

Breaking Out of their Cels

by Karen Mazurkewich

This page: Oscar-nominee *the end* by Alias/Wavefront demo artist Chris Landreth.

Opposite page: Image courtesy of Dan Krech Productions, using Side Effects software for a Duracell commercial.





They called themselves raster-blasters—the superheros of the animation world. They were the guys who eschewed vector graphics and wrote their own rendering programs. And if they had a team uniform, it would most probably have sported the Maple Leaf. That's because the first top guns of the morph and the make-believe were Canadian.

The term raster-blaster has gone the way of the Tyrannosaurus Rex because good rendering programs can now be bought off the shelf. But the new animation kingpins—now termed TDs and supervising animators—working in the top service and production houses still carry Canadian passports. At Industrial Light and Magic (ILM) alone, the company's Canadian team photograph shows no less than 40 players. Pixar, DreamWorks, Sony, Rhythm and Hues, and Disney have also witnessed a quiet invasion of Canucks.

Canadians have played a major role in the evolution of digital imaging. Their dominance in the land of 3-D graphics is due to three factors: software, software and software. To be precise, Alias, Softimage and Side Effects. Three entertainment software packages developed in Canada that are in wide use today. Even Pixar's specialized in-house programs were developed by University of Toronto PhD graduate, Bill Reeves. Steve Williams, Eric Armstrong, Les Major, Dan Philips, James Strauss, Pixar, Robert Coleman and Linda Bel—some of the top “creative” behind the special-effects wizardry in *Jurassic Park*, *Casper*, *The Mask*, *Toy Story*, *Terminator 2*—all started on the early versions of Canadian software. As firms such as ILM bought the software packages, they needed to hire talent to operate and innovate on them. So with the export of technology came the export of animators.

The relationship between software developers and production houses is symbiotic. Steve “Spaz” Williams, a successful demo artist for Alias and later Side Effects Productions (the precursor to Side Effects Software), was snapped up by ILM where he perfected the morphing scene in *Terminator 2: Judgement Day*. He, in turn, recruited a number of Canadians who were both familiar with Canadian software and received training from schools such as Sheridan College in Oakville, Ontario. A pipeline was constructed. Because the Canadian talent deployed in large production houses explored the outer limits of the packages, they remained in constant touch with the software programmers back home. With such a strong feedback loop, the dominance of the Canadian technology was ensured.

One Alias demo artist, Chris Landreth, actually made a test film that was strong enough to receive a nomination for an Oscar. While guiding the evolution of Alias's new package “Maya,” Landreth animated *the end*, a six-minute short nominated for an Academy award in 1996. The film was used to test new features added to Alias's package including motion capture, facial animation and hair. Scripted and animated by Landreth, *the end* became more than an exercise in computer pyrotechnics. Landreth's witty scenario has it both ways, effectively satirizing pretentious art films starring God-like directors, while simultaneously being an example of exactly that type of film.

Alias, Softimage and Side Effects—today's big three high-end computer animation packages—built their temples on the foundations laid by the National Film Board, and on the ruins of Omnibus Computer Graphics, a high-tech development company that collapsed in 1986. Founded in 1982 by John Pennie, Omnibus was one of the first companies in the world to grab digital technology by the horns and wrestle with it. Pennie, a Toronto native, was originally a partner in Image West, a California-based company that used analog computers to distort video images. It was an early form of computer animation that relied on matte techniques, and was successfully used to create a “force field” in the feature film *Logan's Run*.

In 1976, Image West held 25 per cent of the computer animation market, which at the time was worth \$10-million worldwide. Encouraged, Pennie felt that “digital animation would be the wave of the future.” So, in 1980 he and Image West partner Cliff Brown split, and Pennie formed Omnibus Computer Graphics with \$2-million and an agreement with the New York Institute of Technology Computer Graphics Laboratory to become the first licensee of its software. With assistance from Cal Tech and Canada's University of Waterloo, Omnibus employee Greg Hermanovic developed proprietary source code. “They brought [computer animation] out of the academic world and into the commercial production world,” says Dan Philips, former creative director of Omnibus.

Omnibus's big break came when Alvin Toffler gave it the contract to do the special effects for the television series based on his book *The Third Wave*. For several exciting years in the mid-1980s, Toronto's Omnibus was the hottest computer animation development firm in North America. Its R and D was created on the fly, driven by clients who needed specific algorithms to create certain special effects. Its bread and butter came from commercials for Kodak, and logos for CBC-TV, CTV, Global and *Hockey Night in Canada*. The company did the reflecting spacecraft sequences for the feature *Flight of the Navigator* and licensed its technology to the Japanese co-producer of the *Shogun* mini-series. In-house, the company made Marilyn Monrobot, an articulated human figure in chrome-like materials. It was a very early precursor to *Terminator 2*.

