

Notes

Part I: The Social Uses of Drawing: Drawing and Architectural Practice

1. There are numerous books about drawing in general. The most complete is that by Rawson (1987). Lambert (1984) has written an informative introduction to the subject.

A most interesting collection of articles about architectural representation and collection of drawings can be found in Blau and Kaufman (1989). For a most edifying discussion of architectural drawing as a form of seeing and acting, see Evans (1989). Analyses of drawings as pure conceptions of architectural practice can be found in Zukowsky and Saliga (1982) and Gebhard and Nevins (1977). Works with similar perspectives but which also deal briefly with the social and technical role of architectural drawing can be found in O'Gorman (1989 and 1986). Porter's (1979) is a useful overview of the uses of architectural drawing. An earlier and important discussion of architectural drawing as an art can be found in Blomfield (1912).

There are numerous works dealing with the techniques of architectural drawing; see for example Ching (1985). Hulse (1952) traces the history of these techniques and their impact on architecture.

The works on the history of drawing in architecture are too numerous to mention here, but a good beginning can be had with Cable's bibliography (1978) of works on architectural drawing.

2. Bakhtin (1986):7.

3. For opposing views on the role of the image in primitive society up to today, see Gombrich (1960) and Goodman (1976).

4. From Gerhard of Brugge's *An Introduction to the General Art of Drawing* (1684), quoted in Lambert (1984):9.
5. Williams (1976):76. For a more complete discussion of the meanings and implications of culture, see his *The Long Revolution* (1961).
6. Williams (1976):243.
7. Bauman (1973):176.
8. For elucidating discussions of the complex and often conflictive relationship between society and culture, see De Certeau (1984), Bourdieu (1977), Harvey (1989), and Lipsitz (1990).
9. For a discussion that deals with many of the issues suggested here, see Baxandall's (1972) discussion of the relationship between the cultural and social production of painting in fifteenth-century Italy.
10. Evans (1986):7.
11. See his *Mythologies* (1972), especially the opening remarks.
12. See for example Blau (1984), Gutman (1988), Sarfatti Larson (1983), Saint (1983), and Cuff (1991).
13. Eisenstein (1979):1:24.
14. See Kostof (1977b) for a more detailed discussion of Egyptian architecture.
15. Coulton (1977):16.
16. Kostof (1977b):12.
17. J. A. Bundgaard, *Mnesicles: A Greek Architect at Work*, cited in Kostof (1977b):14.
18. Kostof (1977b):15.
19. Haselberger (1985):130.
20. See McDonald (1977).
21. Quoted in McDonald (1977):40. While Euclidean geometry makes use of drawing, Vitruvius appears to be distinguishing between drawing and geometry, as this passage makes clear.
22. Quoted in Harvey (1972):190.
23. Shelby (1977):142.
24. Shelby (1964):391.
25. Branner (1958):15.
26. Bucher (1968):65.
27. Branner (1958).
28. See Toker (1985).
29. Toker (1985):67.
30. See Harvey (1972) for the historical and textual evidence of this new split. There is some question about the early rise of the architect in the modern sense. Hollingsworth (1984) argues that while drawing did allow for the separation of the design idea

from design realization, it did not immediately lead to the creation of what would become the modern architect. Toker (1985) is not entirely in disagreement with Hollingsworth but does believe that the groundwork for the drawing as the idea and the architect as mental worker producing the idea was developing as early as the fourteenth century.

31. Toker (1985):87.

32. See Bourke (1964):135: "For this is that unchangeable Truth which is rightly called the law of all arts and the art of the omnipotent Artisan."

33. Cited from Alberti's *De re aedificatoria* in Toker (1985):80.

34. Manetti (1970):96.

35. Quoted in Blunt (1962):55.

36. See Toker (1985):80–89, especially footnotes 44–48, for a discussion of this transition in the use of drawing.

37. See Lotz (1977) for a discussion of the developments in drawing in the Renaissance. Also see *Daidalos* 1 (1981) for a series of articles that discuss the relation of drawing and concept in architecture from various perspectives.

38. For an overview of the importance of printing in the intellectual and social transformation of Europe and the making of new classes of mind workers, see Eisenstein (1979), especially volume 1.

