

Cambridge University Press

978-0-521-12369-3 - French Architects and Engineers: In the Age of Enlightenment

Antoine Picon

Frontmatter

[More information](#)

The professions of architect and engineer, which had maintained very close links since the time of the Renaissance, became increasingly isolated from one another in France during the course of the eighteenth century, the Age of Enlightenment. This book analyses the meaning of this gradual mutual isolation, the consequences of which can still be felt today at a variety of different levels, and offers a unique insight in English into the teaching and practice of architects such as Jacques-François Blondel and Pierre Patte, and engineers such as Jean-Rodolphe Perronet and Gaspard Riche de Prony.

The architects and engineers who form the core of Picon's thesis are major figures in the history of French architecture, on whom very little can be found in English. The special interest of the battle between the architects and the engineers, particularly at the Ecole des Ponts et Chaussées, and the eventual victory of the engineers, can be seen in terms of the gradual replacement of the ideals of the *Ancien Régime* by those of nineteenth-century rationalism. The issues raised are central to eighteenth-century thought, including nature and reason, Newtonian science, the *Philosophes* and the *Encyclopédistes*. Picon also describes the centrality of the new interest in the town, and the debate over the construction of the church of Sainte-Geneviève (the Panthéon) which encapsulated many of the issues in the struggle between the architects and the engineers.

The text of the book is clear and easily comprehensible, and presents a fully accessible account of this key period in the development of architectural achievement and debate. It will also shed light on the current debate on the appropriate form for modern buildings, as well as offering a full survey of the social, technical and aesthetic representations of a profession that was undergoing rapid and permanent transformation.

Cambridge University Press

978-0-521-12369-3 - French Architects and Engineers: In the Age of Enlightenment

Antoine Picon

Frontmatter

[More information](#)

CAMBRIDGE STUDIES IN THE  
HISTORY OF ARCHITECTURE

*Edited by*

ROBIN MIDDLETON

*Professor of Art History, Columbia University*

JOSEPH RYKWERT

*Paul Philippe Cret Professor of Architecture,  
University of Philadelphia*

and DAVID WATKIN

*Lecturer in the History of Art, University of Cambridge  
and Fellow of Peterhouse*

This is a new series of historical studies intended to embrace a wide chronological range, from antiquity to the twentieth century, and to become a natural counterpart to Cambridge Studies in the History of Art. Volumes in the series are intended primarily for professional historians of architecture and their students, but it is also intended to include a number of volumes for course work or of interest to the general reader.

Cambridge University Press

978-0-521-12369-3 - French Architects and Engineers: In the Age of Enlightenment

Antoine Picon

Frontmatter

[More information](#)

---

CAMBRIDGE STUDIES IN THE  
HISTORY OF ARCHITECTURE

FRENCH ARCHITECTS AND ENGINEERS  
IN THE AGE OF ENLIGHTENMENT

Cambridge University Press

978-0-521-12369-3 - French Architects and Engineers: In the Age of Enlightenment

Antoine Picon

Frontmatter

[More information](#)

# FRENCH ARCHITECTS AND ENGINEERS

IN THE AGE OF ENLIGHTENMENT



ANTOINE PICON

TRANSLATED BY

MARTIN THOM



**CAMBRIDGE**  
UNIVERSITY PRESS

Cambridge University Press  
 978-0-521-12369-3 - French Architects and Engineers: In the Age of Enlightenment  
 Antoine Picon  
 Frontmatter  
[More information](#)

CAMBRIDGE UNIVERSITY PRESS  
 Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore,  
 São Paulo, Delhi, Dubai, Tokyo

Cambridge University Press  
 The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

[www.cambridge.org](http://www.cambridge.org)  
 Information on this title: [www.cambridge.org/9780521123693](http://www.cambridge.org/9780521123693)

French edition © Parenthèses, Marseilles, 1988  
 English translation © Cambridge University Press 1992

This publication is in copyright. Subject to statutory exception  
 and to the provisions of relevant collective licensing agreements,  
 no reproduction of any part may take place without the written  
 permission of Cambridge University Press.

