developments can be detected in the arts (conceptual art, for example, flour-ished in the 1970s). Architects were interested in concepts such as the "memory of the site" (Grumbach 1979); this was not easily representable within existing conventions and architects sought to expand them. Unlike their Modernist predecessors of the 1920s, the postmodernists did not invent new representational means but took new liberties with existing ones. For example, they revived the use of axonometric drawings and stretched them to the limits of coherent expression. The office of Stirling and Wilford started making "worm's-eye" (up-view) drawings; in these drawings only selected ele-ments of the designed building were shown – just enough to document an overriding idea, a central concept. A good example is the publication in major European architectural magazines of three competition entries for museums in Germany by Stirling and Wilford, between 1975 and 1977. In addition to many such "axos," and even more surprising for contemporary readers, these
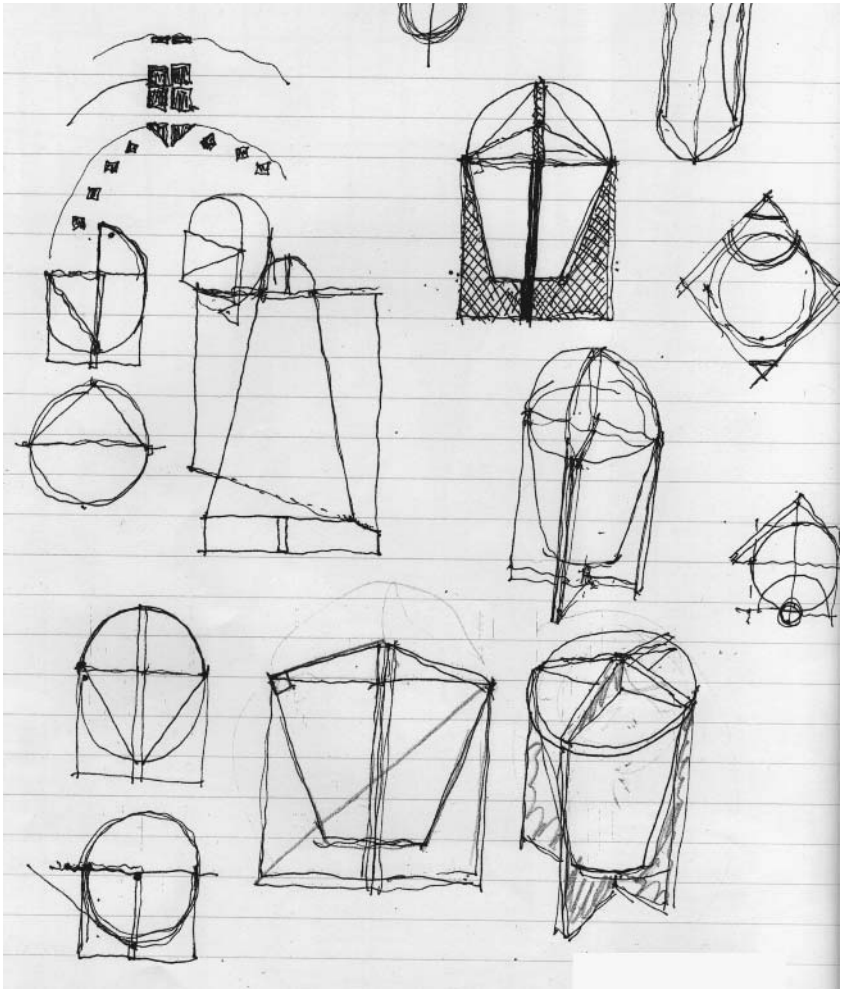

Figure 9.4 Charles Gwathmey, published sketches for a coffee-pot, 1990 (from Tapert 1990, p. 52). Reproduced with the permission of Charles Gwathmey and Rizzoli International.

publications also included a large number of small preliminary sketches (see Chapter 2). Architects have, of course, been making sketches in abundance for centuries, but very rarely have they been published, especially as competition entries. Stirling pioneered a practice that has since become very common – the publication of rough preliminary sketches. These sketches, which had until then been private, have become part of the projected public image of a work of design and even somewhat of a trademark of the designer, and we find them in design and architectural publications as of the second half of the 1970s. Figure 9.3 shows an excerpt from Eisenman's sketches for "Houses of Cards." In a book he published on the theme (Eisenman 1986), a 44-page chapter is devoted entirely to sketches; many of them, as well as hard-line drawings elsewhere in the book, are axonometric views. Figure 9.4 reproduces sketches by Gwathmey for a coffee-pot, made on a lined writing-pad sheet. These sketches, too, were deemed appropriate for book publication (Tapert 1990). It is hardly imaginable that both these images would have found their way to print even two decades earlier.

In later years attempts were made to use idiosyncratic design notations (e.g., Tschumi, Libeskind, Hadid), completely divorced from habitual drawing conventions, in order to communicate ideas of pluralism, ambiguity, and lack of conventional order. To date these attempts have not (yet) won wide acceptance. Once a new major cultural wave again swipes at our shores, we may expect fresh attempts at representational innovations, developed to cater to novel needs of the new cultural values and priorities of their age.

Technology and Media

That the state of technological development and the media used are pertinent to design representation seems obvious. We might want to remind ourselves that, prior to the 15th century, drawings were made on surfaces such as parchment and vellum, which were expensive and therefore used with great discretion and economy. The practice of freehand exploratory sketches does not begin until after the "paper revolution" made paper of good quality and reasonable price readily available. Industrial production of good quality paper at affordable prices was the consequence of the opening of printing presses, after the invention of the movable printing type. The first printing press opened in Rome in 1467 and paper was, since then, produced industrially to satisfy the rapidly growing demand of the printing presses. Artists were fast to discover the outstanding advantages of paper for their purposes and became ardent consumers of this old-new medium, primarily for explorative sketching (see Figure 9.1), which was well suited to the innovative spirit of the Renaissance.

Further technological advances that had a great impact on representational capacities were the introduction of semi-transparent paper, and the invention of light-sensitive chemically treated paper, used for "blue-prints" and, of course, in photography.[1] Translucent tracing paper once again enhanced the practice of sketching, thereby contributing to the private aspect of representation. In contrast, photographs and prints have changed the way designs are communicated publicly, be it for technical purposes (blue prints) or as artistic interpretations of works of design, for which photography is frequently employed. With the advent of computers and various modelling, drawing, and