Issue Two: Winter 1994
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Applying Marx's Theory of Value: The Role of Knowledge in the Production of Commodities

By Jim Davis and Mike Stack
Cy.Rev Editorial Board

A common problem in discussing "knowledge" as a factor in production is determining its "value," and what value it adds to goods during production. Toffler, for example, says, "Knowledge adds value."

But what is "value?" An economics textbook defines "value added" as simply "the revenue from selling a product minus the amounts paid for goods and services purchased from other firms." This definition is unsatisfactory. Is "value" only realized through the "selling" and the "purchasing"--that is, only in the realm of circulation? What about the production process? Is value really only tied to the vagaries of fluctuating supply and demand? What if the "goods and services" can't be sold, say, because potential users do not have the money to purchase the product? Does the product therefore have less (or no) value?

Recognizing the central role of commodities in capitalism, Marx began Capital with an extended analysis of the question of the "value" of commodities. He identified two different kinds of "value" in commodities. In order to be exchanged, a commodity must fulfill some need or want for another human being. Marx called this subjective and qualitative aspect of a commodity its use value. At the same time, in order to exchange goods of different use values, Marx argued that there needs to be some common basis of assessing a value of the commodities, some quantitative, measurable aspect. Marx identifies "socially necessary labor" as that "thing" common to all commodities. It represents the amount of abstract human labor added during production, and the "dead" labor embodied in the raw materials and machinery used up during production. Marx called this aspect of commodities exchange value. The purpose of production, the reason that humans come toge in economic activity, Marx argued, is to create use values, to satisfy needs and wants. The process of production, however, is the expenditure of past and present human labor, measured as exchange value. The exchange value of knowledge, then, is the "socially necessary labor" that goes into the research, the analysis, and the expression required to develop it.

Marx defines "socially necessary labor" as "that required to produce an article under the normal conditions of production, and with the average degree of skill and intensity prevalent at the time." The concept of "socially necessary labor" that defines the exchange value of a commodity recognizes an "average" technology stage or platform upon which production takes place. The "socially necessary labor" then, implies also a certain common level of knowledge about production processes. The uses of computerized typesetting in newspaper production, of robotics in automobile manufacture, or of crop rotation in agriculture are examples of a technology platform. Some producers may be ahead of the average, because of some special knowledge or technique, and some may be behind the average, because they are unaware of a technique, or have not invested in state-of-the-art technology. A commodity made by a worker employed by the "behind the average with outdated technology or using outdated techniques does not have more value because the worker took longer to make it. Nor does the commodity have less value if an especially productive worker, using state-of-the-art equipment with the latest techniques takes less time to make it.

In the latter example, a capitalist enterprise can realize extra profit from use of some particular knowledge as long as the knowledge enables its workers to produce commodities whose value is less

than the "average" value of that commodity from all producers, both slow and fast, both backward and advanced. The advanced producer's commodities contain less labor than the socially necessary labor-- the enterprise ahead of the innovation wave is producing commodities more cheaply than its competitors, but selling them at the same price on the market. Thus, certain kinds of knowledge become sought-after resources; and competition drives forward technological development, although in a haphazard and socially haphazard way, because maximum profitability is the overriding goal.

Once knowledge becomes the new social average (that is, it becomes widely disseminated so now everyone is using the new technique), its ability to enable the innovator to accumulate extra profit is lost. To maximize profit from knowledge, then, the capitalist must enjoy the exclusive use of it.

In order to preserve the value of knowledge for the originator, knowledge used in production must be contained, and prevented from becoming the social average. The innovator tries to keep new techniques that give the firm an advantage hidden from competitors. At the same time, however, competing capitalists want to get hold of the newest technology to effectively compete. The patent and copyright system was developed, and continues to develop through laws and the courts, to attempt to resolve these two contradictory demands by competing capitalists--protection of profit (protecting the producer of the knowledge or technology) vs. access to profits (access by competitors who want the knowledge or technology). Copyrights and patents are the legal mechanisms for maintaining exclusive rights to a particular technique. They are treated as assets on company balance sheets, and represent sources of revenue, like mineral deposits or trade routes or right-of-ways.

