In the Kingdom of Mao Bell

A billion Chinese are using new technology to create the fastest growing economy on the planet. But while the information wants to be free, do they?

By Neal Stephenson (Published in Wired, February 1994)

In the inevitable rotating lounge atop the Shangri-La Hotel in the Shenzhen Special Economic Zone, a burly local businessman, wearing a synthetic polo shirt stretched so thin as to be semitransparent, takes in the view, some drinks, and selections from the dinner buffet.

He is accompanied by a lissome consort in a nice flowered print dress. Like any face-conscious Chinese businessman he carries a large boxy cellular phone. It's not that he can't afford a "prawn," as the newer flip phones are called. His model is prized because it stands up on a restaurant table, antenna in the fully erect position, flaunting the owner's connectivity - and in China, connections are everything.

The lounge spins disconcertingly fast - you have to recalibrate your inner ear when you enter, and I half expect to see the head of my Guinness listing. Furthermore, it is prone to a subtly disturbing oscillation known to audio engineers as wow. Outside the smoked windows, Typhoon Abe is gathering his forces. Shenzhen spins around me, wowing sporadically.

Thirty-one floors below is the Shen Zhen (Deep River) itself, which separates China-proper's Special Economic Zone from Hong Kong and eventually flows into the vast estuary of the Pearl River. The boundary serves the combined functions of the Iron Curtain and the Rio Grande, yet in cyberspace terms it has already ceased to exist:

The border is riddled with leased lines connecting clean, comfortable offices in Hong Kong with factories in Shenzhen,

staffed with nimble and submissive girls from rural China. Shenzhen's population is 60 percent female.

The value of many Hong Kong stocks is pegged to arcane details of PRC government policy, which are announced from time to time by ministries in Beijing. For a long time, the Hong Kong market has fluctuated in response to such announcements; more recently, the fluctuations have begun to happen hours or days before the policies are made public.

Hong Kong television is no longer targeted at a Hong Kong audience; it is now geared for the 20 million people in the Pearl Delta - the 80-mile-long region defined by Guangzhou (Canton) in the interior, Hong Kong and the Shenzhen SEZ on the eastern bank, and Macao and the Zhuhai SEZ on the western bank. Thickets of television antennas, aimed toward Hong Kong, fringe the roof of every Pearl Delta apartment block. Since TV Guide and its ilk are not available, Star TV regularly flashes up a telephone number bearing the Hong Kong prefix. Dial this number and they will fax you a program guide. This is easy for Shenzhen residents, because...
Every telephone in Shenzhen has international direct dial.

The first thing that happened during Jaruzelski's military coup in Poland was that the narcs invaded the telephone exchanges and severed the trunk lines with axes, ensuring that they would take months to repair. This and similar stories have gotten us into the habit of thinking that modern information technology is to totalitarianism what crosses are to vampires. Skeptics might say it's just a coincidence that glasnost and perestroika came just after the photocopier, the fax, and the personal computer invaded Russia, but I think there's a connection, and if you read WIRED, you probably do too. After all, how could any country whose power structure was based on controlling the flow of information survive in an era of direct-dial phones and ubiquitous fax machines?

Now (or so the argument goes), any nation that wants a modern economy has to have information technology - so economic modernization will inevitably lead to political reform, right?

I went to China expecting to see that process in action. I

looked everywhere for hardy electronic frontierfolk, using their modems and fax machines to push the Communists back into their holes, and I asked dang near everyone I met about how communications technology was changing Chinese culture.

None of them knew what the fuck I was talking about.

I was carrying an issue of WIRED so that I wouldn't have to explain it to everyone. It happened to be the issue with Bill Gibson on the cover. In one corner were three characters in Hanzi (the script of the Han Chinese). Before I'd left the States, I'd heard that they formed the Chinese word for "network."

Whenever I showed the magazine to a Chinese person they were baffled. "It means network, doesn't it?" I said, thinking all the warm and fuzzy thoughts that we think about networks.

"Yes," they said, "this is the term used by the Red Guards during the Cultural Revolution for the network of spies and informers that they spread across every village and neighborhood to snare enemies of the regime."

See what I mean? Same idea, different implementation.

Our concept of cyberspace, cyber-culture, and cyber-everything is, more than we care to realize, a European idea, rooted in Deuteronomy, Socrates, Galileo, Jefferson, Edison, Jobs, Wozniak, glasnost, perestroika, and the United Federation of Planets. This statement may be read as criticism by people who like to trash Western culture, but I'm not one of those. For a Westerner to trash Western culture is like criticizing our nitrogen/oxygen atmosphere on the grounds that it sometimes gets windy, and besides, Jupiter's is much prettier. You may not realize its advantages until you're trying to breathe liquid methane.

CNN has been running ads for an American company that had been doing business in China - one of those nauseatingly self-congratulatory numbers we saw so much of after the fall of the Iron Curtain. The ad shows us exotic temples, mist-shrouded mountains, twangy music, adorable children. It's so effective that whenever I see it I have to get out my Tiananmen picture book and take a look at the picture of the

Chinese pro-democracy student lying in a fetal position, his brains sprayed across the pavement by a tank that ran over his head.

