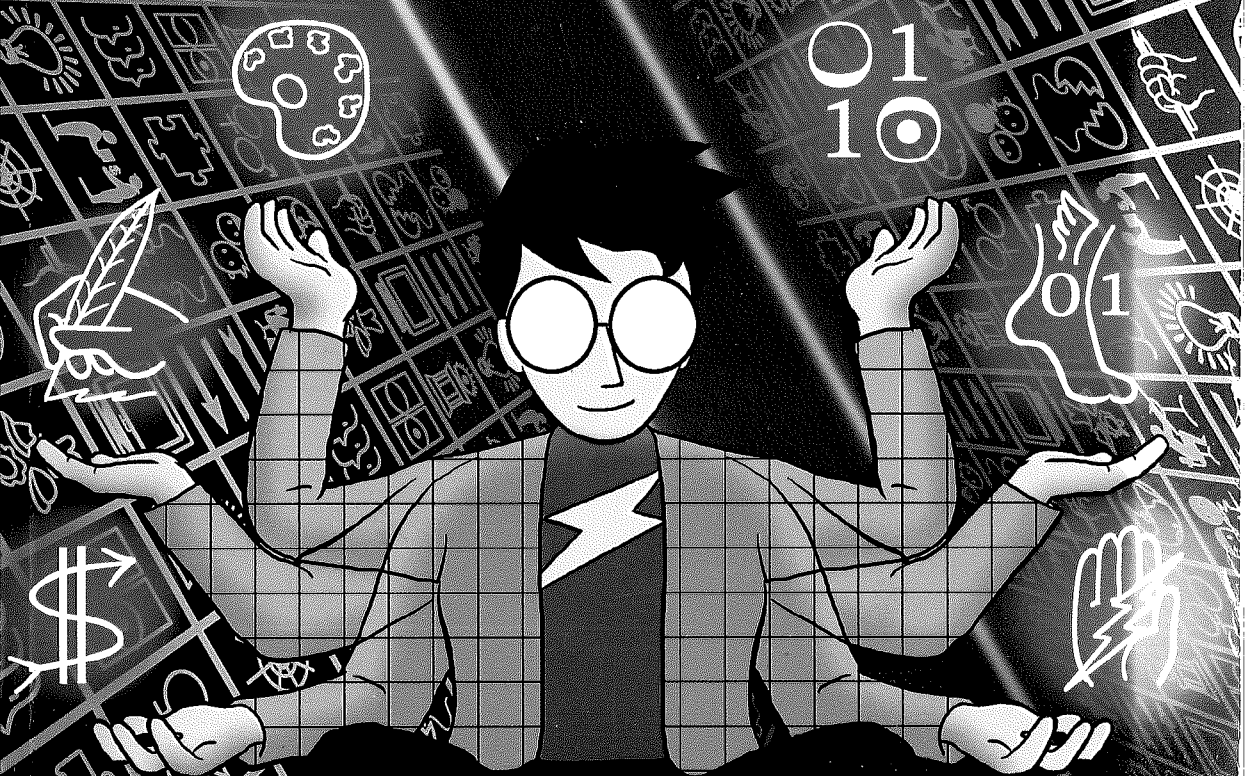


REINVENTING **COMICS**

**How Imagination and Technology
Are Revolutionizing an Art Form**



SCOTT McCLOUD

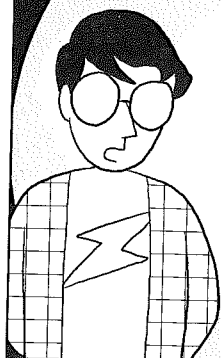
AUTHOR OF UNDERSTANDING COMICS

THROUGH THE DOOR

Digital Production



Using computers to make art is an idea nearly as old as computers themselves.

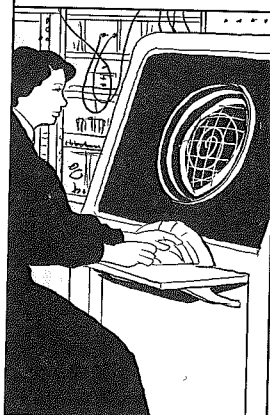


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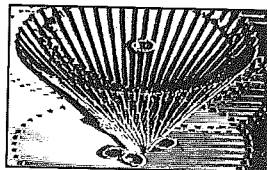
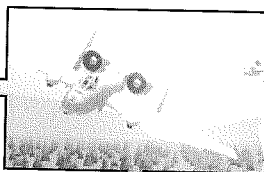
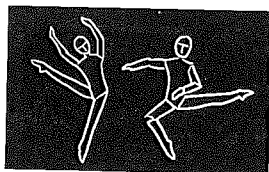
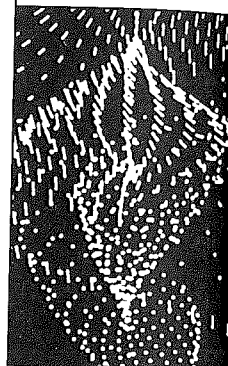


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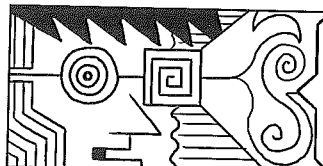
Even the old vacuum tube giants like Whirlwind dabbled occasionally.



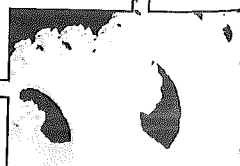
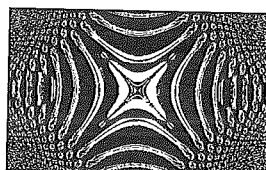
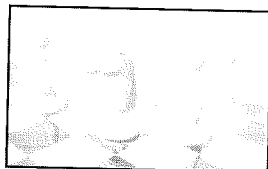
But it wasn't until the 1970s that computers were generating unique new images on a regular basis.



Some early computer artists used the new tools to imitate, refer to and process the appearance of the physical world.



Others revealed in the kinds of images that only computers could produce.



See end of book for full art credits.

Proponents of *both* approaches saw computers as a boon to artists in *all* fields, but few *individual artists* had much incentive to *switch tools* during computing's *early years*.

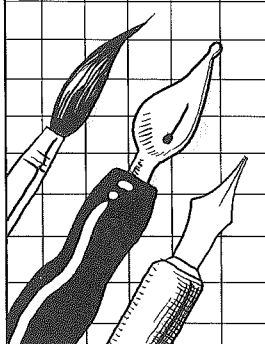
Throw away that old drawing desk, Leo! This baby can draw a perfect circle in just five minutes and it's only \$900,000.00!

click
SURRENDER,
PUNY HUMAN.

And, though far *cheaper*, the *personal computers* of the 70s and *early 80s* were still primarily *number-crunchers*, not easels.



The *technology* of making pictures was already a *subtle* and *sophisticated* one, long *before computers*.



Most artists showed *little interest* in making art by *entering commands* into a *machine* when they could stay rooted in a far more *intuitive* world where "*what you see is what you get*."



THE FACE OF COMPUTING IN THOSE DAYS -- THE "INTERFACE" BETWEEN MACHINE AND USER -- WAS A STARK ARRAY OF WRITTEN COMMANDS, OFTEN IN AN ARCAIC LANGUAGE REQUIRING SPECIALIZED KNOWLEDGE TO ACCOMPLISH EVEN THE SIMPLEST OF TASKS --

> WARNING: ERROR LINE 47.

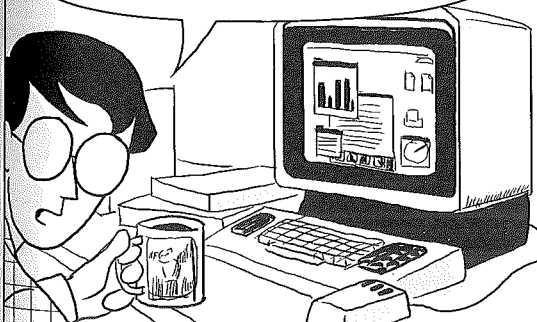
-- LIMITED KNOWLEDGE TO ACCOMPLISH EVEN THE SIMPLEST OF TASKS --

> ILLEGAL COMMAND: 132452 SYS/D4038
> SYS STAT/MEM CONF837-97 A:&)%

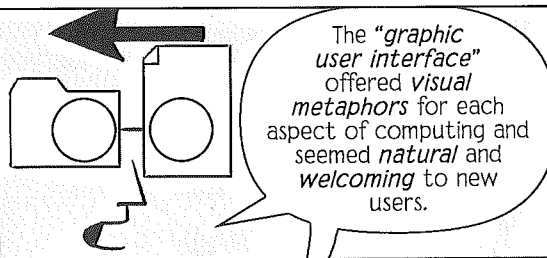
-- K.S. (OH, NEVER MIND...)

> ABORT? ■

But as early as 1973, engineers at Xerox's *Palo Alto Research Center** had been investigating a way to *represent* the landscape of computing *graphically* in hopes of dramatically increasing *usability*.