The economics of "knowledge production" is such that the initial version requires a substantial investment (a high fixed cost), but subsequent copies have a relatively low reproduction cost. Thus, the exclusive, original copy of the knowledge has high exchange value. But just as machinery loses value as cheaper versions come into use, copies of knowledge, because of the relatively low cost of duplicating knowledge (hence cheaper versions of the original), quickly depreciate the exchange value of the original knowledge. For subsequent users, the knowledge, once it becomes the social average (i.e., widely known or distributed) continues to add to the mass of use values, but transfers little or no exchange value to commodities in the course of production. Each copy (book, computer disk, tape, etc.) of "knowledge" consumes almost no material relative to its development cost, so has little exchange value to transfer to the final product. Compare this with, say; a machine cut "copy" of the cutting tool consumes additional steel, energy, labor, and so forth, so it may have a substantial exchange value to transfer to the final product.

A century and a half ago, Marx noted that "all means of production supplied by Nature without human assistance such as land, water, metals in situ, and timber in virgin forests" fall into a category of things which transfer use value, without transferring exchange value. Elsewhere, Marx referred to the "gratuitous" work of machines, as the result of the machinery mobilizing natural forces. He also recognized that "the productive forces resulting from cooperation and division of labor cost capital nothing. They are natural forces of social production. So also physical forces, like steam, water, etc. when appropriated to productive processes cost nothing." "Cooperation" and "division of labor" -- learned ideas of how to organize production -- are examples of knowledge. Once discovered, knowledge costs nothing (i.e., transfers little or no exchange value), but enhances productivity, and thus adds to the mass of use values. This is the character contemporary productive forces. So when Toffler says "knowledge adds value," he is correct in the sense that it adds to the mass of use values. But in another sense he is wrong, because knowledge reduces the exchange value of commodities.

Adding machinery to production increases the constant portion of capital. It is development based on expansion of requirements - more raw materials, more fixed capital. Knowledge, on the other hand,

reduces the constant portion of capital and production requirements, while at the same time expanding output. The cost of computing power, for example, has plummeted because of new materials and new designs. Miniaturization, computerized controls, conservation techniques and new composite "smart" materials reduce raw material and energy requirements in manufacturing and agriculture. Computerized inventory control and digital telecommunications reduce inventory requirements and speed the turnover of capital. Some economists assign a majority, and in some countries, more than 75%, of the postwar economic growth in the West to improved productivity via technology, as opposed to growth resulting from increased inputs like more labor, raw materials and machinery. Knowledge, as a special for information, now dominates production itself, and overwhelms the contributions from traditional inputs to the final product.

Is Newt Gingrich a Closet New Leftist?

By Jerry Harris and Carl Davidson
Chicago Third Wave Study Group

Newt Gingrich is leading the most successful attack on the capitalist state since the 1960s. Tearing apart bureaucracies, desanctifying authority, de-legitimizing the corporate liberal political system, decentralizing power closer down to the grass roots—these are all the battle slogans of the first 100 days of power for the new Speaker of the House and his new Republican majority.

Are we missing something here? Is Gingrich a hidden 1960s new leftist in 1990s conservative clothing? Not only is he using some of our old slogans, he also appears to be invading our political space. After all, it was only after the antiwar and civil rights movements of 30 years ago that it became possible to badmouth the White House and the federal government the way it's being done today.

Some might object that Gingrich and the new left would have parted company on the question of capitalism. That's true for some. But for most of the antiwar left, it was "Hey, Hey, LBJ, How Many Kids Did You Kill Today," and not "Hey, Hey Corporate Capitalism . . . " Moreover, the Vietnam war spread the mistrust of government far beyond the left. Follow that with Watergate, CIA intrigues in Central America, the S&L Bailout . . . and you get the picture.

The left has been anti-government in its sympathies at least since Karl Marx, who saw the state as rooted in the defense of private property and an oppressive tool of the capitalists generally. Getting rid of the state was part of the final aim of communism. Lenin's writings on the topic also call for totally deconstructing the capitalist state and starting afresh with a workers' state, which was also viewed as a necessary evil during the transition to a classless society. The anti-Stalinist left also developed a theory of statism, which blamed the failure of socialism in part on the control and manipulation of the government bureaucracy by a new statist political class.

