyclables undertaken by Sims Municipal Recycling and the City of New York" (the clients) on the Brooklyn waterfront (Figure 3). Perhaps many recycling facilities and trash transfer stations are designed solely by civil engineers, and no doubt there were civil engineers involved in Selldorf's project. But the "master plan," which includes "a tipping