There is a common Western assumption that China is taking an economic path to a more open society, and in large part it's based on the cultural biases of people who remember Leonard Bernstein conducting Beethoven's 9th at the Brandenburg Gate and who reckon that the same thing must be going on in China. These people like to say that China's trying to emulate South Korea or Singapore. But I'd say Haiti or Guatemala is more like it.
This article is the result of a two-week trip to Hong Kong, Shenzhen, and Shanghai during September '93, during which I tried to get some sense of how the Chinese perceived the influence of technology - particularly digital technology - on their culture.

The answer is that this issue hasn't occurred to the Chinese yet, and probably never will, because it basically stems from a Western, post-Enlightenment perspective. Going to China and asking people about the Hacker Ethic is like going to Peoria and talking to the folks down at Ned's Feed & Grain about Taoism. The hacking part comes to them easily enough - China is, in a sense, a nation of analog hackers quickly entering the digital realm. But I didn't see any urge to draw profound, cosmic conclusions from the act of messing around with technology.

Shenzhen has the look of an information-age city, where location is basically irrelevant. Unlike, say, Shanghai (which is laid out the old-fashioned way, on an armature of heavy industry and transportation lines), Shenzhen seems to have grown up without any clear central plan, the office blocks and residential neighborhoods springing into being like crystals from a supersaturated solution. Think of the difference between Los Angeles and New York City, and you might get a general idea of what I mean. Streets tend to be straight, wide, and many-laned, with endless iron fences running down the middle so that pedestrians and bicyclists are forced, against all cultural norms, to cross only at major intersections. Shenzhen has more cars and fewer bicycles than most Chinese cities. This has shifted the balance of power somewhat; in, say, Shanghai, mobs of bicyclists play chicken with the cars and frequently

win. But in Shenzhen they stand defeated on the curbs, waiting for the light to change. Occasionally some young scoundrel will dart out and try to claim a lane and be driven back by taxi drivers, scolding him with horns and shaking fingers.

Even on a humid day (which is to say, every day) the place is rather dusty, like a construction site where things haven't been tamped down yet. Houses are rare, though there is one district that looks something like an American suburban housing development, albeit more tightly packed. But this one looks like it's been abandoned and then recolonized by survivalists: Every house is surrounded by a high wall topped with something sharp, and if you peer between the iron bars of the gates, you can see that the windows and patio doors of the houses are additionally protected by iron bars and expanding metal security gates. Beyond that, everyone lives in high-rises.

On every block in central Shenzhen, clean new high-rises protrude from organic husks of bamboo scaffolding. Nissan flatbed trucks rumble away from the waterfront stacked with sheets of Indonesian mahogany plywood on its way to construction sites, where it will be used in concrete forms and then thrown away. The darkness is troubled by the report of nocturnal jackhammers, and all-night arc-welders hollow immense spheres of blue light out of the translucent, steamy atmosphere.

Only a quarter mile away from this scene of hysterical development, a green hillside rises, covered with an undisturbed mat of tropical vegetation and empty except for an ancient cemetery. It doesn't make sense until you realize that you're looking across the Shen Zhen into Hong Kong territory. Running parallel to the river is a border defense system meant to keep the mainland Chinese out. A chain of sodium-vapor lamps and a high fence topped with razor ribbon cuts across lakes and wetlands that have become wildlife refuges by default.

The population of Shenzhen is 2.6 million. Thirteen years ago it was two thousand. The growth rate of Guandong Province, which includes the Pearl River Delta, is the highest in the world.

It would be a lot higher if not for the Second Border that separates the Special Economic Zone from the rest of China.

When you're leaving Shenzhen you simply cruise through a chute without stopping. When you recross the Second Border on your way back, it's a different story.

The highway broadens into a vast slab of pavement covered with fine red dust from the Pearl Delta's devastated hillsides. You and all other passengers have to bail out and pick your way hazardously through traffic until you've reached the border station.
Here you are funneled through one of many parallel lanes and checked out by a man in a uniform. If you're a Westerner, they don't even bother to look at you. If you look Chinese, you may have problems. A non-Chinese passport will get you through, of course, unless it's a British passport from Hong Kong; since the PRC doesn't recognize the legitimacy of Hong Kong, such people have to get a special document that serves the function of a passport inside the PRC.

If you are mainland Chinese, you don't get through unless the government has given you permission to live in the Special Economic Zone. Generally, such permission is only given to the young and college-educated. So Shenzhen has its own corrugated shantytowns of illegal immigrants, sitting in plain sight next to major highways, in the occasional patch of land that hasn't been covered with high-rises or factories yet. Apparently the Shenzhen authorities have the same schizophrenic attitude to the illegals that many Germans do - they're tolerated as long as they're convenient.

Many Shenzhen residents would, of course, love to get across the river into Hong Kong, which has its own such neighborhoods. And many residents of Hong Kong are scrambling to get passports from Canada, the US, or the UK. Once they've secured non-PRC passports, they frequently come back to Shenzhen to start and manage businesses, staying in luxury condos built specifically for them by the city fathers. Seen through all these concentric barriers, the Overseas Chinese (ethnic Chinese returning to their homeland) must seem infinitely remote to the peasants being turned away at the Second Border. Locals call them the "spacemen."

Shenzhen is touted as an experiment in free enterprise, both by the government of the PRC and by an especially fatuous breed

of Western free-market evangelist - people who think that a free market will lead to a free society. This gets us into some awkward questions of just what we mean by the word "free."