Now Newt has joined our ranks--except he's blaming the stagnation and failures of capitalism on the rise of a statist political class in Washington, D.C. The media is awash with Gingrich's polemics. No wonder it's tough being a Marxist radical in America: Newt gets more TV time in a week than we get in 30 years!

There's a serous point here. We need to avoid knee-jerk reactions to the new victories of the right. We especially need to avoid those reactions that would have us oppose the right by simply defending liberals and the government. Politics starts by taking the current consciousness of the people seriously. The American people today know something is terribly wrong with government and the corporate liberalism guiding a good deal of it. Politics as usual is causing them nothing but grief; it deepens their anger and alienation and sets the conditions for radical change. The danger, of course, is that radical change can take reactionary directions as well as progressive directions.

Assessments of class-consciousness stemming from this frustration are in vogue among many journalists and pundits these days. A recent piece in the New York Times by Louis Uchitelle offered a better one than most. As he sees it, both working-class and middle-class people share an awareness of insecurity and anxiety. But he adds that they lack "two crucial elements of class consciousness as the term has historically been used: a class vocabulary and a class enemy."

Misplaced Anger

Anger of this sort is not directed at business, but at government, immigrants and people of color, and the poor. When people lose their jobs or see their income shrink, they don't march on the banks or seize a GM plant; instead they vote out their incumbent representatives in Congress. Their anger, stoked by the likes of Rush Limbaugh, directly fueled the GOP victory at the polls.

The problem is that the Republicans have had nothing to resolve the people's anger, either. Here's where Newt steps up and offers a new way of looking at the world. He's not a traditional conservative, he says, but a futurist conservative. Some might say that's a contradiction in terms. But we know exactly where Newt is coming from: he's an independent thinker who's been influenced by Alvin and Heidi Toffler, the prime futurists of our day. He's personally acquainted with the Tofflers, authors of The Third Wave, Powershift and many other seminal works on the social impact of the information revolution. He's not alone; a good number of political thinkers, leaders and activists from across the entire political spectrum have based their perspectives on the work of the Tofflers and others on the overwhelming importance of the current revolution in society's productive forces. The Toffler's description of that event as the transition from a second-wave industrial society to a third wave information one is best analyses out there. A rereading of The Third Wave, written 15 years ago, reveals a remarkably astute book full of fresh insights that sounds like it was written yesterday.

Newt and his core followers are campaigning hard to stake out the right wing perspective within an emerging third wave society. They understand that a Republican party that gets stuck merely defending a stagnant and declining second wave business elite has no future. There are liberal Democrats with similar views--Vice President Al Gore, Labor Secretary Robert Reich, Former California Governor Jerry Brown, to name a few. From the libertarian right, George Gilder has become a noted devotee and theoretician of cyberspace. As for the third wave's left wing, we like to include ourselves and the other editors of Cy.Rev, along with many other groups such as the IGC Networks, the Electronic Frontier Foundation and Computer Professionals for Social Responsibility.

Gingrich doesn't always speak as a Third Waver. But where and when he does, the left would do well to seriously reexamine its approach to many issues. Take the issue of downsizing government. It's an inevitable and progressive outcome of the third wave: networked computers as opposed to mainframes have an inherent tendency to flatten organizational hierarchies and eliminate much of middle management. Rather than resisting downsizing, we should support it but in a way that affirms egalitarian values, popular democracy and the interests of the unemployed.

But there's a lot of hypocrisy in the right wing's approach to government cutbacks. The biggest second wave bureaucracy around, for instance, is the Department of Defense, the CIA and their far-flung military and counterinsurgency budgets. These two have wasted more treasure, destroyed more lives, stagnated more industries, inflated more currency and deepened more deficits by far than any other component of government. For example, about 50% of the federal budget is spent on military security, while about 1% goes to welfare mothers to feed and house their children.

Socialism for the Rich

Yet Newt makes cutting off welfare his top priority at the same time as he calls for wasting more money on Star Wars. This is the sham anti-government stance of the right wing, whether they're of the third wave or second wave variety. When the chips are down, they want the free market for the workers, the poor and their competitors; for themselves and their little clusters of special interests, they want protectionism, bailouts and subsidized privileges. On of Labor Secretary Reich's better

moments was his recent attack on the "corporate welfare" of the rich that was being ignored in the current climate of polemics against the poor.