Xerox's "Star" computer, complete with an early mouse.



Xerox was unable to successfully *market* their innovation, but *others soon did*** with some *spectacular results*.



The Apple Macintosh, 1984

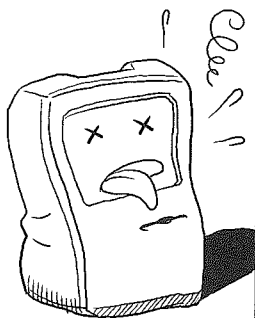
Microsoft Windows, 1985



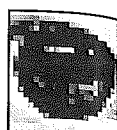
*Known as "Xerox PARC"

**Apple execs (including Steve Jobs) visited Xerox PARC shortly before creating the style of interface now found in Macs. Microsoft soon followed suit with Windows.

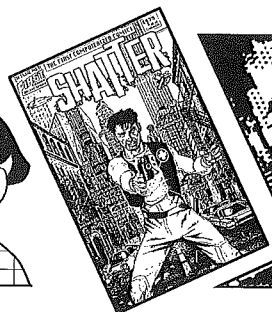
Unfortunately, in the 80s, the G.U.I.'s impressive toolbox was hampered by a lack of *speed* and *power*.



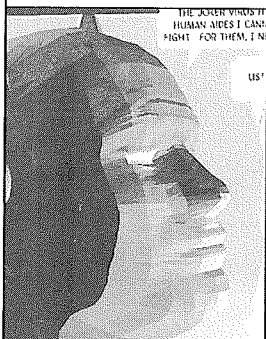
The adage that "*a picture is worth a thousand words*" proved an *understatement* when a single *print-quality image* could be composed of up to *100,000,000 pixels*.*



Thus, the first *digitally-produced* comics** in the mid-80's were necessarily *raw* and required *enormous* investments of *time* and *expense*.



Later, more *elaborate* digital comics art often allied itself with *safe*, *familiar genres*.



Art from *Batman: Digital Justice* by Pepe Moreno

As the technology has *matured*, a few have used computers in the service of a distinctly *natural media* sensibility.



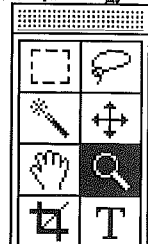
Art from *Mr. Punch* by Neil Gaiman and Dave McKean.

And a few, *very* few, have put the most *exotic* aspects of computer generated imagery *front* and *center* in hopes of presenting something unmistakably *new*.

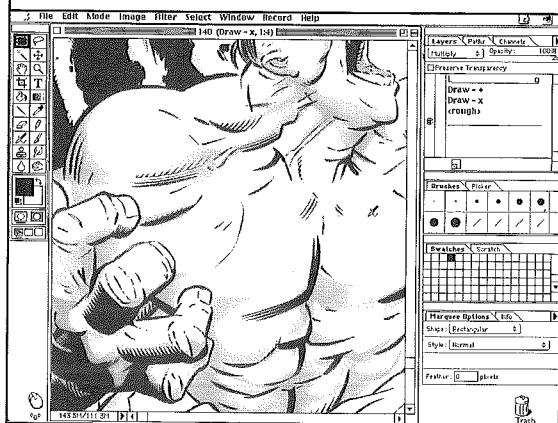


Art from *Blue Loco* by Mark Landman

Meanwhile, *behind the scenes*, computers are becoming ubiquitous in the *finishing* of comic book art for publication.



As of this writing, the *lettering* and *coloring* of pen-and-ink *mainstream titles* is rapidly being commandeered by *digital* systems, with surprisingly *understated* results in many cases.



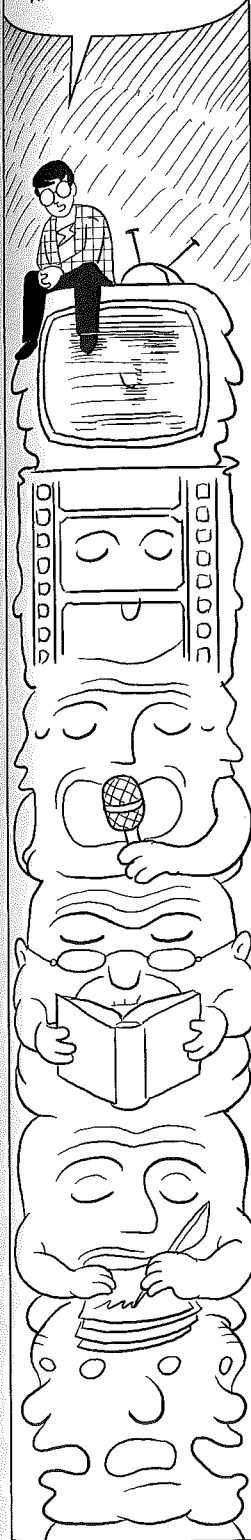
Many in the profession use the computer as merely a *tool* to accomplish more *efficiently* tasks that were already being done in the years when *color separation* was up to a team of *old ladies* in *Bridgeport* with *Exacto Knives*.



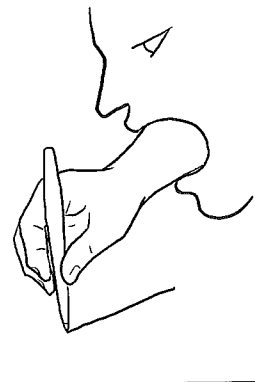
*Pixels: Short for picture elements, the tiny dots that computers process to create the illusion of continuous tones.

**Pictured: *Shatter* by Peter Gillis and M. Saenz, produced on a Mac in 1985 where they were just those tiny little things!.

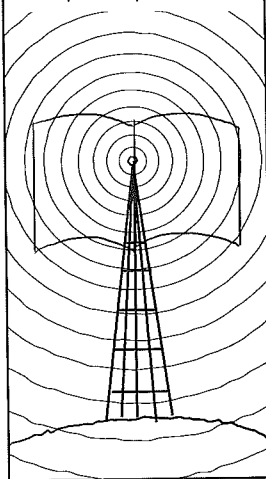
Such *conservatism* is a small example of the *broad tendency* we all have to interpret *new media* through the *filter* of the *old*.*



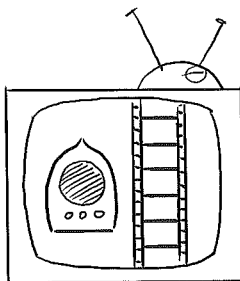
Early *written language* was filled with artifacts of the *oral tradition* --



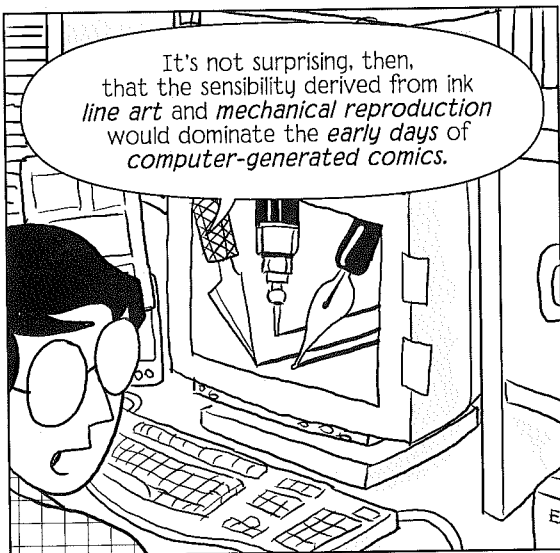
-- early *radio* was steeped in *print* --



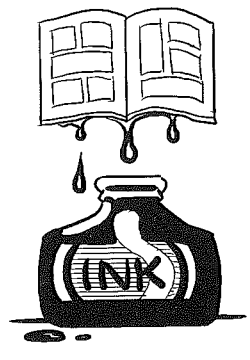
-- early *television* was bred of radio and the movies.



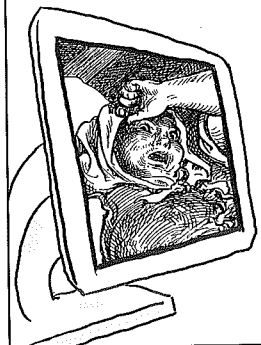
It's not surprising, then, that the sensibility derived from *ink line art* and *mechanical reproduction* would dominate the *early days* of *computer-generated comics*.