In 1986, Omnibus gobbled up its U.S. rivals. First to go was Digital Domain (*The Last Starfighter* and *2010*), the only production company with a Cray X-MP supercomputer. Then it was Robert Abel and Associates, considered one of the most creative commercial houses in the world. The company brought director Norman Jewison on to its board of directors. For a fleeting moment, Pennie was poised to compete with Lucasfilm's ILM. But months after its fateful purchase of Robert Abel and Associates, Omnibus itself came tumbling down—a house of cards that collapsed under a mountain of debt.

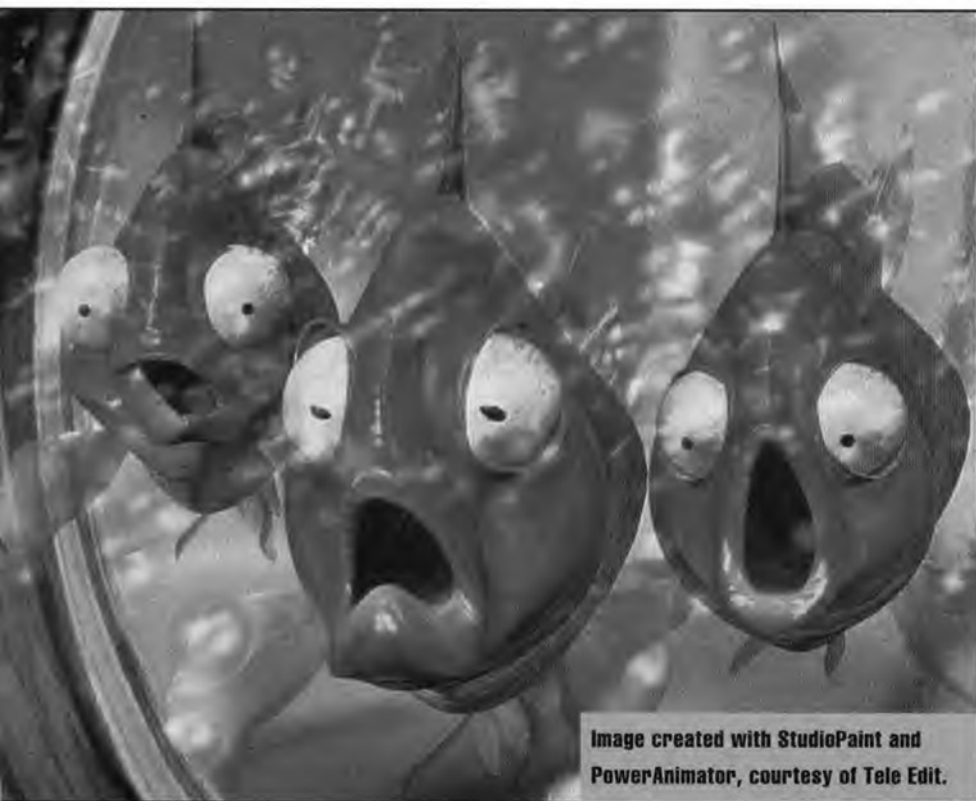
The result was both the death of a giant and the birth of a phoenix. The company's former software and creative people spun out into new ventures, taking with them a wealth of experience. Dan Philips eventually went to Disney as a special-effects consultant, and was instrumental in building the 3-D ballroom sequence in *Beauty and the Beast*. He is now a consultant for DreamWorks' special-effects unit. Animators

Doug MacMillan and Linda Bel are senior animators at ILM. And Omnibus head programmers Greg Hermanovic and Kim Davidson bought some of Omnibus's original source code which they developed, and within a year of Omnibus's demise set up their own development shop, Side Effects software.

Two other firms, Alias and Softimage, accompanied Side Effects into the burgeoning software animation field. Nigel McGrath, who had hired Hermanovic and Davidson to do commercials for him until they capitalized their own company, fronted

An unexpected turn led them to the industrial design world. Bingham and McGrath, a car enthusiast, paid a visit to Ron Hill, director of General Motors' aerodynamics design team in Detroit. Hill and his team at GM were so excited by Alias's fluid, realistic graphics, they pressed their noses to the computer screens. So convinced were they by Alias's approach they produced their own video to sell their board of directors on three prototype units. "All we had to do was to tag along and Ron Hill sold the system internally," says McGrath. The General Motors' deal was a twofold blessing. Blue-chip clients such as

National Film Board's French animation unit in 1979. René Jodoïn and later Robert Forget, executive producers of French animation, had already poured a lot of energy and money into early computer animation. Peter Foldès conducted a number of animation experiments and directed *Hunger* (1975) at the NFB using an early analog system to draw line characters. With that technology there could be no rendering or texture, but the film was noteworthy for its smooth transitions and form. An award-winner at Cannes, *Hunger* is a critical look at greed in today's consumer world. It was nominated for an Oscar as much for its content as for its revolutionary form.