Of course welfare reform is needed. But let's remember that welfare "as we know it" is the product of corporate liberalism's efforts to dampen class struggle and buy social stability; it's never been a prototype of socialism or a even a decent method for redistributing income. We also need to address the issues of crime and gangs, which Newt and the right have been using to gain a foothold among the working class with hardly any challenge from the left. For example, we need to show that the GOP plan for prison expansion only deepens the problem of crime. It would sweep millions of young men from the streets, brutalize them for several years, deny them schooling and job training except for the advanced crime skills they would learn from more hardened criminals, and finally dump them back on the street with no support but the "free market." The GOP expects this program to stop crime, rather than create more crime. If it wasn't such a tragedy, it would be a joke.

Expanding prisons as a key program doesn't do much for Gingrich's reputation as either a third waver or a libertarian. So when an issue gets hot, he retreats into decentralism--"let's leave it up to the states" --to avoid controversy. There is nothing wrong with returning many government programs to the state or municipal level. Local politics is more accessible to grass roots' movements. A good amount of decentralization, moreover, is an inevitable consequence of telecommunications and its impact on the economic base of society. Gridlock in Washington is partly a result of federal bureaucracies being too distant and too clumsy to handle regional and urban realities.

With Gingrich in charge, the next few years of GOP politics will be anything but dull. In addition to the tension between second and third wave thinking, the party is already divided three ways between the traditional pragmatic business owners, the quasi-fascist theocrats of the Christian right, and the libertarian entrepreneurs. Each of them believes, with some justification that a piece of Newt's personality belongs to them. What happens as the issues sharpen and the upheavals arrive will present immense challenges for all of us.

Labor Goes Online to Organize, Communicate, and Strike. Workers On The Net, Unite!

By Montieth M. Illingworth
Information Week

Organized labor is going online. Don't believe it? Just ask Marc Belanger, who runs SoliNet, the only nationwide computer network owned and operated by a labor union.

SoliNet (Solidarity Computer Conferencing Network) is the computer conferencing network of the Canadian Union of Public Employees (CUPE), Canada's largest union. The network has 1,500 users drawn from the ranks of CUPE and 20 other unions. But Belanger, CUPE's technology coordinator, dreams of someday giving a password to every union member in the country, or 14 million people. "To benefit from the information highway, we have to build some of it," says Belanger from his office in Ottawa. "Otherwise, we'll be left behind."

Belanger suddenly has lots of company. In both the U.S. and Canada, several unions are reaching similar conclusions about the Networked Age. In the past, many unions viewed information technology (IT) mainly as a threat to their members' jobs. While that mind-set persists, unions also see power in computer networks, and they're determined to gain their share. Some labor leaders also believe technologies could stop, or at least slow, the loss of union membership.

Labor's embrace of IT is taking several forms. The AFL-CIO operates a private online conference on the CompuServe network that lets its members communicate electronically. The Communications Workers of America (CWA) uses a computer network to plan a possible strike. And the United Food and Commercial Workers Union is raising tough questions about the rights of workers who use company computers at home.

Also, as labor moves online, white-collar workers join it. Historically, unions have represented electricians, factory hands, and other blue-collar workers, while white-collar employees were typically considered management.

Times have changed. Today, some white-collar employees at troubled computer makers, IBM and Digital Equipment Corp., use labor-sponsored networks to share information. "When hard times hit, it all comes down to information--who has it, and when you get it," says Rand Wilson, a labor organizer working with Digital employees.

Belanger started building SoliNet in 1986, originally for the 450,000 teachers and hospital, municipal, and university workers who make up CUPE's membership. He is unique in that he, not a telephone or telecommunications company, created the first national computer communications network in Canada.

Belanger believed a lot was riding on who would be first. "If we didn't do it," he says, "management would have, and that could put labor at a disadvantage. It's important for labor to have the power of technology."

SoliNet took time to build, mostly because Belanger had to raise enough money to buy a central Digital VAX minicomputer, but also because networking hundreds of union locals all over Canada is a complex job. SoliNet has proved its value, Belanger says, many times over.