39. Quoted in Onians (1988):173.

40. Wilkinson (1977) offers an expanded discussion of these issues. For a more complete discussion of the design and building of the Escorial see Kubler (1982).

41. Quoted in Onians (1988):173.

42. The letter is included in Pedretti (1962):162–171. Until recently, the letter had been attributed to da Vinci. For a list of texts on architecture from this period see Wilkinson (1977). A more detailed listing of early works on drawing can be found in Cable (1978).

43. Jenkins (1961):20.

44. As this is only a brief excursion into the history of architectural drawing and its uses, an excursion taken to demonstrate the important link between the distinct position of the architect and its relation to drawing, it would be too much to delineate here all the changes in types and forms of drawing that were developed over the next four centuries. There is as yet no one book that provides a complete technical history of architectural drawing; one can put a reasonable picture together by reading the various sources cited throughout this essay.

45. Dostoglu (1982):126.

46. The development of CAD systems has not as yet replaced traditional modes of discourse in architecture. Some observers believe that its impact will be small whether it does or not, because they believe that CAD systems are merely a continuation of drawing with a new and more powerful instrument. Others would argue the opposite, that CAD systems offering wholly new logics

and modes of discourse will constitute whole new ways of thinking about architecture. If the former is true then the role of drawing in architecture will not substantially change culturally or socially. If the latter is true then both cultural and social relations in architecture may undergo substantial change. In either case, the issue of the relationship between the social construction of architecture and its modes of discourse will remain. For differing views on the subject, see Mitchell (1990) and Bruegmann (1989).

47. For examples of such work see Collins (1979).

48. There are a number of interesting books that offer a much fuller discussion of the technical aspects of drawing. A most accessible discussion can be found in Porter (1991). Cooper (1983) provides a very complete discussion of the various drawing approaches available to architects, as do Powell and Leatherbarrow (1982). For a more technical discussion of drawing techniques and geometries see Dubery and Willats (1983).

49. See *Daidalos* 13 (1985), especially the article by Silveti, for a discussion of perspective.

50. Porter (1991):96. The concept of paraline drawing is from Porter.

51. For such views see Cooper (1983):92–99.

52. Cooper (1983):80. For more detailed views of such drawings see *ibid.*, pp. 80–87.

53. Kayser and O'Neill (1984).

54. Kolb (1990):108. For another elucidating view on the

issue of drawing, architecture, and language see Evans [1986]. Bloomer [1993] offers a different reading of the relation of text to architecture.

55. A most illuminating discussion of the changing ways of seeing architecture, as well as understanding and evaluating its meaning and worth, may be found in Bonta (1979).

56. For other discussions of architecture and language see Broadbent (1980) and Jencks and Baird (1969).

57. For a discussion of the problem of ambiguity in the drawn image see Goodman (1976). A discussion of the multiplicity of ways of seeing drawing may be found in Lambert (1984).

58. Godzich (1986):xx.

59. Nesbit (1991).

60. Mitchell (1986):37. Mitchell's work offers an incisive discussion of theories of the image and what they imply.

61. Frampton (1991):21.

62. For a discussion of the relation of drawing to technological inventions, see Hulse (1952).

63. It is important to note here that for most architects, thinking, seeing, and drawing are only analytical categories and not necessarily what the architect experiences. The experience may be an all-at-the-same-time phenomenon. See Rowe (1987) for a discussion of the many iterations that design goes through at conception and the different ways architect work through their designs.