Originally published in French as  
*Architectes et ingénieurs au siècle des lumières*  
 by Parenthèses, Marseilles, 1988

First published in English by Cambridge University Press as  
*French architects and engineers in the Age of Enlightenment* 1992  
 This digitally printed version 2009

*A catalogue record for this publication is available from the British Library*

*Library of Congress Cataloguing in Publication data*

Picon, Antoine.  
 [Architectes et ingénieurs au siècle des Lumières. English]  
 French architects and engineers in the Age of Enlightenment/  
 Antoine Picon: translated by Martin Thom.  
 p. cm. – (Cambridge studies in the history of architecture)  
 Translation of: Architectes et ingénieurs au siècle des Lumières.  
 Includes bibliographical references and index.

ISBN 0 521 38253 X

1. Neoclassicism (Architecture) – France. 2. Architecture–  
 Philosophy. 3. Engineering – Philosophy. France – Intellectual  
 life – 18th century. I. Title. II. Series.

NA1046.5.N4P513 1991

720.'944'09033–dc20 90–23827 CIP

ISBN 978-0-521-38253-3 Hardback

ISBN 978-0-521-12369-3 Paperback

Cambridge University Press has no responsibility for the persistence or  
 accuracy of URLs for external or third-party internet websites referred to in  
 this publication, and does not guarantee that any content on such websites is,  
 or will remain, accurate or appropriate.

## CONTENTS

	<i>List of figures</i>	<i>page</i> ix
	<i>Acknowledgements</i>	xiv
	Introduction	1
1	GENERAL REMARKS	7
2	THE CLASSICAL TRADITION AND ITS AMBIGUITIES	16
3	THE IMPACT OF THE ENLIGHTENMENT ON ARCHITECTURE	35
4	'TOWARDS A CLASSICAL ARCHITECTURE': JACQUES-FRANÇOIS BLONDEL AND THE 'COURS D'ARCHITECTURE'	47
5	THE ENGINEERS' 'SYSTEM'	99
6	THE PRINCIPLES OF TRAINING AND THE ECONOMY OF KNOWLEDGE	121
7	STABILITY AND CONSTRUCTION	140

## CONTENTS

8	PIERRE PATTE AND THE CONCEPT OF THE RATIONAL TOWN	186
9	A PRODUCTIVE COUNTRYSIDE	211
10	FROM THE REVOLUTIONARY 'GENIUS' TO NEO-CLASSICISM	256
	CONCLUSION	335
	APPENDIX. BIOGRAPHICAL NOTES	340
	<i>Notes</i>	354
	<i>Index</i>	426

## FIGURES

1	C.-A. d'Aviler, <i>Cours d'architecture</i> (1691, second edition 1720), Ionic capital.	page 21
2	C.-A. d'Aviler, 'Mouldings'.	24
3	C.-A. d'Aviler, frontispiece of the <i>Cours d'architecture</i> , which contained 'a full explanation in alphabetic order of all the terms' used in the art of building.	25
4	C. Perrault, <i>Ordonnance</i> (1683) the five orders of architecture in arithmetical progression.	29
5	J.-A. Nollet, <i>Lettres sur l'électricité</i> (1753–67), experiments in electrostatics.	37
6	D. Leroy, <i>Les ruines des plus beaux monuments de la Grèce</i> (1758), a hypothetical reconstruction of the Propylaea.	43
7	D. Leroy, <i>Histoire de la disposition et des formes différentes que les chrétiens ont données à leurs temples</i> (1764, second edition 1770), parallel between ancient and modern temples.	45
8	C.-A. d'Aviler, 'Tabulated architectural system'.	53
9	J.-F. Blondel, <i>Cours d'architecture</i> (1771–7), 'Palladio's Tuscan entablature'.	55
10	J.-F. Blondel, 'Vignola's Tuscan entablature'.	57
11	J.-F. Blondel, 'Liberties and abuses in architecture, relating to the use of pilasters and columns in the decoration of buildings'.	58
12	J.-F. Blondel, 'Proportion of balustrades'.	59
13	J.-F. Blondel, 'Central features of one of the façades of the interior of the courtyard of the old Louvre, on the rue Fromenteau side'.	63
14	J.-F. Blondel, 'Central features of the château of Maisons on the garden front'.	65