In 1989, for instance, when a caretaker local at the Hope, British Columbia, school system went on strike, SoliNet helped win the day. CUPE officials, learning that the Hell's Angels motorcycle gang was coming to Hope for a meeting, invited the notorious bikers to picket with the caretakers. When the gang accepted the invitation, the news went out over SoliNet. The word spread fast and soon leaked to the other side in the strike talks. The result? "They settled," says Belanger.

Sense Of Solidarity

SoliNet also creates a sense of community among CUPE locals by providing them with news, information, and support. The net--which now connects with the Internet-- has more than 100 online conferences covering topics of interest to its member unions. Special month-long conferences deal with hot-button issues such as free trade and work-force diversity. Local union officers also download stories from the newsline and incorporate them into newsletters. SoliNet will even be used as an online classroom, linking teachers and students in a labor-degree program offered by the University of Athabaska in Alberta.

Belanger hopes SoliNet will link unionized employees of Pizza Pizza Ltd., a Canadian fast-food delivery company that last year was embroiled in a strike after it wanted to replace union members with non-union workers. The union members won the right to keep their jobs--except that they had to work at home (see story, p. 34). "If you take people out of a social work setting, then you should have a cyberspace setting so they can interact," says Belanger. But more than that, he adds, it's about empowerment, or what he calls "Learning." That is, learning more enables workers to earn more.

Budding Network

Online bulletin boards, popularized by computer hobbyists in the '80s and now the playthings of the Internet, are also proving to be useful tools for organized labor. While a handful of U.S. union locals have quietly operated bulletin board services for at least eight years, now one of the most powerful union federations in the country--the AFL-CIO, with 14 million members--has a budding national computer conferencing network on CompuServe called LaborNet.

The number of LaborNet users is small--only 360 people-- and the AFL-CIO has decided for now to limit use to union leaders. But that may soon change. In late July, the CWA, a 700,000-member union that's affiliated with the AFL-CIO, held a private conference for 60 locals in the South involved in a contract dispute with communications and manufacturing giant GTE Corp. That's also a test-run for much bigger plans. The CWA intends to link up 500 other locals next year, either on LaborNet or on an independent network--when negotiations begin with AT&T and the seven regional Bell companies. "We want to share information with the rank and file," says Marcia Devaney, a public relations coordinator with the CWA. "That's the point."

There are other labor nets, too. The Institute for Global Communications (IGC), a nonprofit organization based in San Francisco, has since May 1992 operated a network that's also called LaborNet (the name isn't copyrighted). It has about 300 users representing 150 unions, including the Service Employees Industrial Union and the United Farm Workers, plus labor lawyers, educators, and labor activists. This LaborNet comprises 32 online conferences, such as the one conducted by the 2,000-member National Employment Lawyers' Association to discuss labor law and litigation.

LaborNet also has current and archived labor news from around the world and full Internet access, which includes a link-up with SoliNet. Users pay $15 to sign up, a $10 monthly fee (it includes an hour of online time), and up to $7 for each additional hour of online connection.

The Colorado Cougar, based in Thornton, Colo., is a network of labor-oriented computer bulletin boards geared for rank-and-file workers. Like the IGC's LaborNet, it is part of the Internet and has ties with similar networks that are cropping up around the world. These include Glasnet in Russia, WorkNet in South Africa, Geonet in Germany, and Poptel in the United Kingdom.

Some U.S. labor organizers believe computer conferencing networks may help rejuvenate their cause. The unions have been losing members steadily since 1970, when membership peaked at more than 19 million people, or more than a quarter of the work force, according to the Bureau of Labor Statistics.

Today, union members account for less than 16% of the work force (though membership in Canada is close to 40%). "Uniting has never been more feasible or more necessary," says organizer Wilson.

Wilson got his first taste of the power of networking during the CWA's 1989 strike against Nynex Corp. He helped the union organize the strike and to use AT&T's EasyLink electronic-mail system to distribute strike news and negotiation updates to 60,000 members in 30 locals in New York and New England.