At the time, the NFB had a 2-D computer system running on DEC PDP-11/33. Langlois's early assignment was to extend the system's 3-D capability and apply it to the first stereographic 3-D Imax computer-animated film, *Transitions*, shown at Expo 86. While working at the NFB, Langlois was hired to design and co-direct a film initiated by Pierre Lachapelle, Philippe Bergeron and Pierre Robidoux of Université de Montréal. Built using Tiaarna software developed by Lachapelle, *Tony de Peltrie* made waves at industry events because, for the first time an animated character was able to convey the subtle emotions of someone recognizably human; an aging crooner complete with flickering eyelids and wistful sighs. But Tony fell far short of an organic man. Looking like a strange hybrid of singer Tony Bennett and Brian Mulroney, the character retained the hard metallic look of computer graphics. Still, the character of Tony de Peltrie required more from the programmers than just plugging in numbers. For the first time, real acting was required of an computer-based animated figure. Despite international accolades, the software for *Tony de Peltrie* was still cumbersome. It took four programmers more than three years to produce six-and-a-half minutes of film.

Stephen Bingham and Susan McKenna, the cofounders of Alias. McKenna and Bingham had originally approached McGrath in 1984 because they wanted to do a computer-animated TV show, and couldn't afford Omnibus's price tag. With McGrath's commercial production house fronting the experiment, they hired computer whiz-kid David Springer and started developing a cheaper 3-D program. "He [Springer] was the classic early hacker, and I think it was some of his energy that led us down interesting paths," recalls McGrath.

Honda, Motorola, Goodyear, Kraft, NASA, and Mitsubishi came aboard, giving Alias the clout to make a public offering on Nasdaq in July 1990. The demand of these early clients forced Alias programmers to work out the modelling bugs and design good interfaces. It is a legacy that remains to this day. Alias is still considered the number 1 modeller on the market.

Across the linguistic divide, Daniel Langlois began developing a top-notch computer program after joining the

Convinced he could develop software that was artist-friendly, Langlois helmed his own company, Softimage, in November 1986. In 1988, with \$350,000 from a group of Toronto investors, Langlois launched his software package, Creative Environment. It became an instant hit with high-end users because it was easier to use and

better suited to moving models around than anything else on the market at that time. The "inverse kinematics" feature added to its 1991 package, Actor, put Softimage farther ahead of its competitors. Actor is a package with built-in knowledge of how a body should move in response to any particular movement. If an animator commands his character's arm to raise, the shoulder and hand will move naturally, and in tandem with the arm. Soon high-end companies not only worked with Actor, but set up modules running Softimage packages. Softimage gave fluidity to the dinosaurs of *Jurassic Park* and enabled Meryl Streep's head to turn 180 degrees in *Death Becomes Her*.

Today, Canada's top two companies in the 3-D software market are American owned. In February 1994, Microsoft Corp. bought out Softimage stock for \$176-million. Microsoft wanted to ensure that software for the low-end market would be compatible on PC platforms. Not to be outdone, Silicon Graphics bought out Alias and Wavefront Technology (a competing American software company) to ensure its place in the high-end world in February, 1995 in a deal worth about \$440-million.

Side Effects, the upstart company formed by Hermanovic and Davidson is going strong, and has no intention of selling out to a southern giant. Meanwhile, its software, Prisms—and its latest entry, Houdini—is noted for its flexibility and easy plug-ins that provide a high degree of control. Prisms' tools were difficult for artists to learn, but Houdini's new interface has been described by a reviewer in *Computer Graphics World* as "more like a fine champagne in a beer-and-soda world."

While software is the jewel in the Canadian crown, the 3-D production house, Vancouver-based Mainframe, is the only company in the world successfully producing long-form 3-D animated shows for television. *ReBoot* was a concept that floated around in London, England for years until Canadian producer Chris Brough decided to take advantage of Canadian software, talent, and tax credits by bringing the project to Canada as a co-production. When the U.K. partner went bankrupt, Alliance Communications, Canada's largest film-and-television production house, came to the rescue to the tune of \$4-million. It was a canny move on the part of Alliance. Almost immediately, *ReBoot* became a hit in the United States for ABC and Canada's YTV.