## FIGURES

15	J.-F. Blondel, 'Façade of the Palace of Duke Mattei, built according to the plans of Charles Maderne'.	67
16, 17	J.-F. Blondel, sections of a monastic abbey church, from the author's own drawings.	71
18, 19	J.-F. Blondel, plan and cross-section of the royal abbey of Saint-Louis at Metz.	73
20, 21	J.-F. Blondel, elevations of a 'Palace with a frontage of sixty-six <i>toises</i> '.	74
22	J.-F. Blondel, 'Central feature of the façade of the Louvre colonnade'.	77
23	J.-F. Blondel, 'Design for the great central feature of the Louvre colonnade'.	77
24	J.-F. Blondel, 'Amphitheatres'.	80
25	J.-F. Blondel, 'Site plan for the buildings and gardens of a grand hunting-lodge projected in Germany for the Elector of . . . '.	81
26	J.-F. Blondel, 'Site plan for the buildings and gardens of a magnificent château projected for Germany'.	81
27	J.-F. Blondel, 'Various designs for complex palisades, serving to decorate ceremonial gardens'.	82
28, 29	J.-F. Blondel, plans for the ground floor of a 'Palace with a frontage of sixty-six <i>toises</i> '.	86
30	J.-F. Blondel, detailed arrangement of an apartment in the abbot's house of the Abbey des Prémontrés at Villers-Cotterets.	88
31	D. de Carré, medallion depicting Peronnet.	103
32	Dumont, church projected for the competition of 1755, first prize, sketch of the façade.	115
33	B. de Seuré, project for a sepulchral chapel for the competition of 1781, elevation.	116
34	J.-L.-H. L'Escaille, arsenal projected for the competition of 1780, plan.	117
35	J.-L.-H. L'Escaille, projected arsenal, elevation of the main façade.	118
36	Bas-relief in the antique style for the figure-drawing competition, end of the eighteenth century.	124
37	'Entablature which may be seen in the garden of the Palazzo Colonna at Rome', end of the eighteenth century.	125
38	Acanthus leaf for the ornamental drawing competition, end of the eighteenth century.	126
39	L.-J. Desprez, the <i>Ecole des Ponts et Chaussées</i> , end of the eighteenth century, detail, Musée Carnavalet, pen and ink.	127
40	G. Riche de Prony, <i>Plan d'instruction</i> , Year VII, 'Synoptic table of a course of construction'.	138
41	P. Patte, <i>Cours d'architecture</i> (1777), 'Façade of a house built of stone'.	143
42	P. Patte, <i>Mémoires</i> (1769), 'Construction of the flat vaults and ceilings of the Louvre colonnade'.	144