"Information is everything during a strike," says Wilson. "The greatest value of E-mail was damage control. Rumors about the negotiations could be laid to rest almost instantly." The strike ended with the CWA victorious in most of its demands.

Since then, Wilson has become director of Massachusetts Jobs With Justice, a community/labor coalition for workers' rights. Soon after he found out about the IGC's LaborNet, he joined.

Democratic Medium

Just as E-mail networks have enabled workers in the private sector to communicate more freely, so have these services enhanced communications among union members.

"It's an inherently democratic medium," says Michael Stein, a LaborNet coordinator. "We want union leadership to join, but we also encourage workers to sign up individually and exchange ideas with other workers in different industries. That kind of cross-sector link isn't supported by union leadership." Adds Wilson: "I can see the networks eliminating a lot of middle-layer functions among the union bosses, and that must be freaking them out."

The AFL-CIO, for one, has decided not to let technology get too far ahead of leadership. In 1992, it established LaborNet on CompuServe Information Services. Today, users pay CompuServe's $8.95 monthly fee plus an extra $5 per month for unlimited access to LaborNet. While the AFL-CIO is a federation of 86 national unions representing autoworkers, actors, miners, truckers, steelworkers, communications employees, and others, only a handful of those unions have signed on.

More significantly, the AFL-CIO service is targeted at stewards and above from the 600 city central and 51 state labor federations, says Blair Calton, LaborNet's coordinator. It's primarily a means for union bosses to talk to other bosses.

That has limited LaborNet's value to the rank and file, argues SoliNet's Belanger, who has written to AFL-CIO leaders to encourage them to develop the network further-- and to do it independently. "There is power in knowing how the networks work," he says. Organizer Wilson agrees, but says he knows why the AFL-CIO took its approach. "They want to control the information just like everybody else," he says.

Online services are encouraging some white-collar workers to organize, too. After Digital announced in July that it would eliminate 20,000 jobs worldwide, company employees in the U.S. and Germany contacted organizer Wilson via IGC's LaborNet. They sought his advice on how they could get together to discuss their options. As a result, a Digital workers' meeting is being planned.

White-collared IBMers may be joining them. Big Blue plans to lay off more than 70,000 employees this year, and Lee Conrad, head of IBM Workers United, an employee association, is also experiencing the "solidarity effect" of the labor networks.

Conrad, an assembler/tester in IBM's Endicott, N.Y., plant, started the group in the mid-1970s. Though all he has to show for his efforts today is a 150-subscriber newsletter called The Resistor, both the reach of that newsletter and the power of his group are poised to expand.

Conrad says many IBM employees are already commiserating on Prodigy, an online service jointly run by Sears, Roebuck & Co. and--ironically--IBM. Conrad is also on the Delphi commercial online service. From there he exchanges E-mail with a handful of IBM managers around the U.S., plus labor activists on IGC's LaborNet (including some Europe-based Digital workers). Conrad intends to join LaborNet, and he hopes to put The Resistor online as an electronic magazine. "A year ago, IBM management would announce plant closings and layoffs nationally. They stopped doing that. Now we don't find out about it until it's too late," Conrad says. "Online, we can get that information ourselves directly from the people affected."

But will white-collar workers actually want to organize around specific issues with their blue-collar brethren? Online chat and story swapping is one thing, but taking action is quite another. All that can be measured now is a temperament. There are signs that a growing number of people--both blue- and white- collar--are open to the possibility of joint action. "What's needed are pioneer efforts by volunteers," says one Digital worker in an E-mail posting on the LaborNet. "I'd be proud to work with them."

...And Now for the Electronic Sweatshop

What happens when home workers and management can't agree on technology?

There are days when Carol Van Helvoort feels as though she's working in an electronic sweatshop. Unfortunately, that sweatshop is her apartment.

Van Helvoort works at home on a computer terminal processing orders for pizza delivery franchise Pizza Pizza Ltd. of Toronto, and she finds it isolating. "I end up not going out at all most days," she says.

But Van Helvoort is not a typical home worker. In fact, she's a member of the only electronic home-worker union in North America, Local 175-633 of the United Food and Commercial Workers (UFCW). Along with other union members, Van Helvoort argues that she should be able to use her terminal to communicate with co-workers. But Pizza Pizza doesn't want the terminals used for any purpose other than processing orders.