64. Graves (1977):387.
65. See Burns (1982) and Hirst (1988), especially chapter 9.
66. See *Daidalos* 13 (1985).
67. See Bakhtin (1981).
68. Blau (1984) and Gutman (1988) discuss the various ways in which architects may define their practices.
69. Goodman (1976).
70. A few architects do involve engineers and others earlier during the conceptual stages of design, but this is not that common.
71. Harvey Bryant, personal communication.
72. Le Corbusier's notebooks (1981) are a famous and well-documented example.
73. See Robbins (1988).
74. Jenkins (1961) has a quite complete discussion of this shift in England.
75. Quoted in Onians (1988):174. Onians offers a most useful discussion of the role of drawing in the work of Francesco di Giorgio and the place of drawing as a critical aspect of the new architecture of the Renaissance.
76. I would like to thank Holly Gretch for pointing out the inherently rhetorical nature of architectural drawing.
77. See Lipstadt (1989).
78. Quoted in Frampton (1991):21.
79. Goldthwaite (1980) provides a useful discussion of the social hierarchies in the making of building in fourteenth-century Florence.
80. For a discussion of how this form of appropriation works, see Robbins (1988).
81. See Lambert (1984); Blau and Kaufman (1989), especially the article by R. Evans and the catalogue section of the book; Gebhard and Nevins (1977); O'Gorman (1986 and 1989); Porter (1991); *Daidalos* 1 (1981) and 5 (1982); and the articles in Akin and Weinal (1982), especially the articles by Graves, Chimacoff, and Silveti, for discussions of the power of drawing as tool of representation and thinking. Also see Ames-Lewis (1981) for an important and intriguing discussion of drawing and what new possibilities it opened up for Renaissance artists in general.
82. Some observers would see these new emphases and the weight they place on personal autonomy as a statement of architecture's powerlessness, and the new and greater emphasis placed on representation a sign of architecture's weakness. For such an argument see Crawford (1991).
83. For an example see Chicago Tribune (1923).
84. See for example Lipstadt (1989) on the drawing as a culturally critical mode for competitions and within architectural discourse in periodicals. See also O'Gorman et al. (1986), Gebhard and Nevins (1977), and Zukowsky and Saliga (1982) for discussions of the drawing as the pure representation of the architectural

idea and O’Gorman (1986) for an argument that, while drawing plays many roles in architecture, it best defines the architect’s contribution because the building represents a compromised work. Also see Pierce (1967).

85. For one view of how drawing limits architectural creativity, see the interview with Peter Rice in part II.

86. Sohn-Rethel (1978):203. See especially his discussion of the development of the split between manual and intellectual labor and its relation to commodity exchange.

87. Graves (1977):393–394. It is important to note here that this article by Graves was the one most highly and most often recommended to me by architects when I discussed my project with them.

88. Quoted in Onians (1988):172.

89. For a discussion of the relation of agenda setting to power and control, see Lukes (1986).

90. I say specifically “architecture” here because it is clear that the word is used in two ways. One way is to speak of all building as “architecture,” in which case the architect’s role is not particularly significant, given the low percentage of all building that is designed by architects. The other way is to speak of “architecture” as well-designed, important, or monumental building, most of which it may be argued falls within the bailiwick of the architect as both the designer who produces such buildings and the critic who decides which buildings merit such designation.

91. Encyclopedia Britannica (1911).

Notes

Part II: Why Architects Draw

1. Quotes in the section discussing particular drawings are from Robin Nicholson, who was the project architect and was closest to the entire design process according to Cullinan.

2. *Daidalos* 13 (1985).

3. In quoting Siza, I have allowed some of the unique grammatical and syntactical constructions to remain. Though English is not his first language, his answers are often quite eloquent even if not prescriptively proper.

The interview was held in two places. The first part of the interview was held in Cambridge with Siza and an associate, Peter Testa, who at times during the interview commented on his own experiences in working with Siza. A visit to Siza’s office in Porto offered the opportunity to complete the interview with Siza.

4. The interview with Hasegawa took place while she was visiting Harvard University; it was conducted through a translator, Hiroshi Nashimura.

5. Some of the grammatical constructions in this interview are the result of Moneo’s use of English as a second language. Most often I have allowed the constructions to stand in order to allow Moneo’s voice to come through.

6. See Pedretti (1962):155–172.

7. See Benjamin (1969). For a discussion of Benjamin and his notions of seeing and consumption, see Buck-Morss (1989).

8. Peter Rice died while this book was being completed. Within the interview, the text has been kept in the present tense.

9. For another discussion of the museum, see the narrative of his drawings by Renzo Piano, above.

10. For examples of the drawing type Rice is speaking about, see the work of Zaha Hadid (1993).

Part III: Drawing and Architectural Practice Revisited

1. In Sarfatti Larson (1993):4.

2. Becker (1982) offers an illuminating discussion of the problems and conflicts involved in the social making of art.