## FIGURES

43	P. Patte, two designs for the façade of the great portico of Sevandoni's Saint-Sulpice.	145
44	A.-J.-B. Rondelet, <i>Traité théorique et pratique de l'art de bâtir</i> (1802–17), different kinds of masonry, ancient and modern.	147
45	A.-J.-B. Rondelet, machine for testing the resistance of stone.	149
46	C. Espagnol, projected road near Montmartre for the competition of Year VI, first prize, sections of the road and embankments, detail.	152
47	Design for a stone bridge between the Ile Saint-Louis and the Ile de la Cité, for the competition of 1792.	154
48	H. Gautier, <i>Traité des ponts</i> (1716, second edition of 1765), frontispiece.	157
49	E.-M. Gauthey, <i>Œuvres</i> (1806–9), various profiles of piers, together with the flow of water produced in each case.	158
50	P. Patte, machine for cutting piles under water.	161
51, 52	J.-R. Perronet, <i>Description</i> (1782–3), pont de Neuilly and pont Sainte-Maxence, 'basket-handle arches' and 'stretched arches'.	162–3
53, 54	J.-R. Perronet, pont de Neuilly and pont Sainte-Maxence.	164–5
55	J.-R. Perronet, works at the pont de Neuilly, draining the waters in order to lay the foundations for a pier.	167
56	J.-R. Perronet, installation of cocked centres.	169
57	J.-R. Perronet, work at the pont de Neuilly in 1770 and 1771.	170
58	J.-R. Perronet, pont Louis XVI.	172
59	G. Riche de Prony, <i>Nouvelle architecture hydraulique</i> (1790–6), simple machines, the vice, the wedge, and their use in the theory of arches.	175
60	J.-R. Perronet, <i>Mémoire sur la recherche des moyens . . . pour construire de grandes arches de pierre</i> (1793).	176
61	P. Patte, <i>Mémoire sur la construction de la coupole projetée pour couronner la nouvelle église de Sainte-Geneviève à Paris</i> (1770), plans and sections of the dome of Sainte-Geneviève.	177
62	P. Patte, 'Plans of the piers of the principal domes set alongside, so as to demonstrate the inadequacy of those designed to bear the dome of Sainte-Geneviève'.	179
63	C.-A. d'Aviler, different examples of stonecutting.	183
64	J.-F. Blondel, 'Block outlines of the new buildings and new ways of building at Metz since 1764'.	191
65	J.-F. Blondel, 'Block outlines of some of the new buildings and new ways of building at Strasburg from 1767 onwards'.	193
66	P. Patte, <i>Monumens</i> (1765), 'Part of a general plan for Paris, illustrating the different sites proposed for an equestrian statue of the King'.	195
67, 68	P. Patte, <i>Mémoires</i> , plan and section of a street.	199
69	N. Le Payen, project for a military port in the bay of Cherbourg, for the competition of Year IX, first prize.	202
70	Simon, project for a headrace for the 1756 competition, site plan.	208

## FIGURES

71	'Ideal map with a blue knot', a map for the 1784 competition.	213
72	'Trompe l'œil with butterflies', map for the 1793 competition.	214
73	'Trompe l'œil with the Knave of Spades and the King of Diamonds', map for the 1792 competition.	215
74	Map for a competition at the end of the eighteenth century.	216
75	Brulé, map study intended to serve as a model for the pupils at the <i>Ponts et Chaussées</i> , 1793.	218
76	Outlines of trees for maps, 1793.	221
77	'Study of woods for maps', 1793.	222
78	Kirn, map study, 1792.	225
79	Debret, map study, Year II.	226
80	Map for a competition at the end of the eighteenth century.	228
81	P.-C. Lesage, map study, 1775.	230
82	Dubois, map for the 1793 competition.	232
83	Map for a competition, end of the eighteenth century.	234
84	Map for a competition, end of the eighteenth century.	237
85	M. Cormier, project for a stone bridge for the 1791 competition, second prize.	238
86	P.-C. Lesage, <i>Recueil de divers mémoires</i> (1806–10), Smeaton's Eddystone Lighthouse.	241
87	View of 'the temple of Jupiter Serapis' at Pozzuoli for the landscape drawing competition of 1784.	242
88	<i>Encyclopédie</i> , cross-section of a mine.	245
89	G. Brémontier, canal project at summit level, drawing exercise set at the <i>Ecole Polytechnique</i> .	246
90	G. Riche de Prony, <i>Atlas des Marais Pontins</i> (1822), map of the marshlands.	249
91	G. Riche de Prony, bridge project.	251
92	C.-F. Volney, <i>Les ruines</i> (1791), frontispiece.	258
93	L.-F. Cassas, <i>Voyage pittoresque de la Syrie, de la Phénicie, de la Palestine et de la Basse-Egypte</i> (1799 and subsequently), 'Mausoleums located at the head of the valley leading to Palmyra'.	259
94	L.-F. Cassas, 'Mausoleum of Iamblichus'.	261
95	L.-J. Desprez, crypt and tombs, late eighteenth century.	264
96	C.-N. Ledoux, <i>L'Architecture</i> (1804), 'Elevation of the cemetery of the town of Chauv'.	267
97	C.-N. Ledoux, cemetery of the town of Chauv.	269
98	C.-N. Ledoux, 'House of the directors of the Loüe'.	275
99	C.-N. Ledoux, 'The poor man's shelter'.	279
100	C.-N. Ledoux, 'Perspective view of the town of Chauv'.	281
101	C.-N. Ledoux, 'Assembly house'.	283
102	C.-N. Ledoux, 'Map of the surroundings of the Chauv saltworks'.	287
103	M.-A. Laugier, <i>Essai sur l'architecture</i> (1753), frontispiece.	289
104	A.-J.-B. Rondelet, 'Lintels of the French Panthéon'.	291