Can a company dictate what an employee working at home does with its equipment during personal time? Don't look to the labor laws for much help, either in Canada or the U.S. "A 'yes' is not a given," says John Hornbeck, assistant general counsel of the National Labor Relations Board in Washington.

Van Helvoort's predicament, ironically, arises from a strike launched by her union in late 1992, after the UFCW learned that Pizza Pizza had replaced most of its 150 unionized order takers with non-union, self-employed home workers, saving itself about C$4 an hour per employee. "It was a joke," says Gord Slater, an order- taker since 1990. "Every day when we came to work, there were fewer of us."

In August 1992, the company informed the remaining workers that the room they worked in would be closed, supposedly because there wasn't enough work for them. The union found out about the use of the independent home workers and went on strike.

The dispute was resolved a year later. Van Helvoort and 25 others agreed to work from home as unionized employees for the much lower wage of C$7 an hour, or 1% of gross sales plus 10 cents per call, which-ever is higher in a given week. Pizza Pizza retained the right to use independents and now employs 75 non-union home order takers.

Van Helvoort feels she won the war but lost the peace. Aside from her unhappiness about working at home, she thinks her situation undermines the union. "If someone needs me immediately to discuss a problem, I can't be reached," she says. "I want other home workers to know there's somebody to help."

Whether permission to communicate with other employees will be granted is an open question. Though Van Helvoort believes that a loophole in her contract permits it, she still wants to work out an agreement with Pizza Pizza. The UFCW is trying to arrange a meeting with management. "We will encourage the company to allow workers to use the terminals to access a bulletin board or network," says Bill Richardson, the UFCW representative in charge of dealing with Pizza Pizza.

How far will the union go to defend what it sees as a right to communicate? Will the outcome create a precedent for the private use of corporate equipment in the home?

These two articles were the cover story in the Aug. 22, 1995 issue of Information Week. Info:

Email: labornet-info@labornet.apc.org
labornet@labornet.apc.org
Gopher: gopher.igc.apc.org
WWW: http://www.igc.apc.org/igc/ln.html"

A Model Document Access for Youth:
The Dallas Computer Literacy Project

Following is the text of an important project in Texas involving an alliance of information workers, Third Wave firms and the young people and churches of the inner city. It offers many lessons for other areas.

Our mission is to provide educational opportunities for Dallas's urban residents through the use of computer technology.

Program Description

The Dallas Computer Literacy Program, Inc. (DCLP) is a nonprofit corporation sponsored by the North Texas PC Users' Group (NTPCUG) and the Apple Corps of Dallas. These are two of the largest computer user groups in North Texas with a combined membership of over 3000. The DCLP is staffed by volunteers who are concerned citizens in the Dallas/Ft. Worth area interested in the educational needs of urban residents. Our ties to the Apple Corps of Dallas and the NTPCUG provide the DCLP with a strong base of technical support. In addition, we actively seek out partnerships with community-based nonprofit and religious groups that desire to provide educational opportunities through the use of modern computer technology for people within their immediate community.

The DCLP also works with public and private schools to teach FREE computer classes at participating schools after the school day ends. With assistance from our technical and training volunteers, the DCLP is able to facilitate the transfer of computer knowledge and skills for the educational benefit of economically disadvantaged urban residents.

The DCLP is an integral part of the solution to address the vast educational needs of Dallas's disadvantaged urban residents. The DCLP provides the opportunity to develop computer job skills and knowledge in a positive, constructive environment. This offers a real alternative to the crime and drug culture that permeates some of Dallas's urban communities and also provides a real opportunity for those working to improve their lives.

This is especially true for young people growing up in disadvantaged urban neighborhoods. Society repeatedly sends a message to our young people for them to "Just Say No" to the crime, drug and gang culture without giving them options to say YES! The DCLP provides such an option by establishing partnerships with local community based organizations in training adults and youth in basic computer skills; skills which build self-esteem, enhance employment opportunities and contribute to a sense of hope for the future. The DCLP participates with our partners in providing the following educational opportunities:

Community Computing Centers

The DCLP works in partnership with other nonprofit and community-based organizations to establish Community Computing Centers where disadvantaged people can go to take free computer literacy and job skills classes. This allows people in disadvantaged communities the opportunity to learn some of the skills required for employment in a modern information and service economy. A Community Computing Center becomes a focal point for integrating technology into a disadvantaged neighborhood and becomes the starting point for people in a community to increase their technical knowledge and employability.