ReBoot is a successful marriage of concept and technology. By setting the series in a computerized environment, the inorganic characters that 3-D TV animation produces do not look out of place or unnatural in the show. *ReBoot* is essentially anthropomorphized computer innards with characters such as Megabyte and Hexadecimal living in the multilevel city of Mainframe. The city itself is populated by digital information bytes called binomes which look robotic, and humanoid characters called data sprites who often find themselves caught up in games initiated by the User, an unseen controller who can manipulate the electronic environment.



Image created with StudioPaint 3-D by Daniel Hornick, courtesy of Alias/Wavefront.

Three-D animation is still on the cutting edge of a new frontier. The cowboys riding the new technology have had to tame the beast, find its breaking point, and push past it. They are forced to mix and match software packages, and even write their own code. And just as they get one problem solved, another arises. On the technical front, Canadian Bill Reeves (who was jointly awarded an Oscar for *Tin Toy* with John Lasseter) developed Pixar's procedural modelling environment, MenV, with Eben Ostby. He is also the brains behind the development of RenderMan software and numerous other algorithms that made computer graphics practical for use in the film industry. Over the years, he has been joined by technicians Darwyn Peachey and Rex Grignon. Another group of transplanted Canucks played a big role in animating *Toy Story*.

Canadian Steve Williams was definitely one of the bronco busters at ILM. A former demo modeller at Alias and Side

Effects Productions, Williams joined ILM in 1988. At the time there were only six people on staff but changes were imminent. A string of megahits, including Williams's work on *Terminator 2*, had feature film producers upping the ante in the special effects arena. Suddenly every director who had shelved a film that had been labelled "technically impossible" was dusting it off. It wasn't long before Williams decided he no longer wanted to make the special-effects icing for films. He wanted to create the star.

Williams got his chance with *Jurassic Park*. When producers Kathleen Kennedy and Frank Marshall originally approached ILM, all they wanted was a shot of a stampeding herd. The rest of the dinosaurs were to be models shot using stop-motion or puppeteered by 16 or more animators. "I wanted the protagonist—the Tyrannosaurus Rex," says Williams. On his own time, Williams graphically constructed the leg bones of a T-Rex using Alias's modelling package. It was an unsanctioned move, but it paid off. The producers were so impressed that they advanced ILM money for Williams and fellow Canadian Eric Armstrong to construct the skin and generate a walk cycle using Softimage software. Spielberg pulled the plug on the stop-motion studio when he saw their results and threw his lot in with the computer team.

By 1995, staff animators numbered 450. Forced to recruit, Williams went north of the 49th parallel to look for new candidates. Sheridan College grads were his target. He wanted people who could animate first, and learn the software second. "When I was hired they were looking for people with traditional knowledge, who had gone

to animation schools, and had knowledge of Softimage," says Robert Coleman, who was one of a large number of Canadians hired after *Jurassic Park*. Coleman, an animator on *The Mask*, and supervising animator on *Dragonheart*, was one of those who met ILM's requirements. Good animators are in such demand now, ILM doesn't care whether or not recruits have knowledge on the computer. "Today, we will teach you Softimage, but you have to show us that you know the fundamentals of animation," says Coleman. "That's hard to teach people. You've either got it in your bones or you don't."

In the last four years, Williams's team of Canadians have tackled ghostly images in *Casper*, realistic tornadoes in *Twister*, animal hair in *Jumanji*, an enormous dragon in *Dragonheart*, and Martians in Tim Burton's *Mars Attacks*.

Williams himself may be the new crown prince of computer animation. In 1996, he quit ILM to operate under his own banner, Pull Your Pants Down Productions. Signed as a second-unit director and animation director on New Line Cinema's feature *Spawn*, Williams has rocketed into the Hollywood stratosphere. He predicts that



Soul Blade computer game created with Softimage software. Copyright Namco Ltd.

the effects industry will eventually collapse under its own weight. "I went to the premiere of *Twister*," says Williams "and when the screenwriting credit came up, people booed. There is going to be a revolt. The box office says the [audience] numbers aren't coming down, but I think people will get sick of effects films." As a director, Williams hopes to have an impact in the industry by taking full advantage of the new technology. If he does, then computer animation will have truly broken out of its creative cell. ■



The 1996 mega-hit *Twister*, with special effects created with the use of Softimage software. Canadians have played a major role in the evolution of digital imaging.