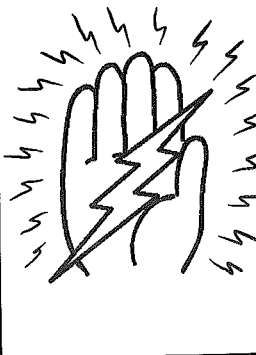
Naturally, a sensibility of *ink drawing* will always be relevant to works *reproduced* in *ink* --



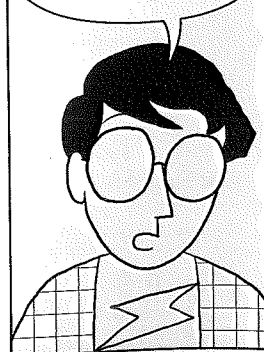
-- and even art destined for the *screen* can benefit from the study of *old masters* --



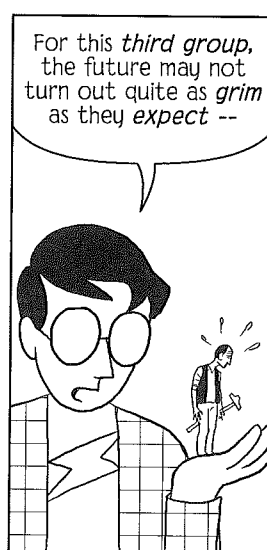
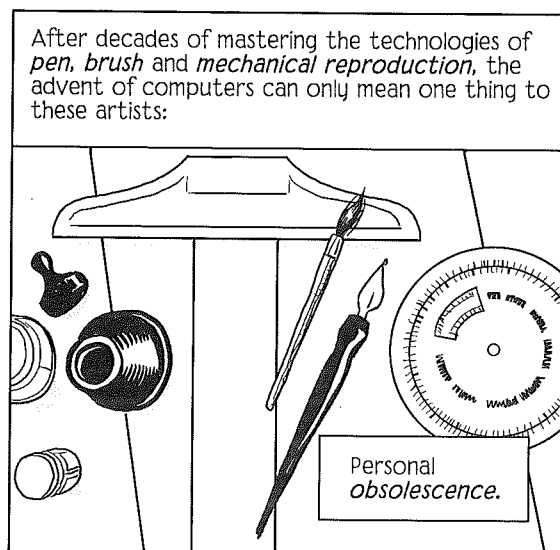
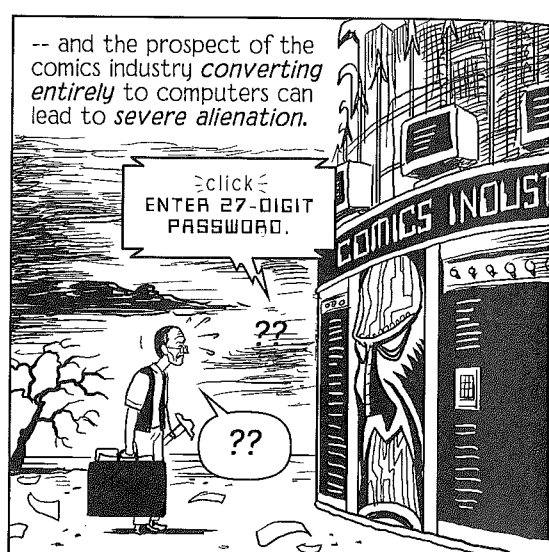
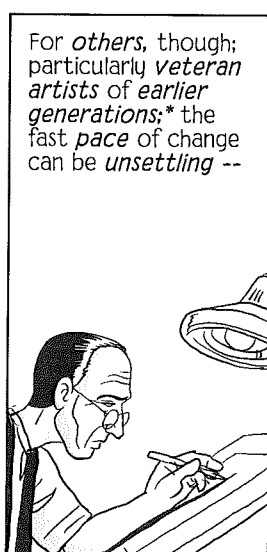
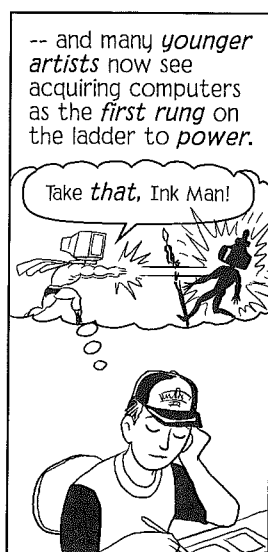
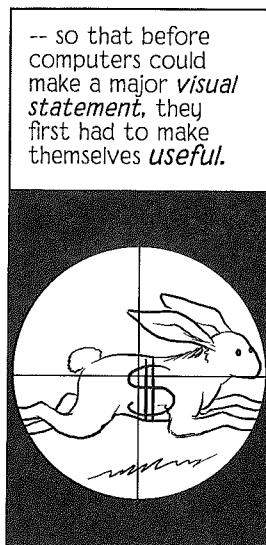
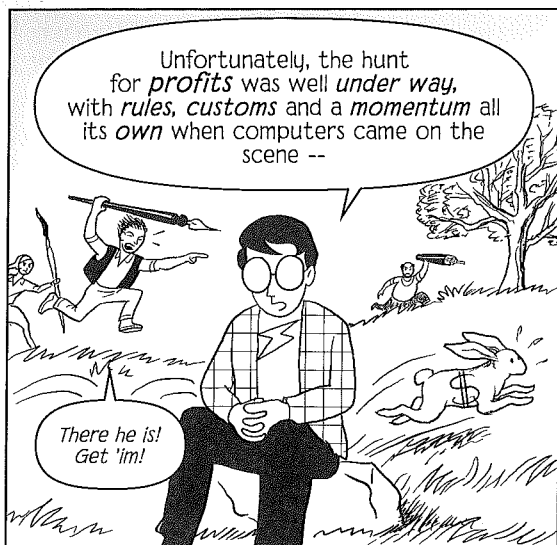
-- but to choose computers as one's *primary* art-making tool is to choose an almost *superhuman* palette of *options* --



-- and to devote it to merely *imitating* their predecessors is a bit like hunting *rabbits* with a *battleship*.

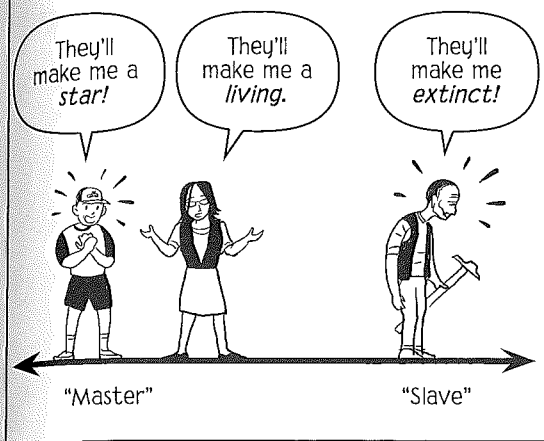


*Marshall McLuhan was a frequent proponent of this idea.



*Though every generation has its share of artists who avoid computers like the plague.

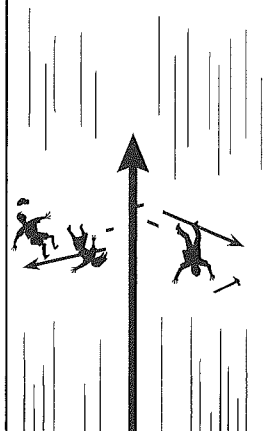
Groups one and two see themselves as *masters* (or *potential* masters) of the new tools, those in group three feel like *slaves* -- or *worse*.



Despite their differences, though, *all three* views cast computers as either helping or hindering the *goals* of the artists without significantly changing the *nature* of those goals --



-- and *all three* will feel the ground *shift* beneath their *feet* --



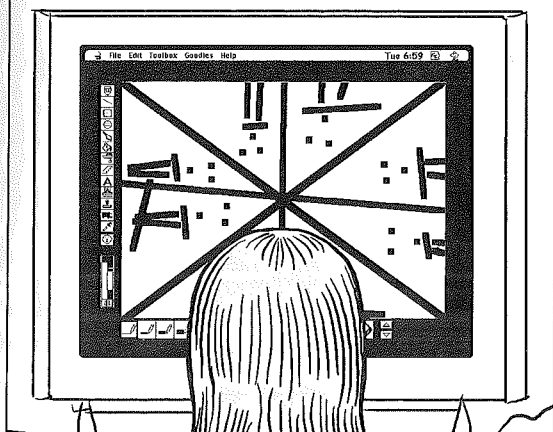
-- when the *next* generation gets in the game.



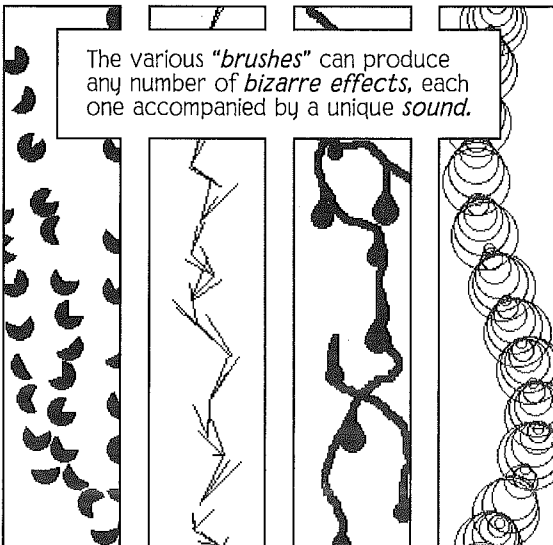
It's my guess that those who will do the most to *reinvent* the *look* of comics, *whatever* their *age*, will do so with an *attitude* much like my 4- and 6-year-old *daughters*.



