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The Staircase

History and Theories

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PREFACE

The architect who does not conceive of a staircase as something fantastic is not an artist.

—Gio Ponti

Architects, all idiots; they always forget to put in the stairs.

—Gustave Flaubert

Stairs, ladders, and ramps entered the thesaurus of building components in prehistoric times. Yet even the earliest known and simplest demonstrations are still constructed today. As new variations have developed, these have been absorbed into the vocabulary, usually without displacing other models. The fundamental prosthetic nature of stairs encourages this conceptual longevity, as well as constant rebirth and replication. This functional destiny is so circumscribed by the boundaries imposed by human physical dimensions and gait that the quintessential geometry of the stair has changed more in response to shifting aesthetic, architectonic, and cultural goals than from theoretical or empirical refinement.

The staircase can be as treacherous as well as a beautiful siren, with many facets to its complex overt nature. Historically, the great theoreticians of architecture have recognized the many faces of the staircase, and their treatises evidence a concern for the comfort and safety of those who use

stairs. Curiously, the major texts that comprise the history of architectural theory have comparatively little to say about the stair as an aesthetic element. In fact the normative rules for beauty that are typical of so much of the writings of architectural theorists are conspicuously absent from the seminal texts that treat stairs. Many of the great architect-theorists from Vitruvius to Alberti to Blondel and after have thought and written about stairs (and their ideas are discussed in these two volumes). In their writings they treat stairs as architectural elements to be thought of in terms of *firmitas*, *utilitas*, and *venustas*; order, arrangement, eurythmy, symmetry, propriety, and economy. They think of stairs as the veins and arteries of buildings (Vasari, Scamozzi); as objects of beauty (Palladio); as symbolic (Alberti, Martini, Palladio); as places of danger (Vitruvius, Palladio, Guadet); as places where one should be concerned about the needs of the elderly and infirm (Palladio); about the necessity for good illumination (Vitruvius, Palladio); about the behavior of people on stairs (Leonardo, Palladio); they pontificate about the dimensions of risers and treads, the steepness of staircases, and so on. They also sense that one can think of the stair in some holistic fashion—as both subject and object, as architectural piece and as architecture.

Nineteenth- and twentieth-century specialization has acted to erase or shadow this synoptic view of architecture. For some, today, architecture is essentially engineering (firmness). For others it is function and finance (commodity). For some, it is all and only delight. Some writers suggest that this conceptual minimalization and disintegration of architecture is the inevitable

consequence of the scientizing of thought products arising from the philosophies formulated in the Enlightenment and ultimately transposed into materialistic positivism. This position strikes me as romantic, at least, and historically selective and revisionary. It is a curiously materialistic dismissal of the Tao of knowledge. By definition, neither science nor art narrows our learning, even if our views become selective. We alone set our intellectual boundaries. To equate science (but not art, for some reason) with materialism is to equate the spiritual, in the humanistic sense, with the unknown and to give ignorance the status of nobility. This is to glorify a limited and limiting view.

The first chapter of Michel Foucault's *Archaeology of the Human Sciences* (1973) uses Velasquez's painting *Las Meninas* as an archaeological icon to be comprehended only by stripping it of its many layers of meaning. Without understanding the historical moment, the customs of the court, the painter's philosophy (and privileges) and our own, and the roles played by the now mute faces, as he shows us, this painting represents little more than its own dust cover.

Similarly, without a history (in the medical sense), the staircase, chameleonlike, disguises itself to match the interests of the viewer; it is art object, structural idea, manifestation of pomp and manners, behavioral setting, controller of our gait, political icon, legal prescription, poetic fancy, or the locus of an epidemic of cruel and injurious falls. Each disguise is a fragment of its nature that reveals a character but still leaves its essence concealed or fragmentary. To be seduced by only one or two of its masks is to miss the whole play

of meanings, contexts, and potentialities. It is this partial vision that limits our understanding and inevitable judgments about architecture and building and the elements from which we compose them, leading us, on the one hand, to a mechanistic, insensitive, soulless, and ugly world that claims to be well engineered (in a narrow sense), and, on the other hand, to a world that claims to be poetic, attuned to the ganglia of the human spirit, but remains ignorant of or even disdains the human sciences that can make our art humane, sensitive to our cultures, our differences, our fallibility and imperfections.