I wasn't able to get out to any of the slave labor camps, where many Chinese are hard at work cranking out exportable trinkets, but I did meet plenty of real-life indentured servants. After June 4th (which is how the Chinese always refer to the crushing of the Tiananmen demonstration) the government instituted a new program whereby any student who graduated from college was deemed to owe the government five years of service, at a place and in a job to be chosen by, you guessed it, the government. Needless to say, this is a handy way for the government to control the behavior of that frisky Tiananmen generation, while also giving government enterprises, and Sino-foreign joint ventures, a handy recruitment system.

Shenzhenese are proud of their railway terminal, which is a good quarter-mile long and ten stories high, clad in mirrored glass. Centered high on the side of the building, enormous in red neon, are the Hanzi characters for Shen Zhen, drawn in a rather spidery hand. Supposedly the calligrapher was none other than Deng Xiaoping. He launched the SEZ thirteen years ago, then swung through recently and spoke the immortal words "I like this," which has led to the founding of more SEZs in other parts of China.

I wandered through the hall where passengers line up to buy tickets, if they haven't already bought them from the cellphone-brandishing wise guys loitering outside. The space was regularly interrupted by heavy structural pillars, three or four feet on a side, sheathed in white stone.

A gaping hole had been kicked in one of them, revealing that the "pillar" was actually a column of air with several naked strands of inch-and-a-half-thick rebar wandering through it. Holes had been kicked in other pillars by inquisitive passengers, affirming that the builders had not bothered to pour a single tablespoon of actual concrete.

Paul Lau, a Hong Kong-based photographer, accompanied me. "Corruption," he said, shaking his head in exasperation like a farmer who's just discovered a cutworm infestation in his field.

Corruption in China is no secret, but the way it's covered in Western media suggests that it's just an epiphenomenon attached to the government. In fact, corruption is the government. It's like jungle vines that have twined around a tree and strangled it - now the tree has rotted out and only the vines remain. Much of this stems from the way China is modernizing its economy.

If you thought zaibatsus were creepy, if Singapore's brand of state-backed capitalism gives you the willies, wait until you see the Sino-foreign joint venture. The Russians, in their efforts to turn capitalist, have at least tried to break up some of the big state monopolies and privatize their enterprises - but since China is still Communist, there's no reason for any of that nonsense. Instead, foreign companies form joint ventures with enterprises that are still part of the government - and, of course, everything is part of the government.

On every block you see an entrepreneur sitting at a sidewalk card table with one or two telephones, jury-rigged by wires strung down an alley, up the side of a building, and into a window. There is a phone book, a price chart, and a cigar box full of cash (in Shenzhen, always Hong Kong dollars). Some fastidious operators have a jar full of mysterious disinfectant with which they wipe down the mouthpiece and even the buttons after each customer is finished. Most of these enterprises also feature a queue of anywhere from one to half a dozen people. The proprietor will step in and cut long-winded customers off, especially if someone in the queue makes it worth his while.

All of the phone wiring is kludgey. It looks like everyone went down to Radio Shack and bought reels of phone wire and began stringing it around, across roofs, in windows, over alleyways. Hundreds of wires explode from junction boxes on the sides of apartments, exposed to the elements.

I was checking out some electronics shops along one of Shenzhen's wide avenues. Above the shops were dimly lit office spaces housing small software companies or (more likely) software departments of Sino-foreign joint ventures. If there was a Chinese silicon valley, this was it. I wandered into an

alley - the Silicon Alley, perhaps - and discovered a particularly gnarly looking cobweb of phone wires. Paul Lau started taking pictures of it. Within moments, a couple of attentive young Chinese men had charged up on bicycles and confronted him.

"Are you a reporter?" they demanded.

"No, I'm an artist," Paul said, leaving them too stunned to make trouble. The lesson I learned from this is that a sophisticated Hong Kong Chinese knows how to use the sheer force of culture shock to keep his mainland cousins at bay. The Shenzhenese are pretty worldly by Chinese standards, but compared to the Hong Kong Chinese, who may be the most cosmopolitan people on earth, they are still yokels. This cultural disparity is about the only thing Hong Kong has going for it as 1997 approaches; but more about that later.

Everyone has a pager. Expensive models have LCD screens that can display Hanzi characters. Cheap ones display a few digits. If you have one of these, you carry a tiny chart listing a couple of hundred of the most common Chinese surnames, each one with a numerical code. When you're paged, you read the number off the screen and refer to the chart to find the name of the caller.

If you own stock on the Shenzhen exchange, you can cut a deal with your pager company that will cause the price of that stock to appear on your pager twice a day, at 10:00 and 4:00. And the pager doubles as an alarm clock; your company will give you a wake-up page every morning if you request it.

Even people who carry cellphones carry pagers, which confused me until I found out that most of the cellphones I was seeing aren't really cellphones at all; they are CT2 phones, which are cheaper and operate over a much shorter range. On a CT2, you can call out but you can't receive calls, so you have to carry a pager. To cover a metropolis with CT2, tens of thousands of base stations would be needed. Coverage in Shenzhen is still spotty. When you see half a dozen young men loitering on the front steps of a building shouting into their prawns, you know there must be a CT2 station inside.