One of my kids' favorite art programs is *Kid Pix*,* a versatile application featuring a wide *variety* of nifty *tools*.

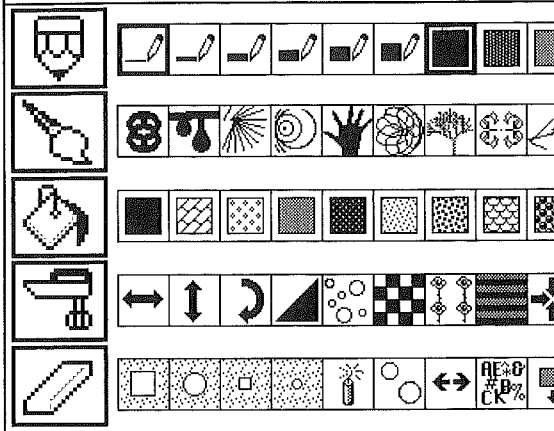


The various "*brushes*" can produce any number of *bizarre effects*, each one accompanied by a unique *sound*.

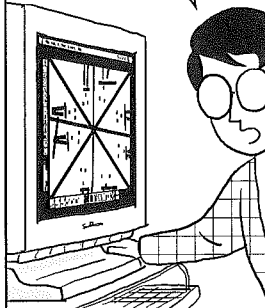


*Kid Pix has been around for years and is considered something of a classic. Even I like playing with it.

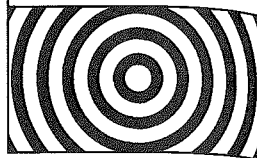
Each item on the *tools palette* has a vast *sub-palette* of *variations*, and even our *youngest* has *explored* them thoroughly.



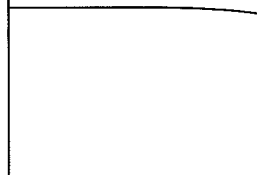
One of the "eraser" variations is a little stick of *dynamite*. If you select it and *click* on your picture --



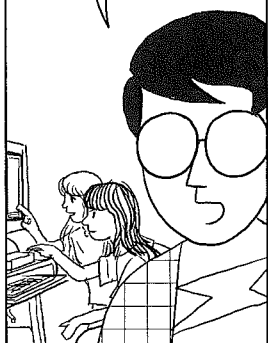
-- there'll be a *loud boom*, some spreading *concentric circles* --



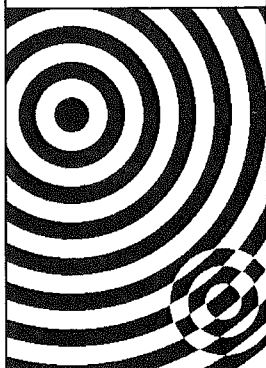
-- and the picture will *disappear*.



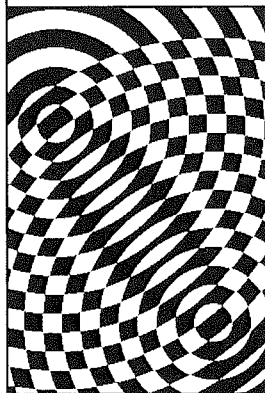
That's what it's *for*. But that's not all my kids *use* it for.



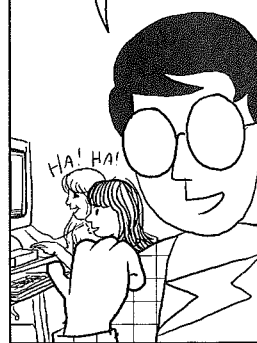
It seems if you click on the dynamite *again*, before the circles are *gone*, you'll find that they *stay in place* --



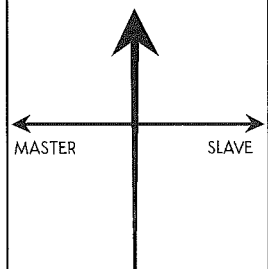
-- and can then be *combined* with *other* such patterns by repeating the process in a *different spot*.



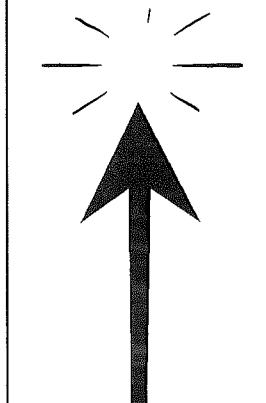
Now just try telling my kids that's *not* what an *eraser* is *supposed* to do!



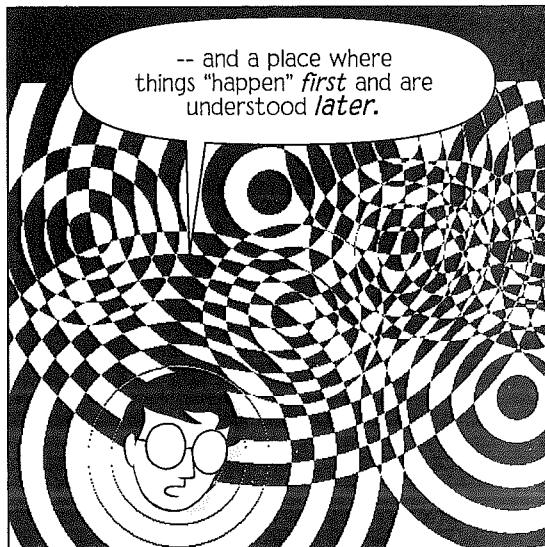
My kids don't see their *relationship* with the computer as either master *OR* slave.



To them, the computer is an *environment* to *explore*, an *extension* of their *whims* --

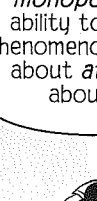


-- and a place where things "happen" *first* and are understood *later*.



This ability to *play* with the new tools, to learn them from the *inside*, is our best hope of *understanding* them.

Kids don't have a *monopoly* on the ability to play. This phenomenon is as much about *attitude* as about *age*.

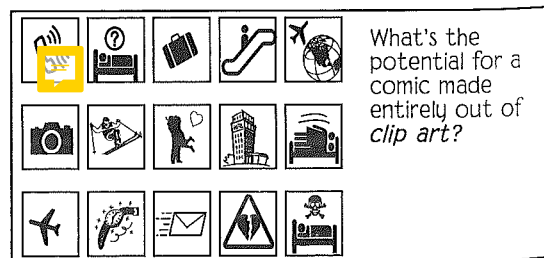
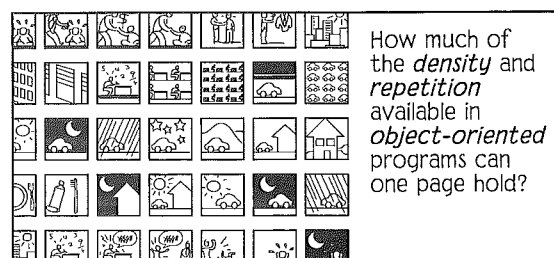
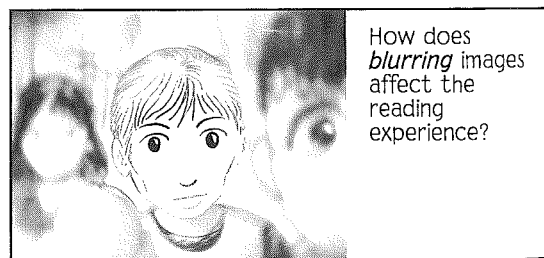
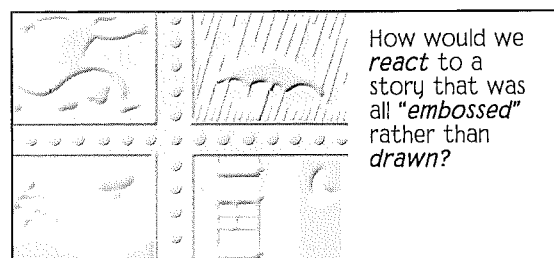
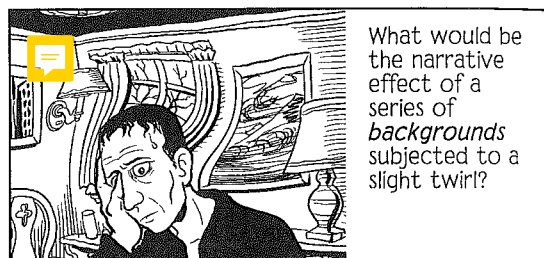
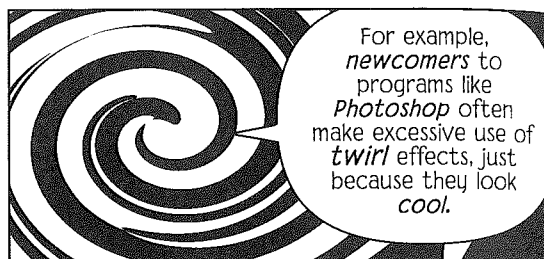
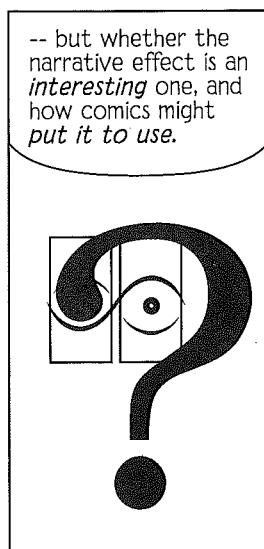
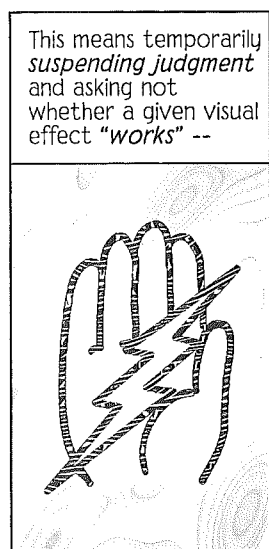
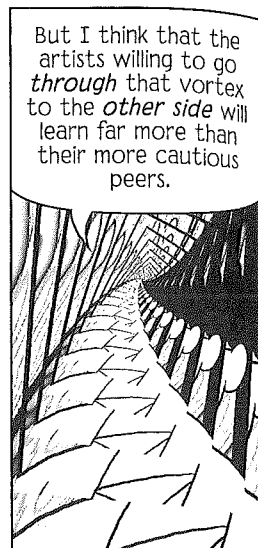
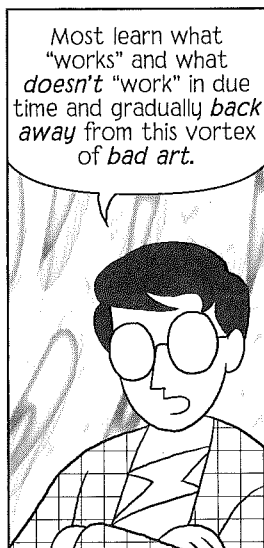
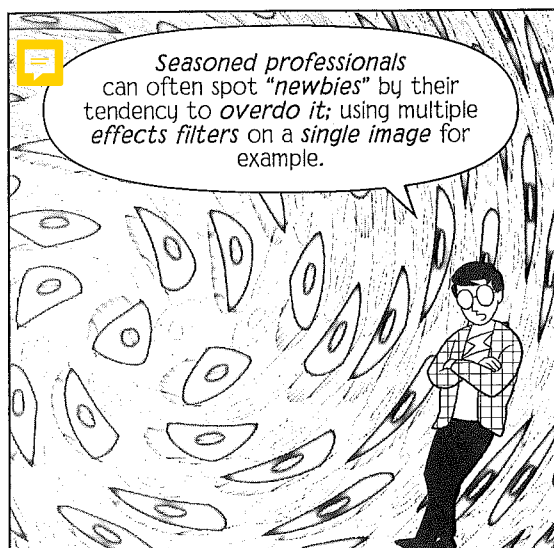


