

ARCHITECT AND ENGINEER: A STUDY IN SIBLING RIVALRY

ANDREW SAINT

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In 1923, in *Vers une Architecture* Le Corbusier fired a salvo across the bows of the architectural profession. Claiming that ‘the styles are a lie,’ he pilloried traditional architects, but extolled engineers who ‘employ a mathematical calculation which derives from natural law’ and whose works ‘give us a sense of harmony.’ Two decades later in *Space, Time and Architecture*, Siegfried Giedion presented the designers of the *Palais des Machines* at the 1889 International Exhibition in Paris, as noble harbingers of modern building, while condemning the Beaux-Arts architects of the 1893 World’s Columbian Exposition in Chicago.

We observe the split personality of St. Pancras Station in London whose Gothic Revival façade by George Gilbert Scott’s conceals W. H. Barlow’s revolutionary iron train shed. But how much do we know about the relationship between architect and engineer on this or any other project? Do we recognize the other people who contributed to them? Andrew Saint is the first to attempt comprehensive coverage of the subject. His *Architect and Engineer: a Study in Sibling Rivalry* is an ambitious work. He has unearthed many stories that give us a fuller picture of the ways that two professions worked in harmony or in discord. Furthermore he has deftly tied them together with comment and analysis.

The book began as a series of lectures at the Cambridge University School of Architecture and has retained its original organization. The first chapter, “Imperial works and Worthy Kings”, deals with the official architecture of France and England, and more briefly, America. The second, “Iron” and the third, “Concrete,” focus on the exploitation of these materials over a larger span of time. The fourth, “The Bridge,” concerns a building type, while the fifth entitled “Reconciliation,” describes partnerships between engineers and architects in the 20th century. The sixth tackles the education of architects and Engineers. Thus each chapter is an independent essay.

I believe that the book should have opened with a brief historical summary going back at least to the Middle Ages when master masons controlled both design and construction. A clear explanation of the contrast between the Renaissance architects Brunelleschi and Alberti could also have laid some essential groundwork. The example of the sixteenth century Ottoman architect Mimar Sinan, who rose from military engineer to chief architect of the sultan would also have been an appropriate addition. His mastery of space, light and structure shows his fusion of engineering and architecture.

Saint’s inquiry begins, however, in seventeenth century France where, under the control Jean-Baptiste Colbert, three diverging paths developed. The Génie, responsible for fortifications and military engineering; the Ponts et Chaussées dealing with bridges and highways and a range of public projects, while the Bâtiments du Roi oversaw the monarch’s personal buildings. A stronger division came with the founding of the Ecole Polytechnique in 1795.

In England the field of architecture was dominated by Wren, whom Saint describes more as an engineer than an architect. It seems to me odd that Saint devotes much of his discussion of Wren's work to his occasional use of iron and does not even mention his major concept for the dome of St. Paul's. Wren's decision to create an inner dome in scale with the interior, and an outer dome rising high above the City, with a brick cone between the two supporting the lantern, shows the artistic and scholarly Wren posing problems for the engineer Wren to solve.

The chapter on iron is fascinating. In many case studies we see the transition from the early nineteenth century when foundrymen and fabricators found technical solutions for architects to the 1860s when architects consulted civil engineers. We can compare buildings like the Houses of Parliament in London, with iron structures entirely concealed, and Labrouste's Bibliotheque Ste. Geneviève in Paris with its daringly exposed iron. We learn many intriguing facts, for example that The Royal Engineers ran a school of architecture and took the lead in the design of the Natural History Museum and the Royal Albert Hall; that the Eiffel Tower was actually designed by Eiffel's *chef d'études* Maurice Koechlin and greatly modified by the architect Stephen Sauvestre. In the curious case of the Oxford Museum, Saint effectively discusses the issues concerning the relationship between iron and Gothic ornament that aroused the critics of the day. Equally, at the end of the chapter, Saint enlightens the reader on the partnership of Adler and Sullivan.

Next, we learn about the emergence of concrete, around 1890 particularly with the example of François Hennebique's system and worldwide organization. His projects ranged from an ornate Indo-Cambodian villa in Egypt to sleek factories. Hennebique's rival Cottancin produced a different reinforced cement system that inspired Anatole de Baudot, then seeking to apply Viollet-le Duc's philosophy to church design. The subsequent construction of St. Jean de Montmartre was fraught with disaster. The next phase is illustrated in the work of the Perret brothers, Freyssinet and Albert Kahn. The discussion continues brilliantly with such projects as Frank Lloyd Wright's Unity Temple and Imperial Hotel, Owen Williams's Boots Building and Le Corbusier's Pessac housing.

In "Reconciliation" Saint provides a series of vivid case studies from the twentieth century. They demonstrate how 'high class architects and engineers have learned to work intimately if quixotically together, spurring one another on in the grail of innovation.' Often the process is stormy and is characterized by arrogance and obstinacy between brilliant bursts of problem solving. The relationship between Jørn Utzon and Ove Arup, as they tried to solve the dilemmas of the Sidney opera house, seems like a pivoting point of the book. The long and tense association between Louis Kahn and August Kommandent is well told.

In conclusion, Saint's aims to answer three questions: Were architects and engineers once the same? How and why did architect and engineer separate? Have the professions reconciled? He concedes that the answers tend to undermine the questions. But he has provided readers with enough material to continue the debate. This is a book to which I will return many times.