Roughly speaking, Shenzhen is the southern anchor of a

crescent of development running along the vast semicircular region that bulges into the South China Sea. At the northern end of the crescent lies Shanghai, the largest city in China, and, until the Communist takeover, the only Chinese city that could compete in wealth and sophistication with Hong Kong.

Motorola runs one of the two cellphone networks in Shanghai. The local chief is a young American named Bill Newton, who came here a few years ago with two other people and worked around the clock at first - like new immigrants, he says, who've just come to America and have nothing to do but work. Now he's managing 55 employees; he's the only American. He thinks everyone should want his job: "To be in one of the fastest growing companies in one of the fastest growing sectors of the fastest growing economy in the world - how many times in your life is that going to happen?" In the context of Shanghai, "fast growing" means, for example, that cellular phone service is growing at 140 percent a year and pager use at 170 percent a year.

Motorola's offices are in the international center west of downtown Shanghai - the modern, high-rise equivalent of the Western enclaves where capitalists used to do business in the old days. It's got a Shangri-La luxury hotel, it's got modern offices identical to those you'd see in any big American city, it's got living quarters with purified water. Newton and I got in a taxi and took a long drive to the headquarters of the Shanghai Post and Telecommunications Administration (PTA) - Mao Bell, if you will.

Driving in Shanghai is like shouldering your way through the crowd at an overbooked trade convention. There's never any space in front of your vehicle that is large enough to let you in, so you just ooze along with the traffic, occasionally claiming a few extra square yards of pavement when the chance presents itself. I'm hardly the first Westerner to point this out, but the density of bicycle and foot traffic is amazing. I'm tempted to write that the streets are choked with bicycles, but, of course, the opposite is true: All those bicycles are moving, and they're all carrying stuff. If the same stuff was being moved on trucks, the way it is in, say, Manhattan, then the streets would be choked.

Everyone is carrying something of economic value. Eviscerated pigs slung belly-up over the rear tire; bouquets of scrawny, plucked chickens dangling from racks where they get bathed in splashed-up puddle water; car parts, mattresses, messages.

In network jargon, the Chinese are distributed. Instead of having One Big Enterprise, the way the Soviets did, or the way we do with our Wal-Marts, the Chinese have millions of little enterprises. Instead of moving stuff around in large hunks on trucks and trains, they move it around in tiny little hunks on bicycles. The former approach works great in say, the Midwestern US, where you've got thousands of miles of nearly empty interstate highways and railroad lines and huge chunks of rolling stock to carry stuff around. The latter approach works in a place like Shanghai.

The same problems of distribution arise in computer networks. As networks get bigger and as the machines that make them up become more equal, the whole approach to moving information around changes from centralized to distributed. The packet-switching system that makes things like Internet work would be immediately familiar to the Chinese. Instead of requisitioning a hunk of optical fiber between Point A and Point B and slamming the data down it in one big shipment, the packet data network breaks the data down into tiny pieces and sends them out separately, just as a Chinese enterprise might break a large shipment down into small pieces and send each one out on a separate bicycle, knowing that each one might take a different route but that they'd all get there eventually.

Mao Bell is responsible, among other things, for setting up such data networks in China. The Shanghai headquarters is on the waterfront of the Huangpu river between the Shanghai stock exchange and a tall hotel used during the war by the Japanese as a high-rise concentration camp. A woman sits in the tiny lobby with her telephone and her jug of disinfectant, and allows you to call upstairs to announce yourself. A tiny, rickety elevator descends, hoists you up a few floors, and deposits you in a long corridor without artificial light. Some illumination enters through windows and glances down the shiny floor, but it's the gloomy steel-gray light of a northern industrial city. You'd never know that Mao Bell takes in over US$7 billion a year and that revenues are growing by something like 60 percent a year.

A bit of a spelunking expedition through these corridors takes you into a classic communist-style meeting room, the kind of place Coleridge might have been thinking of when he wrote of "caverns measureless to man." In this part of the world, the heavy hitters show up for meetings with large retinues of underlings, and all of them have to have a seat at the table, so the tables go on for miles. I established a foothold in a corner near the door and was met by Gao Kun, director of the import office of the Shanghai PTA, comfortable in a short-sleeved shirt. Gao, bless him, was the only government official who would talk to me the whole trip - the PRC was still pissed off at the Great Hegemon (as they now call the US) about that incident in the Persian Gulf a few months back when our guys stopped and boarded a Chinese freighter allegedly full of chemical warfare ingredients. They found nothing.

Gao calmly rattled off a fairly staggering list of statistics on how rapidly the phone system there is growing - half to three-quarters of a million lines added per year for the foreseeable future. All of their local exchanges are webbed together with fiber, and they're running fiber down the coast toward Shenzhen. They're setting up packet-switching networks for their customers who want them - banks, import/export houses, and the like. The cellular and CT2 networks are also growing as rapidly as technology allows. He buys scads of high-bandwidth technology from the West and is actually trying to set up a sort of clearinghouse near Shanghai where Western manufacturers could gain access to the potentially stupendous Chinese market through a single point, instead of having to traffic separately with each regional PTA.

Gao is baffled by the fact that the US makes all the most advanced technology, but our government won't allow him to buy it. He asked me to explain that fact. I didn't suppose that haranguing him about human rights would get me anywhere, so I mumbled some kind of rambling shit about politics.