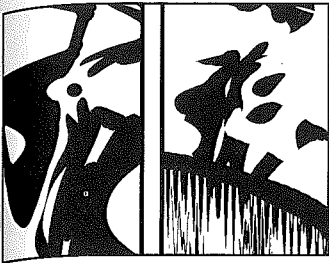
But for many artists *my age* and up, a certain amount of “*un-learning*” may be in order.

[illegible]

Needless to say, I *hadn't*; and I've since become aware of how *many* artists like me have failed to open *any number* of doors that could have led to *new possibilities*, simply because it wasn't their *job*.

It rarely *starts* that way. *Beginners* in digital media often *revel* in their *newfound* abilities, *flinging open door* after *door*.

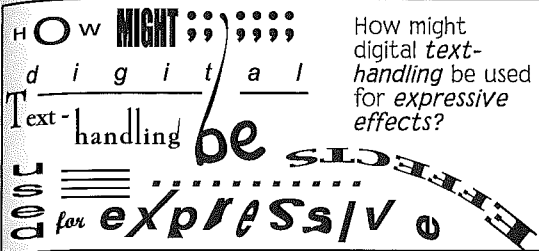




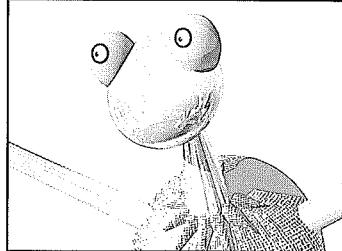
What are the *outer limits* of *sequential abstraction* and *readability*?



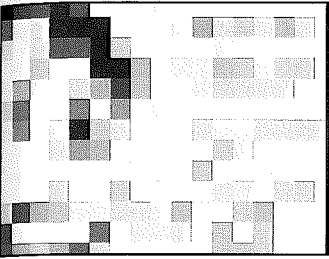
How could *motion* be represented through *streaks*, *noise* and *motion blurs*?



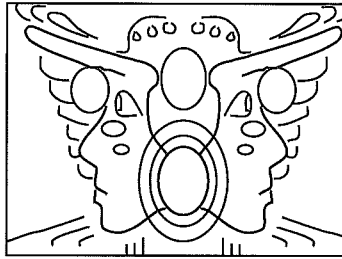
How might digital *text-handling* be used for *expressive* effects?



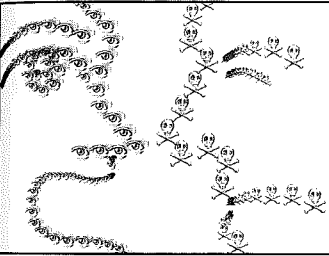
How does *cartoon stylization* operate in a 3-D environment?



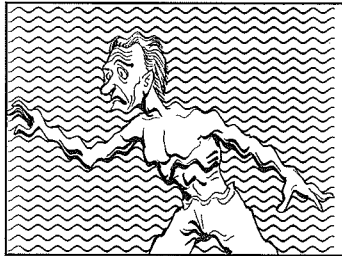
How would readers decode a mosaic of oversized "pixels"?



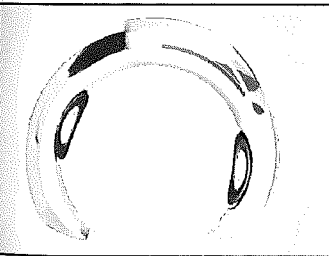
What are the narrative effects of the perfectly *symmetrical* images that computers can produce?



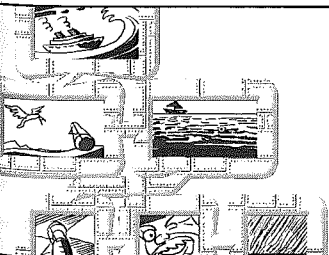
How might artists use the multilayered effects of "image hoses" and custom *brush* effects?



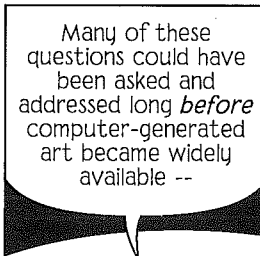
How can *ripple* and *wave* distortions raise *anxiety* levels in an image?



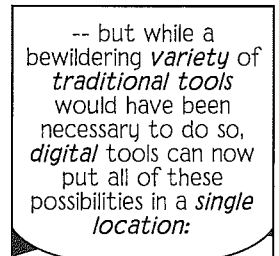
How can programs that render *realistic* imagery contribute to the *surrealistic*?