## FIGURES

105	A.-J.-B. Rondelet, 'Ruin of a wall built of small tufa stones, near to the Metella tower at Rome'.	293
106	C.-F. Mandar, <i>Détails de construction d'une maison</i> (1818), perspective view.	296
107, 108	C.-F. Mandar, details of the porch of the house, seen from below and in cross-section.	298–9
109	N. Thouret du Breuil, project for a museum and for four academies for the 1786 competition.	301
110	N. Thouret du Breuil, project for a museum and for four academies, elevation.	302
111	J.-L. Carbon, stock exchange project for the 1788 competition.	303
112	R.-J. Haüy, <i>Traité élémentaire de physique</i> (1803), form of crystals.	305
113	C.-N. Ledoux, 'Perspective view of Loûe bridge'.	311
114	B.-F. de Bélidor, <i>Architecture hydraulique</i> (1737–9, republished in 1782), frontispiece.	315
115	G. Riche de Prony, <i>Nouvelle architecture hydraulique</i> , the various motors: animal, human, steam.	317
116	G. Riche de Prony, steam engine at Chaillot.	319
117	Dumousseau, project for a steam engine for the 1790 competition, first prize.	320
118	J.-N.-L. Durand, <i>Précis</i> (1802–5, republished 1817–19), 'The whole series of the Orders'.	323
119	J.-N.-L. Durand, different courtyards.	324
120	J.-N.-L. Durand, 'Series of buildings resulting from various horizontal and vertical combinations'.	325
121	J.-N.-L. Durand, 'Course to follow in the design of any project whatsoever'.	327
122	J.-J. Winckelmann, <i>Histoire de l'art chez les anciens</i> (1764, translated into French 1790–2), colossus of Memnon.	329

## ACKNOWLEDGEMENTS

I owe much to the works of Bruno Fortier, Jacques Guillerme, Monique Mosser and Werner Szambien on classicism, the Enlightenment and neo-classicism. Bernard Haumont has helped me to clarify certain aspects of the professional debate between architects and engineers. Bénédicte Leclerc was kind enough to put the results of his study of Jacques-François Blondel's work at Strasburg at my disposal. Jean-Pierre Epron showed me his notes on the Academy of Architecture. Philippe Duboy, François Véry and Michel Vernes also supplied me with much information. Philippe Gresset and Pierre Saddy were kind enough to read through the manuscript, while Jean-Louis Cohen has proved an unfailing source of support, his advice proving of particular value on more than one occasion. Finally, I wish to thank the Centre Pédagogique de Documentation et de Communication de l'Ecole Nationale des Ponts et Chaussées, and Jean Michel and Michel Yvon in particular, for their help.