He explained to me, through his interpreter, that the slogan of Shanghai PTA is "destroy the users on the waiting list." Indeed, it's the job of people like Gao to extend the net into every cranny of the society, making sure everyone gets wired. When nobody had phones, he says, nobody really missed them; the

very few people who had them in their homes viewed them primarily as a symbol of status and power. Now, 61 percent of his customers are residential, everyone views it as a basic necessity of life, and Gao's company has to provide them with more services, like direct dial, pagers, and so on. Cellphones, he said, are so expensive that they're only used by businessmen and high-ranking officials. But the officials are uneasy with the whole concept because they have to answer the phone themselves, which is seen as a menial chore. I told him that in Hong Kong, businessmen walk down the streets followed at a respectful distance by walking receptionists who carry the phones for them. Gao thought that was pretty funny.

In one Chinese city, a woman spends all day running a sidewalk stand and keeping one eye on a construction project across the street. The construction project is backed by a couple of people who were running a software counterfeiting operation to the tune of some tens of millions of dollars until they got busted by Microsoft. They hid their money and have been sinking it into the real estate project. Microsoft is paying the woman a lot of money (by the standards of a Chinese sidewalk vendor) to watch the site and keep track of who comes and goes. She has a camera in her stand, and if the software pirates ever show up there and she takes a picture of them, she gets a whopping bonus, plus a free trip to the United States to testify.

Microsoft runs an office in Hong Kong that is devoted to the miserable task of trying to stop software piracy in Asia. In addition to running their undercover operation in the sidewalk stand, they are targeting a number of operations in other countries, which probably provides a foretaste of what's going to happen in mainland China a few years down the road.

Most East Asian countries have sort of a stolen intellectual property shopping mall where people sit all day in front of cheap computers swapping disks, copying the software while you wait - the vaunted just-in-time delivery system. After a few of these got busted, many switched to a networked approach. One guy in Taiwan is selling a set of 7 CD-ROMs containing hundreds of pirated programs. He has no known name or address, just a pager.

Taiwan, the most technologically advanced part of Greater

China, makes a lot of PCs, all of which need system software, so there the name of the game is counterfeiting, not pirating. MS-DOS and Windows are, naturally, the main targets. Microsoft tried to make the counterfeiters' job harder by sealing their packages with holograms, but that didn't stop the Taiwanese - they made a deal with the Reflective Materials Institute at, you guessed it, Shenzhen University, which cranked out hundreds of thousands of counterfeit holograms for them.

It often seems that, from the point of view of many entrepreneurial souls in East Asia, the West's tight-assed legal system and penchant for ethical dithering have left many inviting niches to fill. Perhaps this explains their compulsion to enter such perfectly sensible fields as driftnet fishing, making medicines from body parts of nearly extinct species, creative toxic waste disposal, and, above all, the wholesale, organized theft of intellectual property. It's not just software, either - Indonesia has bootleg publishers who crank out counterfeit bestsellers, and even Hong Kong's Saturday morning TV clown wears a purloined Ronald McDonald outfit.

This has a lot to do with the collective Chinese approach to technology. The Chinese were born to hack. A billion of them jammed together have created the world's most efficient system for honing and assimilating new tech (they actually view Americans as being somewhat backward and slow to accept new ideas - the Chinese are considered, as Bill Newton put it, "not so much early adopters as rapid adopters"). As soon as someone comes up with a new idea, all the neighbors know about it, and through an exponential process that you don't have to be a math major to understand, a billion people know about it a week later. They start tinkering with it, applying it to slightly different problems, trying to eke out hair-thin improvements, and the improvements propagate across the country until everyone's doing things the same way - which also happens to be the simplest and most efficient way. The infrastructure of day-to-day life in China consists of a few simple, cheap, robust technologies that don't belong to anyone: the wok, the bicycle, various structures made from bamboo and lashed together with strips of rattan, and now the 286 box. A piece of Chinese technology, whether it's a cooking knife or a roofing tile, has the awesomely simple functionality of a piece of

hand-coded machine language.

Introducing non-copy-protected software into this kind of an environment may be the single most boneheaded thing that American business has ever done in its long history of stepping on rakes in Asia. The Chinese don't draw any mystical distinctions between analog and digital tech; whatever works, works, and so they're happy to absorb things like pagers, cellphones, and computers if they find that such things are useful. I don't think you find a lot of Chinese expressing hostility toward computers or cellphones in the same way that technophobic Americans do. So they have not hesitated to enshrine the pager, the cellphone, and the 286 box in their pantheon of simple, ubiquitous technology, along with the wok, the bicycle, and the Kalashnikov assault rifle.

While avoiding technophobia, they've also avoided techno-fetishism for the most part. They don't name their computers "Frodo," and they generally don't use them to play games, or for anything more than keeping the accounts, running payroll, and processing a bit of text. In China, they treat computers like they treat dogs: handy for a few things, worth having around, but not worth getting overly attached to.

Shanghai's computer stores were all completely different. One place had a pathetic assortment of yellowed stuff from the Apple II Dynasty. Another specialized in circuit boards, catering to do-it-yourselfers. There were several of what we'd call box movers: stores crowded with stacks of brand-new 486 boxes and monitors. And I found one place hidden way off the street in a giant old Western-style house, which I thought was closed at first because all the lights were off and no one seemed to be there. But then people began to emerge from the shadows one by one and turn on lights, one fixture at a time, slowly powering up the building, shedding light on an amazing panoply of used computers and peripherals spanning the entire history of the industry. In more ways than one, the place was like a museum.