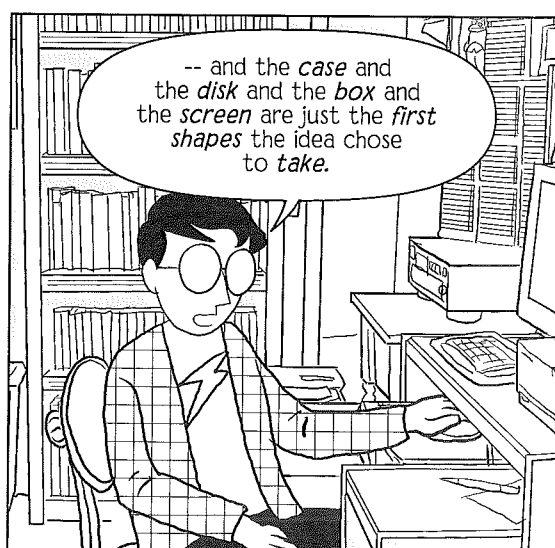
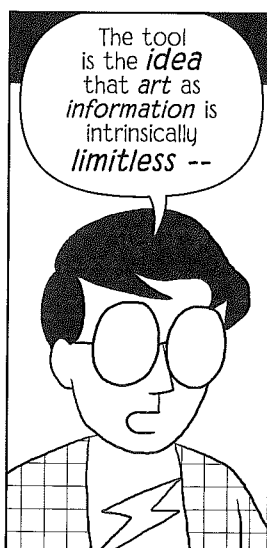
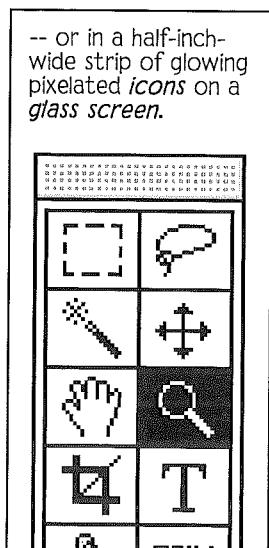
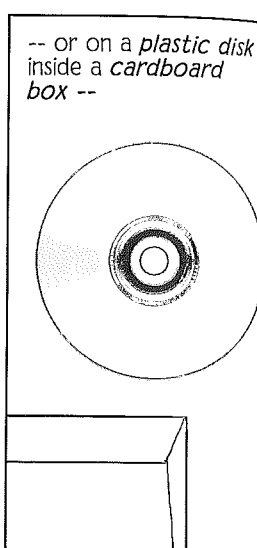
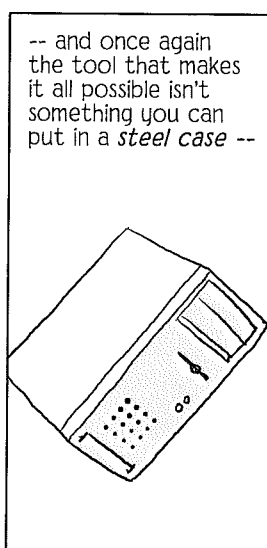
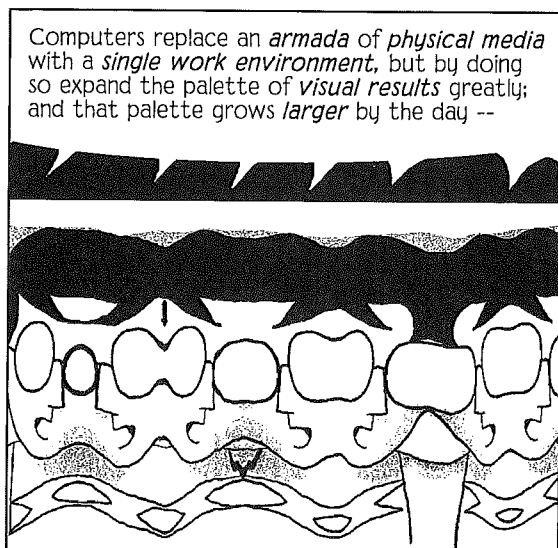
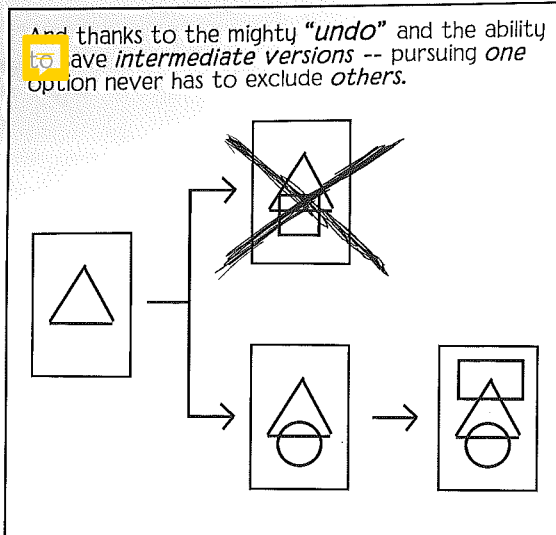
How would it affect our sense of time if the panels *themselves* took on a *physical presence*?

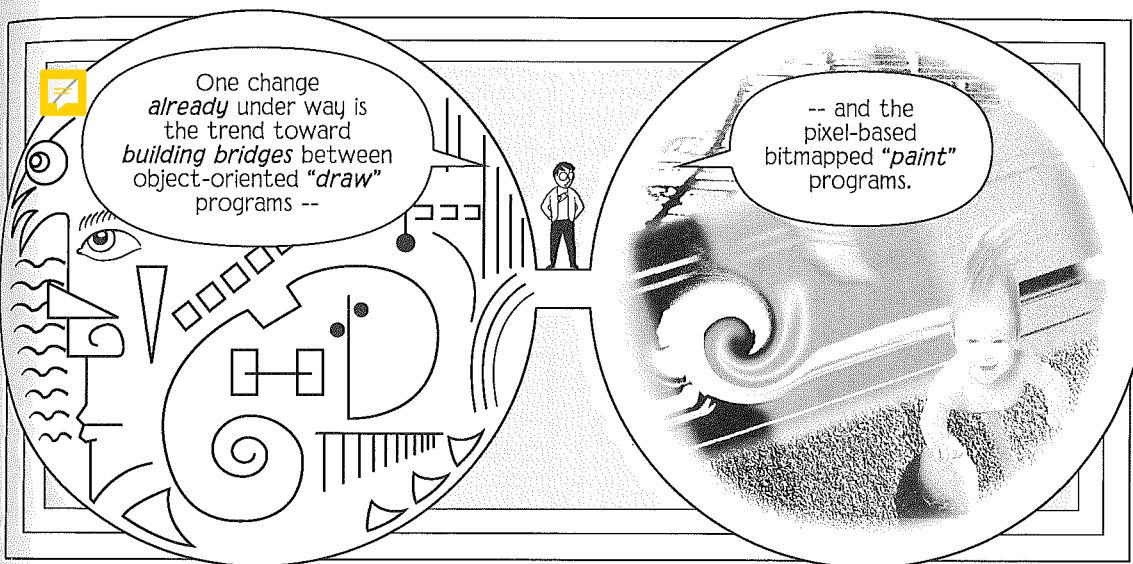
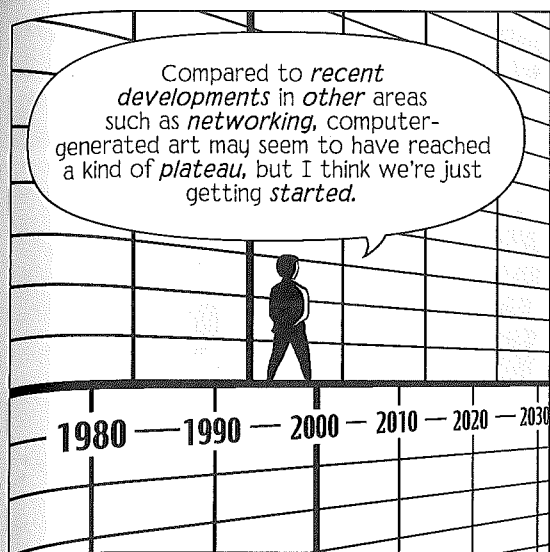


Many of these questions could have been asked and addressed long *before* computer-generated art became widely available --



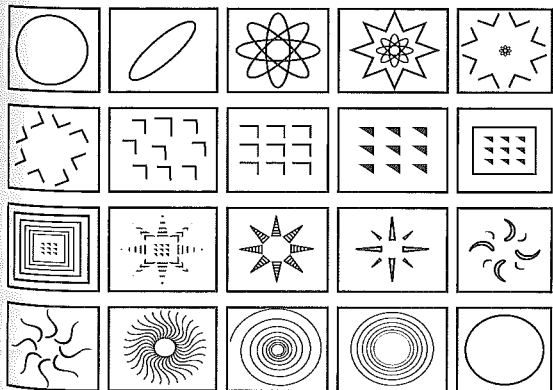
-- but while a bewildering *variety* of *traditional tools* would have been necessary to do so, *digital* tools can now put all of these possibilities in a *single location*:

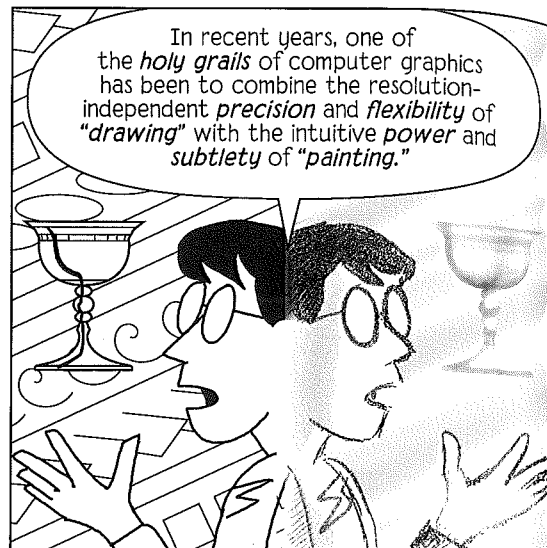
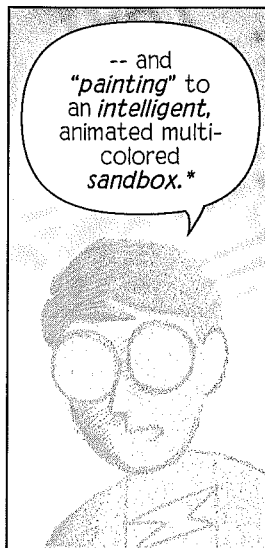




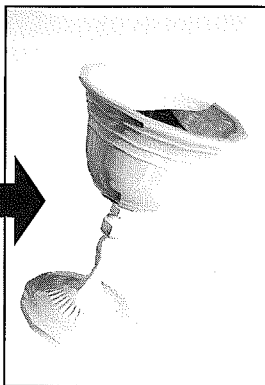
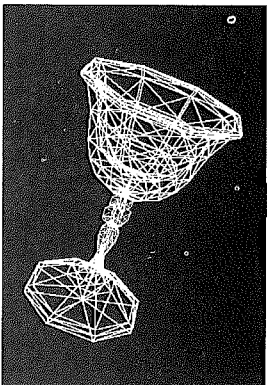
Since every piece of a "draw" program's output is a *mathematically defined object*, it can be *moved*, *duplicated* and *transformed* again and again while always staying *sharp* and *precise*.