Specialization has given us a depth of understanding but threatens our comprehension. Each specialist in our world of design is dismayed that so little of his or her field is held in esteem. Architecture, some say, is form or formal dialectic. It is indecipherable without revealing its social, economic, and political intention, others demand. To the homeless, architecture may be stripped to its functions as building, shelter, and climatic modification. Humanity is still the measure (but not humanity as experience), say others. Without revealing the philosophical theories, architecture is simply a vacuous craft, some insist. And they are all right, in part.

The position I have taken in these two companion volumes is comfortably with Palladio and his followers. It seems fruitless to try to understand architecture, or a piece of architecture, from a single vantage point. That would be to have a partial view (in every sense). The stair offers an extraordinary opportunity to try the opposite approach. To apprehend it, one can probe it from many directions, like the black box of systems theory; and under-

standing the stair means more than a systematic collation; it is a sharpening of the senses and sensibilities. There have been many books that deal with stair construction and a few that deal with stair history. Some design pattern books and standard professional reference books include stair design criteria (usually quite removed from current knowledge). There is also an extensive literature that reveals something of the nature of the stair as one of the most dangerous manufactured objects. But there has been no book that scrutinizes steps and stairs vectorially in this way. In fact, even books and articles on stair history are largely limited to certain periods and certain countries; there is no adequate perspective view.

The evolution of the stair (and the ladder and the ramp) catalyzed human exploration and exploitation of architectural space. Spatial potentials demanded the invention of the stair, and the stair made possible quite new configurations and dispositions. Much later, the elevator (and the escalator) stimulated an explosion of vertical spatial experimentation and expansion into strata that lay well beyond the useful limits of stair access. But stairs were not superseded and rendered obsolete by these mechanical systems. Stairs have, of course, been retained as the backup system—a role that is no less important because it is supportive. The stair becomes the route of last resort where the potential for catastrophe demands a design that will always be safe and convenient. As often as not, these stairs are treated as a necessary nuisance and built to the minimum that codes will permit, with low levels of comfort, convenience, and ambient quality. And people are reluctant to use them, even for trips between adjoining floors. The resulting lack of activity

sometimes transforms them into the ideal locus for criminal activity (Newman 1972). But the stair is an important architectural and architectonic element, still fascinating to designers.

In view of the continuing prevalence of stairs, their very ancient lineage, their glory as an architectural piece, and their dark side as places of great danger, it is remarkable that so little attention has been paid to them until recently; and there is still much to do. A lack of a system of design principles has obliged designers to make assumptions or to guess at what constitutes a stair that is safe, comfortable, and convenient. Even if all the rules of thumb, the design guidelines currently in use, and the extant safety and building codes are followed, the results may still be dangerously unsafe.

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The Staircase attempts to remedy some of these omissions. These companion volumes describe investigations that probe many of the seemingly most important questions, and they suggest ways of considering others. This first volume (*History and Theories*) explores what can be deduced from the stair's past and the theories of design that were influential. The second volume (*Studies of Hazards, Falls, and Safer Design*) is concerned with the physical, physiological, and behavioral interaction between people and these Euclidian stair geometries. It is concerned with what we must expect from stairs and what we must do to control the stair's other, crueler nature, and it discusses quite a new idea, the soft stair, that may be able to reduce substantially the annual toll of deaths and serious injuries. Finally, the second volume sets out all the factors to consider when designing a stair. At our peril, we can continue to rely on archaic

formulas, rules of thumb, a good eye, and experience; the published literature and the emerging research is too extensive and diffuse for most practitioners to keep up with. To put the information into practical form, the appendix to the second volume takes the designer through the affective factors and suggests ways to make design decisions. There are others—those concerned with code development or litigation, for example—who require a much more thorough discussion. For them, the rest of the second volume provides an introduction to current knowledge. These two volumes are an attempt to try to understand an element of architecture from many viewpoints: from the scientific, the cultural, the historical, the fanciful, the fearful, the behavioral, the biomechanical, the legal; the safe, the unsafe, the hard, the soft, stairs for comfort, stairs to astonish, minimal stairs, stunning stairs.