Spend a minute or two watching a Chinese person enter Hanzi characters with a Western keyboard, and you'll understand that the Chinese won't ever use computers as much as we do, or at least in anything like the way we use them, because - to put it in a nutshell - Chinese is a lousy language for Scrabble. The

most popular system of text entry works like this: the user types in the Pinyin version of a word (that is, its spelling in the Roman alphabet). All of the Hanzi characters so transliterated then appear on the screen - sometimes there can be dozens - and the user chooses the desired one by punching in its number on the list. Then it appears on the screen - sort of. CRTs don't have enough resolution to display the more complicated characters, so the screen fonts consist of simplified versions, and the reader has to puzzle out the identity of a character from its context. Imagine how much time you'd spend computing if you had to transliterate each word into Thai, type it in on a Thai keyboard, pick the right word from a list, and then view the results through a sheet of frosted glass that blurred most of the letters, forcing you to guess the words from their general shape and context.

Shanghai Ikarus Ltd. is run by one Gu Guo-An, who has put in some time at Stanford and Xerox PARC. Its bread and butter is desktop publishing for the Shanghai business community, but in the back rooms Gu is up to more interesting things: his company is the first in the Chinese-speaking world to develop outline fonts, both for the traditional system still used in Taiwan (some 13,000 characters) and the simplified system of the PRC (6,763 characters). They're putting together a set of TrueType characters now - all day long, the employees in the back rooms are busy tugging those pesky control points around the screens of brand-new Mac Centrises.

Forget about PCs with Western keyboards hooked up to modems. When you combine a mind like Gu's with the advent of pen-based computers, which work with non-Scrabbleophilic languages; PDAs capable of shooting messages back and forth via infrared or radio; the rapid growth of the phone system, both wired and wireless; and the obvious Chinese love for pagers, portable phones, or any other gadget that makes them connected, suddenly the future of computers there begins looking very different from the Western approach.

If you look a decade or two down the road, it's possible to imagine a future in which non-Westernized Chinese finally have the opportunity to use computers for the highest and best purpose we have ever found for them: goofing off. This is terribly important, because goofing off with computers leads to

hackers, which leads to the hacker mentality, which takes us to other interesting places.

Whether the Chinese are interested in goofing off is another story. I saw a lot of computers in China, but I didn't see a single computer game. The idea of sitting by yourself in front of a machine doesn't seem to do much for them; it does not gibe with their concept of having fun. It's not a culture that encourages idiosyncratic loners.

There are plenty of historical examples to back up the proposition that we won't see any Hacker Ethic in China. The country has a long history of coming up with technologies before anyone else and then not doing a lot with them; a culture 5,000 years old prefers to bend new technologies to its own ways.

I got around Shanghai in a nondescript white Ford. Because of its high fuel consumption, the driver called it the "Oil Tiger." Whenever it ran low, he was compelled by certain murkily described safety regulations to leave me a block away from the fuel pumps while he filled it up, which imparted an air of drama to the procedure.

One day, on the outskirts of Shanghai, I stumbled across a brand-new computer store with several large floral arrangements set up in front. A brass plaque identified it, imposingly enough, as the Shanghai Fanxin Computer System Application Technology Research Institute. Walking in, I saw the usual rack full of badly printed manuals for pirated software and a cardboard box brimming with long red skeins of firecrackers. The place was otherwise indistinguishable from any cut-rate consumer electronics outlet in the States, with the usual exception that it was smaller and more tightly packed together. There were a couple of dozen people there, but they weren't acting like salespeople and customers; they were milling around talking.

It turned out that they had just opened their doors something like an hour before I arrived. I had accidentally crashed their opening-day party. Everyone stood around amazed by their good fortune: a writer for an American technology magazine showing up for their grand opening!

Dai Qing, the director, a young blade in an oversized suit, beckoned me into the back room, where we could sit around a conference table and watch the front through a large window. He bade a couple of females to scurry out for slices of cantaloupe and mugs of heavily sweetened coffee, and gave me the scoop on his company. There are 21 employees, 16 of whom are coders. It's a pure entrepreneurial venture - a bunch of people pooled their capital and started it rolling some three years ago. The engineers mostly worked in state enterprises or as teachers where they couldn't really use their skills; now they've developed, among other things, an implementation of the Li Xing accounting system, which is a standard developed in Shanghai and used throughout China.

The engineers make some 400 yuan per month, which works out to something like $600 a year at the black market exchange rate. This is a terrible salary - most people in Shanghai can rely on making four times that much. But here, the coders also get 5 percent of the profits from their software.

You can't pick out the coders by looking at them the way you can in the States. The gender ratio among coders is probably similar. Everyone is trim and nicely but uninterestingly dressed. No extremes of weight, facial hair, piercings, earrings, ponytails, wacky T-shirts, and certainly no flagrantly individualistic behavior. In other words, there's no evidence that being good at computers has caused these people to think of themselves as having a separate identity from other Chinese in the same wage bracket.

