those two worlds came into each other’s orbit for the first time.

From his work came the fundamental precepts on which several filmmaking techniques are based. For example, the special effects achieved though motion control photography are based on Whitney Sr.’s principle of incremental drift. His research also led directly to classic film sequences like Kubrick’s slit-scan “Stargate” in 2001: A Space Odyssey. A generation after this work began, we’re still exploring the connections between the worlds of the movies and computers.

It is really not surprising that the science of computer animation has drawn on the talents of Hollywood, when you consider that there’s a tremendous body of visual knowledge accumulated among people from film and video backgrounds. Their concern has always been how to make things look right, to mimic or model the phenomena of the physical world.

Science to art to science
What may seem ironic is that computer science has allied with Hollywood’s image makers to make a tool that will be sold back to scientists and engineers. But the power of this industry lies in the fact that problems solved for one marketplace will ultimately be useful in other applications. The equations that relate performance to cost in making images for entertainment and advertising are likely to hold true in the scientific and engineering communities as well.

The synergy among these arts and sciences is growing in important ways. Today’s technical innovators are now providing the creative people with a tool they need to expand on their contributions to computer animation—a user interface that does not encumber the creative process. One of the distinguishing characteristics of second-generation CGI companies will be workstations that allow a designer the easiest possible contact with the computer. Interaction with any machine, whether it’s a camera or a computer, should not be a barrier to creative manipulation.

Mutual benefit
When this barrier falls, I believe that a new kind of creative interaction will take place, which will benefit the field immensely. As live-action filmmakers become comfortable enough to use this tool, they will use it very effectively, since they already know, for example, how to light and stage scenes for maximum impact. Filmmakers who come from the tradition of cel animation will also use it well, since they understand how to create visual effects by manipulating physical gestures. These talents will provide a future creative wellspring for the computer animation business.

That will be essential, since all the technical imagination in the world will not produce effective computer character animation without visual and storytelling creativity. The great story ideas that will emerge during this generation will justify the kind of full animation that will move us all forward. But we cannot count on that happening anytime soon.

We have to live in the present, with all the attendant fears about the costs and complexities of computer-generated images. The education of the marketplace about our product must be ongoing, but at the same time we must meet its current time and budget constraints. If that means working beneath what we see as our potential, so be it. However limited we may think the current TV cartoon standards are, for example, we have to work first at that standard, if we are to demonstrate that computerized character animation is an affordable way to go. And if we are fortunate enough to be associated with a successful project, I believe that will pave the way for doing more sophisticated imagery in the future. When the standard begins to rise in this area of programming, it will also rise in others.

But to be a leader, we still have to prove that computer character animation can work at whichever level a client requires. This will hold true in other forms of episodic television, and advertising as well. But I think it is just a matter of time before we see a validation of computerized character animation in a big way.

Quality
One of the spin-offs will be an improvement in the quality of computer animation in other areas. The “comfort factor” that the buyers have in engaging this tool will improve because of a reputation for on-time and on-budget delivery.

To earn that reputation, second-generation CGI companies are being constructed in a much more streamlined fashion than their predecessors. They are learning from the mistakes that decimated the ranks of the first-generation companies, and attracting the venture capitalists who would not have dreamed of taking the risks associated with the pioneer companies. (My own personal experience is that being among the first generation in a field is not necessarily the greatest, unless you survive to be among the second generation!)

It is now incumbent on second-generation companies to nurture that growth, and achieve the kind of practical productivity that will open doors. Remember, such a new field will never hold still in our lifetimes, and we must keep adapting to the markets for our product. Fortunately, the potential subject matter for computer simulations continues to grow at a great rate. It is as big as the potential subject matter for a camera...limitless.

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