In contrast, "paint" programs store and process images as vast mosaics of tiny *pixels* which *shift colors* imperceptibly with each *change* made to the *whole picture*.



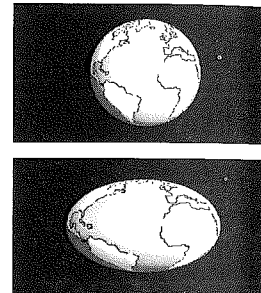
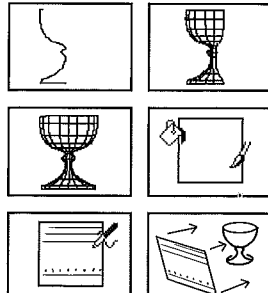


This *convergence of application strategies* may have its greatest impact on *3-D modelers*, most of which generate "drawn" wireframe *skeletons* wrapped in "painted" *skins* of light and texture.

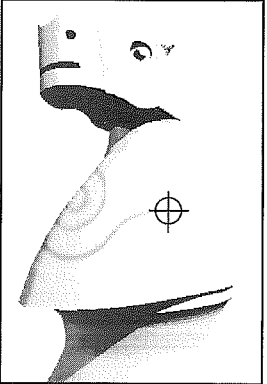


The *preparation* of such models has traditionally been a tedious *step-by-step* procedure that reflects the *rift* between the two types of programs --

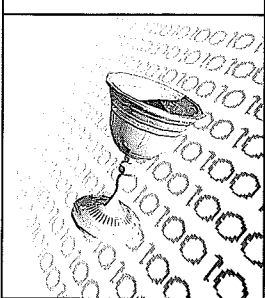
-- but as processor power continues to *grow*, artists are gaining the ability to render images *on the fly*, even in the early modeling phase --



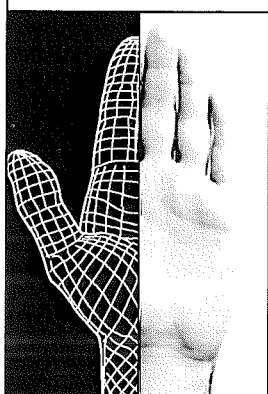
-- as well as "*painting*" *directly* on *finished models* rather than just their *flattened prefabricated skins*.



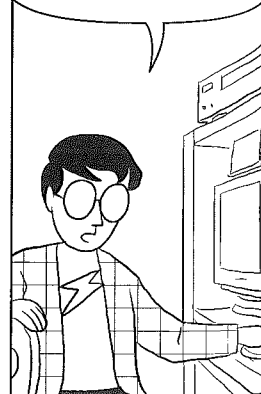
In other words, by *breaking down* the construction of a particular *type* of imagery into its constituent *parts*, computers gained power to *generate* such images --



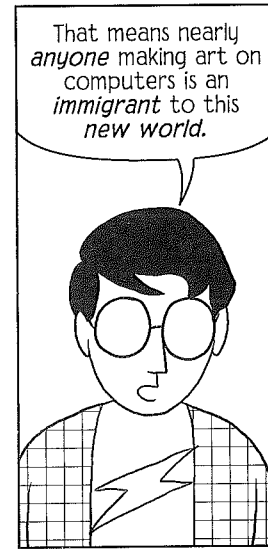
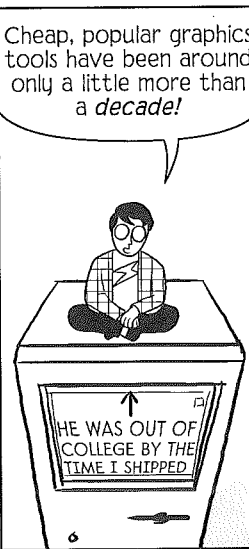
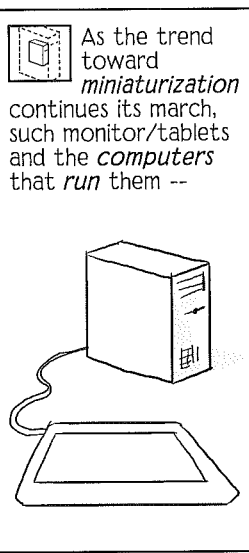
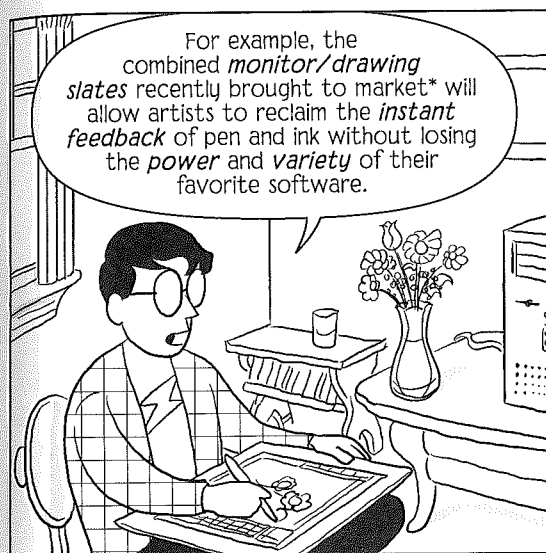
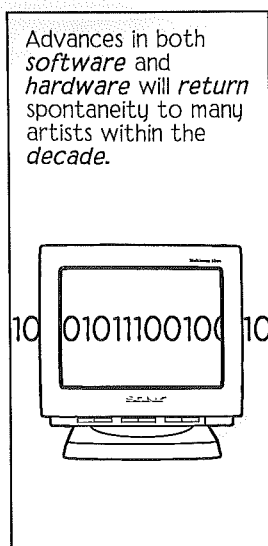
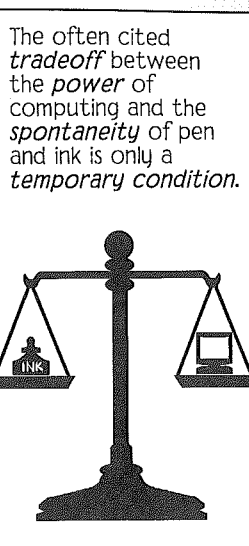
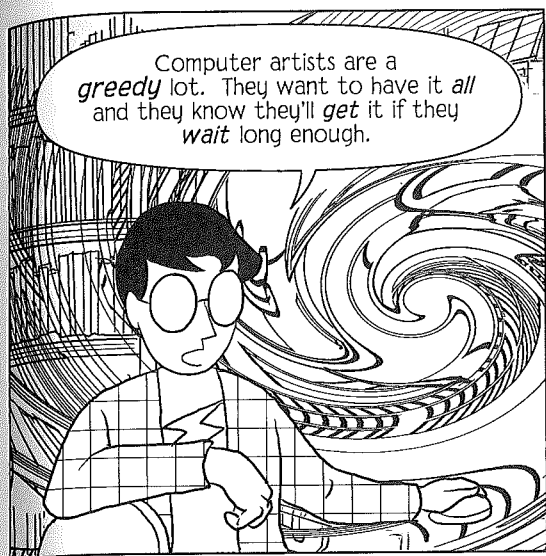
-- but by putting the parts *back together*, collapsing those steps into an *integrated intuitive process* --



-- developers are giving the artists who *use* these tools a much appreciated *shortcut* to *mastering* them.