By the time I'd gotten out the door, the software engineers had already rolled a couple of dozen strings of firecrackers across the sidewalk. As soon as I jumped out of the way, they started lighting the fuses with their cigarettes (another habit not common among US hackers), and everything went off in a massively parallel barrage, covering the sidewalk in dense smoke and kicking up a blizzard of shredded red paper. Several more coders came out carrying mortars and began launching bombs into the air, holding the things right in front of their faces as they disgorged fireballs with satisfying thuds. The strings of fireworks kept blowing themselves out, so as I backed slowly toward the Oil Tiger I was treated to the sight of excited

Chinese software engineers lunging into the firestorm holding their cigarettes out like fencing foils, trying to reboot the strings without sacrificing eyes, fingers, or eardrums.

Back in Shenzhen, when I'd had about all I could take of the Special Economic Zone, I walked over a bridge across the Shen Zhen and found myself back in the British Empire again, filling out forms in a clean well-lit room with the Union Jack flying overhead. A twenty-minute trip in one of Hong Kong's quiet, fast commuter trains took me through the New Territories, mostly open green land with the occasional grove of palm trees or burst of high-rise development, and into Kowloon, where I hopped into a taxi.

On the approach to the tunnel between Kowloon and Hong Kong, stuck in traffic beneath a huge electronic billboard showing animated stock market graphs in white, emerald, and ruby, I gazed into the next lane at a brand-new gray BMW 733i, smooth and polished as a drop of molten glass. Behind the wheel was a Chinese man, affluently fleshy. He'd taken off his suit jacket to expose a striped shirt, French cuffs, the cuff links flashing around the rim of the steering wheel. In the passenger seat to his left sat a beautiful young woman who had flipped her sunvisor down, centering her face in a pool of light from the vanity mirror; as she discussed the day's events with the man, she deftly touched up her Shiseido - not that I would have guessed she was wearing any, and not that she seemed especially vain or preoccupied. The BMW kept pace with my taxi through the tunnel and then the lanes diverged. I couldn't help wondering what the hell was going to happen to this place when it becomes part of the People's Republic in 1997. Needless to say, a lot of Hong Kong residents are wondering the same thing.

The working class there doesn't speak English, but the computer-owning classes do, and the place is heavily networked. Larry Riley and James Campbell, Australian and Sri Lankan respectively, are the tech reporters for the South China Morning Post, and they've started a magazine called The Dataphile, which lists some 700 BBSes in Hong Kong, most reachable via FidoNet - including boards for Communists, Methodists, Programmers, and Accountants.

Until recently it hasn't been easy for these people to hook into the Internet, but gateways are opening up. Aaron Y. T. Cheung is the executive director of Hong Kong Internet & Gateway Services Ltd., which has just leased a line between Hong Kong and California. If anyone's going to be the informational mogul of South China, it's probably Cheung. He's a compact, solid, sunny, energetic guy, trained at the University of Minnesota, and jammed with so much information about optical fiber, telecommunications policy, baud rates, Chinese politics, packet data networks, and other arcana that he can hardly get the information out of his mouth fast enough.

Now, not to put too fine a point on it, but in a very few years, Riley and Campbell and Cheung, the 700 sysops of the Hong Kong boards, and all of their subscribers are going to go to bed free men and women and wake up subjects of an unimaginably corrupt totalitarian dictatorship whose concept of a legal system is to blow the offender's head off with a revolver and then send the victim's mother a bill for the bullet (27 fen, or about a nickel). Is China going to eat Hong Kong alive, or is Hong Kong going to impregnate its new host with more new memes than it can deal with?

Let's start with the first possibility.

Cheung's got a copy of some 10 Mbytes of traffic from soc.culture.china that appeared between the first hunger strikes in Tiananmen in mid-May and the end of June. Ninety percent of it is from from overseas Chinese in universities and tech companies in the States, who typically act as intermediaries between the Net and their friends in the PRC. It would be nice to report that the Net played some crucial role in the democratic demonstrations leading up to June 4th, but in Cheung's opinion it didn't create any impact of any kind - fax played a greater role. Still, fax is part of the Greater Network.

Cheung wants to extend the Net into China, and a lot of Chinese badly want him to do it -not because they want to read the latest on alt.sex.bondage but because they want to network their offices together, in China and other parts of Asia, without having to lease lines.

But the telcos are part of the government, and there's the rub.

The tech he's peddling is just as powerful as the telcos' packet data networks, so an outfit like his, once it gets its hands on leased lines connecting various countries, represents a competitive threat to Mao Bell, and to the numerous other immense Chinese ministries who are setting up networks of their own and trying to compete with Mao Bell. So, given the way business is done in the area, it's not likely that the governments will let him in (to China or any other Southeast Asian country besides Hong Kong) anytime soon.

Cheung doesn't see electronic media exposing a lot of people in China to new ideas. He points out that political change in China tends to come from the bottom up, when the masses go voluntarily and spontaneously into the streets, all echoing and sharing one another's feelings. For reasons already discussed, it's going to be a long time before the Net reaches the Chinese masses. So Cheung doesn't think that electronic communications will cause any political changes in China except insofar as the free flow of information tends, over a long period, to make the economy more productive and lead to the development of a middle class.

The fact is that the Net can only reach people who have imbibed a lot of Western culture already - you can't even enter text unless you know the Roman alphabet. As far as the masses are concerned, the Net might as well not exist - the only important source of Western memes is television. In a sense, this is terrible news, because we all know what bilge television is. At the same time, the peculiar power of Western culture to colonize unlikely places may be the only thing Hong Kong has going for it.

