Drawing in the Pac-Man Era

by Jeff Telgarsky

Some members of the RAIC got together in June at the Ritz-Carlton in Montreal to talk about compouters and their effect on architecture in Canada. It may seem early to be judging the impact of the computer in architectural practice, considering that SOM only installed their first plotter line six years ago. However, the world of computers, swathed in its jargon and working with a speed and complexity which can barely be grasped, seems to hold little respect for the languid pace architects normally follow in dealing with innovation. Now, in 1983, SOM has computers in ten of its offices around North America and is currently embarked on a programme to carry out a total reorganisation and expansion of its computer network. The questions naturally arise: How do architects, who took hundreds of years to move beyond the T-square, cope with this revolution in the practice? What impact is this going to have on the 'art' of architecture?

The question of time is no longer relevant. Computers have penetrated deep into every aspect of present living (this magazine is computer typeset and even this article was written on a word processing facility) and it is clear there is no revolution against these machines in the offing. The fostering of an entire generation that has lived with *Pac-man* and *Space Invaders* at the arcade and an

Layout: by the author

Apple in the dining room means that the 'illiterates' cannot merely close their eyes and pretend the computer doesn't exist. The six-year old who invents his own video games and balances the family budget for his beleaguered father is no longer the stuff of science fiction writers; he lives in California.

How to react to the computer is a problem which has generated much discussion in many fields. Yet, it should not be surprising to find that architects take particularly polarised stances on the question. As an 'art', architecture is very wary of the limiations and depersonalisation that use of the computer might engender. On the other hand, architecture is still a 'business' where severe competition and budgets demand efficiency and speed. The controversy between these two viewpoints result from both parties being unable to see the advantages and limitations that the computer carries with it.

Those who are against the use of the computer voice concern for the decline of civilisation, the trend toward depersonalisation and lack of social responsability in today's society, and rightly so. The fault in their argument against computers is that they ascribe the decline to technology. The flaw lies not with the technology but with who uses it and the ends to which it is used. Even of greater concern is their apparent belief that Man, as creator, cannot control his own creations. To resign oneself to such a pessimistic attitude toward human capabilities is very ironic for a group who, for the most part, harken back to the nostalgic days of the eighteenth and nineteenth centuries, the time when the groundwork for today's technological juggernaut was laid.

This group also puts forth the argument that the computer leads to the situation where the user becomes a slave to the machine. They point to the day when the last architect who could draw passes away unnoticed by the 'architects' incapable of functioning away from their keyboards. The misconception here is that the computer 'draws' in the same manner that an architect draws, starting with a blank piece of paper, then progressing, making decisions, until the drawing is complete and the building is created. The computer is only a tool, just like a set square or a lead holder, which helps the user construct the drawing. The computer cannot evaluate decisions made by the user on a semantic or compositional level. It can see logical or factual errors, such as conflicts between structure and services, though.

Finally, those against the use of the computer point out that it is an essentially sterile, unemotional manner of drawing. This, however, illustrates one of the main reasons why architects should not succumb to the master-slave syndrome that afflict other computer users. The computer will never replace the spontaneous sketch with a 6B pencil on tracing paper that is the germ of an architectural concept. The act of drawing is a necessary one for all architects because it reflects the personal struggle of materialising an abstract idea.

This leads one to the other end of the spectrum, to those who see the computer as the solution to every problem. The computer produces drawings at a much greater speed and with greater accuracy than the human draughtsman. It also can work twenty-four hours a day and almost never gets sick, so it cuts production costs, an important attribute in the present hard economic period. There is almost nothing, with enough hardware and software, that the computer cannot do — as long as you tell it exactly what to do. And therein lies the danger of this 'gee-whiz' approach.

The catch-phrase that is being tossed about, quite erroneously, is that the computer has 'artificial intelligence', that it can make decisions. This is true today only for very specific, limited laboratory situations and usually relies on brute force computing, 'number-crunching', where the computer evaluates a large number of alternatives and their results. A computer can play a good game of chess by looking farther ahead than its opponent. However, it can't hope to deal with the myriad complexities involved in the design process, where many, many alternatives are evaluated in terms of criteria that are that are not always possible to describe. A computer cannot be described as 'intelligent' just because it can draw a perspective. The amount of intelligence required by a computer to draw a perspective is zero, because the perspective is just a mathematical and geometric representation of the particular composition created by the architect.

The other factor that this approach neglects, in its quest for greater efficiency, is the human cost, which undeniably exists. Computers reduce the number of people required to do the same amount of work, work which is often tedious and prone to constant change, such as the production of working drawings. The idea of rescuing people from this kind of work appears altruistic, but if the rescue leaves them out on the street, unemployed with an obsolete skill, are they really better off? The danger in this case is that the time and money saved on the production of working drawings is just transferred to the profit column, instead of increasing the participation of office members in the design portion of the process, in an attempt to produce better buildings that still meet budgets.

In responding to the growing role of computers in architecture, both sides seem to neglect one salient point: the computer is a tool, whose value depends entirely on the manner in which it is employed. The role of the computer is an evaluative one, acting as an instrument that allows the architect to look at accurate construction of his design without the task physically drawing new drawings for each further view. This is the crux of the development of the use of the computer in the field of architecture. At present, most of the programs developed for computer graphics are designed for engineering applications which are not nearly as complex or sophisticated as those needed in architectural situations. This, however, is beginning to change as more flexible and comprehensive programs are developed.

Further, the computer allows different people to share more information with greater ease. There no longer exists a single copy of a drawing upon which only one person can work at a time. Anyone can see in seconds what someone else is doing and respond accordingly; communication is practically inevitable. The computer does the 'labour' of drawing repeated elements, leaving more time to consider the form and composition of those elements.

In consideration of these arguments, it would seem that the computer has a positive role to play in the future of architecture. However, it is quite wrong to assume that computers will help create better architects. In fact, there is a very real danger that the opposite will occur if the use of the computer is not approached in a serious and careful manner. The skill of the architect and the quality of his designs are related strongly to the talent and judgement that he has developed. The computer makes the motions of design easier; if there is no architectural basis to the design, the computer performs regardless. In effect, the computer makes it easier for less scrupulous practitioner to churn out his work and it is this torrent of mediocrity that one must be cautious of. Indeed, this is the main reason those who believe in the 'art' of architecture must learn to deal with the computer. If they refuse, it is inevitable that economic pressures will create an even greater flood of the mediocre.

Douglas Cardinal, one of the greatest Canadian proponents of the use of the computer in architectural practice and a speaker at the RAIC Convention, stated that "chiselling graphite onto paper is like writing specifications with a quill pen; it is time to put the architect on par with the secretary." Architects must realise that the computer need not lead to the demise of the 'art' of architecture, as long as the computer is given its proper role. Creativity cannot rest in the machine; it lies only in the hand that controls the machine.

Jeff Telgarsky has recently completed his studies at the McGill University School of Architecture and is a member of the Editorial Board of THE FIFTH COLUMN.