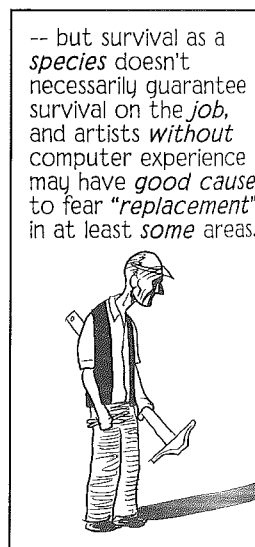
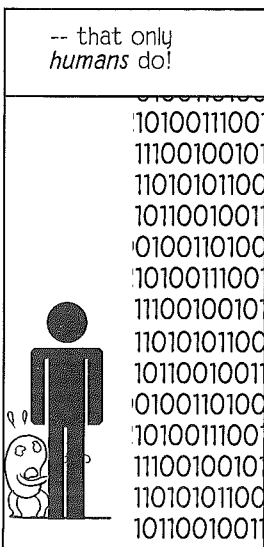
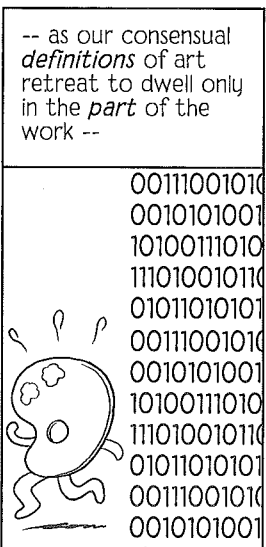
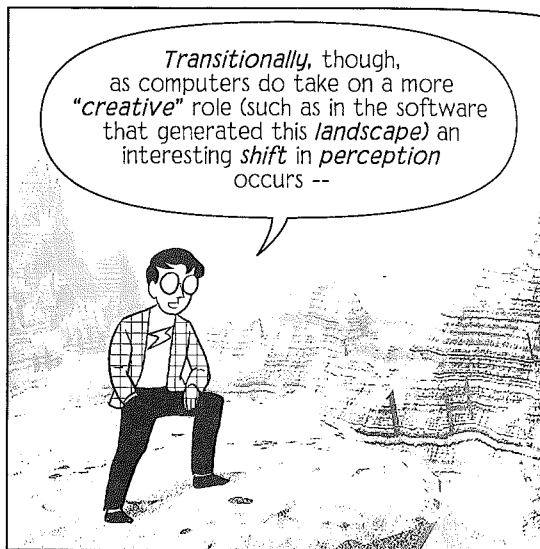
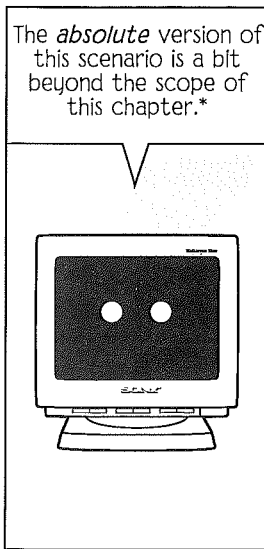
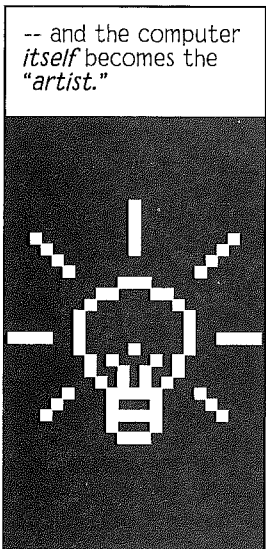
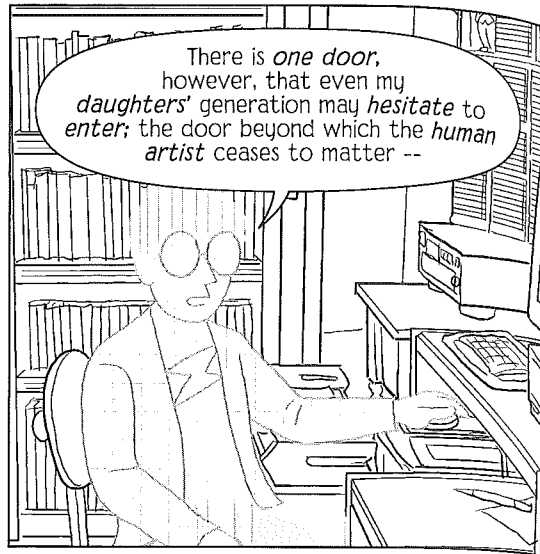
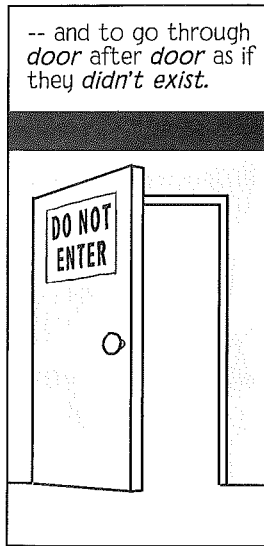
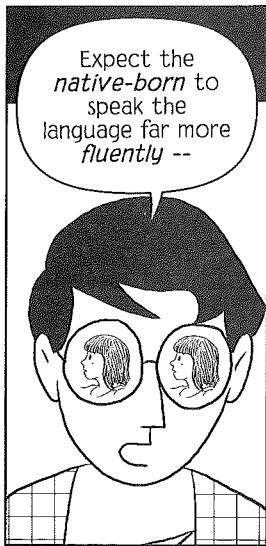


*Unfortunately, I can't remember who first made this comparison; anyone want to take credit? (I'll list you on scottmcccloud.com).



*Still expensive... for now.

**I've had the pleasure of using prototypes of the kind of force-feedback devices necessary to accomplish this. They're a long way from "point-and-click!"



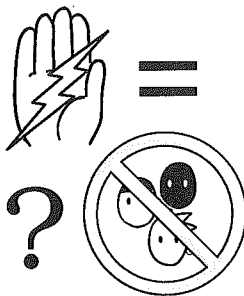
*Leading as it does directly into some of the broader topics associated with artificial intelligence.

As I write this, despite *plummeting prices*, getting *started* in computer graphics is still far from *cheap** --

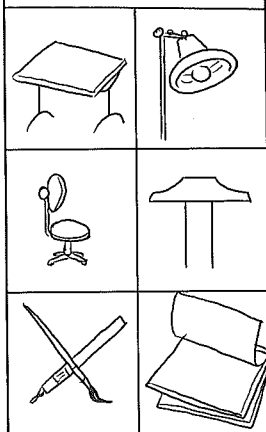
COMPUTER?



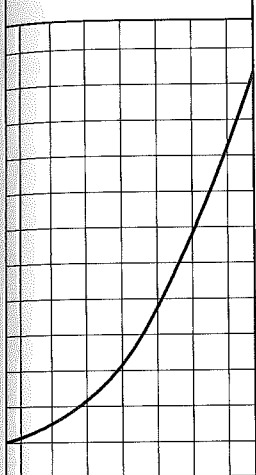
-- and may seem to contravene the spirit of at least one of our *earlier* revolutions which often revolves around *economically disadvantaged* artists.



Still, *traditional art* was never without its *expenses* --



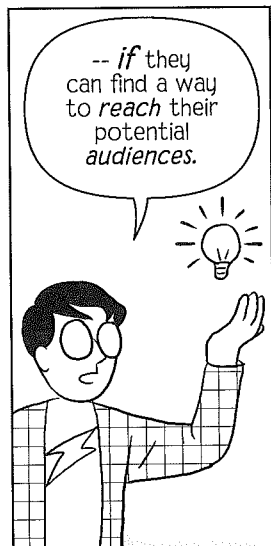
-- and *Moore's Law* isn't done with us yet!



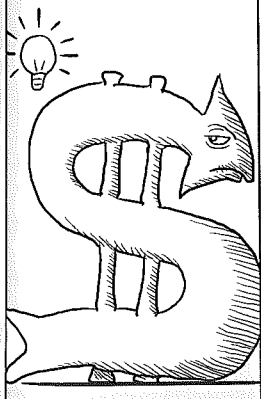
Within a *decade*, anyone with *modest means* and *sufficient desire* will be ready and able to *reinvent* the *look* of comics *forever* --



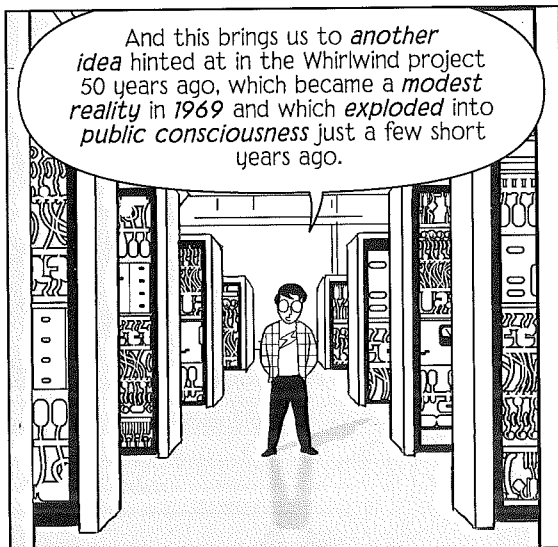
-- *if* they can find a way to *reach* their potential *audiences*.



Unfortunately, as we've seen, that kind of connection is hardly *guaranteed* in today's market.



And this brings us to *another idea* hinted at in the Whirlwind project 50 years ago, which became a *modest reality* in 1969 and which *exploded* into *public consciousness* just a few short years ago.



And it's an idea that *won't* be going away anytime *soon*.



*Entry-level computers have gone as low as \$400 at the beginning of Year 2000 but that's without a monitor, graphics software or graphics-related peripherals like scanners.