So let's think about the second possibility, which is that Hong Kong, far from being obliterated, will become the informational capital of mainland China - in other words, that the power of media will overcome, or at least balance, the tanks and guns dispatched from Beijing.

People who think that America has a monopoly on gratuitous TV violence have never watched what the Hong Kong stations radiate across the Pearl Delta every night between 7 and 10. Their fake blood technology is decades behind ours, but that doesn't seem to bother this audience. The carnage is, of

course, frequently interrupted by ads, which also appeal to folks who are fairly new to the idiot box. In my favorite TV ad, Beethoven's "Ode to Joy" was played as front-end loaders fed boulders into a giant crusher and whole segments of mountainside were blasted into rubble. And the Mitsubishi ads looked like what you'd get if you hired Leni Riefenstahl to plug consumer electronics.

It works. The parvenus in Shenzhen watch ultraviolent flicks in their rooms at the Shangri-La with the sound turned all the way up, whooping helplessly with laughter, like the Beverly Hillbillies passing a jug of moonshine during a 24-hour Beavis and Butt-head marathon. And in the devastated landscape between Shenzhen and Guangzhou - beyond the Second Border - countless bulldozer operators spend their days clawing maniacally at the verdant hillsides, their cockpits lined with posters of their favorite Hong Kong starlets, and the horizon is prickly with television antennas.

Some unimaginative sorts have described this as cultural imperialism. When millions of Chinese spend their scant yuan on putting antennas up to pull in snowy programs from Hong Kong, that's us nasty Westerners being imperialistic, you see.

It's not imperialism. It's what happens when a culture with a sophisticated immune system comes into contact, as it inevitably will, with a culture without one. The Chinese have a completely different relationship to the world of ideas than Westerners do - it seems that they either take an utterly pragmatic approach, paying no attention to abstract ideals at all, or else they go nuts with it, the way they did in the Taiping Rebellion (when Chinese Christians went out of control in the 19th Century and sparked a very nasty civil war) and again during the Cultural Revolution (and let's remember that Communism is, after all, another Western import). I'm not sure what happens to such a country when radical Maoism is replaced by the far more seductive meme of Western consumer culture, as purveyed by the Hong Kong television stations.

I don't imagine we'll see anything as dramatic as the Taiping Rebellion or the Cultural Revolution again; I suppose it will be something like what's happening in the States right now: an abandonment of the value system that has traditionally made

the society work. This probably won't improve matters in China, and I wouldn't be surprised to see a violent backlash.

It can be argued that the same consumer culture is in the process of dragging American civilization down the toilet, making us more nihilistic, less educated, less respectful of our own civilization in general. It's the smallpox of our time - it's hurting us badly, but we survive because we've got some immunities. Nobody over the age of three believes most of what they see on the tube. When we export it, though, cultures get flattened.

The influence of Western culture has a long way to go before it reaches its peak in China, but the early signs of a backlash are already developing. After I left, the government announced it was cracking down on private ownership of satellite dishes and intensified its regulation of the pager and cellphone business. The excuse was that these things were letting in too much Western culture (thanks in part to Star TV's Rupert Murdoch, who runs five channels out of Hong Kong). As the Economic Daily, an official publication of the People's Republic of China, put it: "If China's information system is spread about and not grasped firmly in hand, how can people feel safe?" Of course, one of the major players in these industries is the People's Liberation Army, so it's also largely a turf war; but at some point they'll have to put a stop to the spread of Western culture, in the way that Singapore, Saudi Arabia, and even France have recently tried to do.

The provinces have a lot of power in China. They negotiate with the central government over how much of their tax revenues will be sent off to Beijing. As a result, China's central treasury came within a hair's breadth of running empty in mid-1993, scaring the bejesus out of the government. In order to get the provinces under control they will have to reform their tax system and radically reinforce the power of the central government, which the provinces won't like.

Say what you will about the power of media and of information technology; the fact is that when a few million ravenous peasants come swarming into the cities with AK-47s, all the cellphones and fax machines in the world aren't going to help the people who've been enjoying the good times in the

double-bordered free-enterprise wonderland of Guandong Province. The Han Chinese didn't get to be the all-time world champion ethnic group by being nice guys or by docilely soaking up every foreign idea that came along.

The Network is spreading across China, getting denser and more sophisticated with every kilometer of fiber that goes into the ground. We'd like to think of it as the grass roots of democracy, but the Chinese are just as apt to think of it as a finely engineered snare for tying the whole country together even more firmly than its predecessor, the human Net of the Red Guards. Looking at all the little enterprises that have sprung up in Shenzhen to write software and entertain visiting spacemen, it's easy to think that it's all the beginning of something permanent. But a longer historical perspective suggests that it's only a matter of time before the northerners come pouring down through the mountain passes to whip their troublesome southern cousins back into line.

I'm no China expert. But everything I saw there tells me that, in China, culture wins over technology every time. Sometime within the next couple of decades, I'm expecting to turn on CNN (or BBC if I can get it) and see a jittery home videotape smuggled out of South China, showing a heap of smashed and burning cellphones, satellite dishes, and television sets piled up in a public square in Shenzhen, and, as backdrop, a giant mural portraying a vigorous new leader in Beijing.