The Community Computing Center also becomes a resource center for people living in a disadvantaged community. With volunteers assisting in teaching, administration and upkeep of the Center opportunities for relationships to be built between unemployed and employed people living in the same community are enhanced. This fosters role modeling by successful people living in a community and also provides an opportunity for the unemployed person to network with others for information on job opportunities or to receive suggestions from others about their job search.

A Community Computing Center is a neighborhood version of a community college's computer lab. It offers free education and training and is conveniently accessed by people living in a disadvantaged community who may not be comfortable in a more traditional academic environment. Here they can start the educational process they need to find employment or to upgrade their job skills. Finding success at this community level helps build self-esteem and confidence, two requirements for any successful person. Additionally, with modern telecommunications and computer-assisted education, people are no longer completely dependent on a human teacher. A Community Computing Center offers the opportunity to develop distance learning programs and modem based educational programs with the Dallas Community College District or even the Dallas Independent School District.

Neighborhood Computer Labs

The DCLP helps churches, schools, YMCA's, community centers and other community-based organizations establish Neighborhood Computer Labs at their sites. The DCLP does this by placing donated computers at these locations and providing volunteer technical support to help establish and maintain these computer labs. These labs become points for disadvantaged people in a community to access modern computer technology. Use of the computer labs vary from organization to organization; however, the key point is that these labs support the local church's, YMCA's or community center's educational outreach program to their community. Additionally "open lab" hours are provided during the week for anyone with a DCLP ID card that would like to use the computers. This provides people who have taken a DCLP computer class, but who do not live near a community-computing center, the opportunity to practice with a computer at no cost. By supporting a local church's or nonprofit's educational outreach t their initiative is leveraged with the knowledge of DCLP technical volunteers. Additionally as this technology rapidly develops throughout this decade a local church or nonprofit's educational program can be easily upgraded as more modern computers continue to be donated to the DCLP. The DCLP acts a technical "Salvation Army" relieving a church or nonprofit organization from having to actively and continually solicit donated computer equipment. Additionally the DCLP acts as a technical resource for local churches and nonprofits. By establishing a large network of affiliated neighborhood computer labs training efforts can be coordinated, information on educational software can be easily disseminated and innovative educational approaches can be explored with established educational institutions such as the Dallas Independent School District and the Dallas County Community College District.

Free Computer Classes

In conjunction with our community partners, the DCLP assists in offering free computer classes at established Community Computing Centers and some Neighborhood Computer Labs. Unfortunately demand for volunteer teachers far exceeds the supply; however, the DCLP refers volunteer instructors to affiliated organizations as they become available.

Volunteer instructors with the DCLP are currently teaching free computer classes at three locations: the Dallas County Community Action's Computer Training Center, Daniel "Chappie" James Learning

Center and at Colonial Learning Center. Colonial and Daniel "Chappie" James Learning Centers are two DISD grade schools with modern computer labs. They have allowed DCLP instructors to teach FREE computer classes at their schools after the school day ends 3 days a week to teachers and local residents. The DCLP has been working with the Dallas County Community Action Committee for one year now collaborating to bring free computer literacy training to residents of South Dallas. Almost 1000 people have received training through this joint program.

North Texas Free-Net

The North Texas Free-Net (NTFN) is establishing a large, public digital library with a variety of community, educational, health and cultural information available to all citizens. The DCLP makes this information available through its network of Community Computing Centers and Neighborhood Computer Labs to those citizens unable to afford a computer or the training to use one. The DCLP and NTFN collaborate closely on their many complementary activities. These two organizations are helping to build the public computing infrastructure for North Texas.

Community Partners

Conceptually speaking, the DCLP can best be described as a nonprofit "enhancer". The mission of DCLP is maximized when we partner with other nonprofits and churches to provide enhanced educational opportunities through technology. Local supporters of our mission include the North Texas Free-Net, North Texas PC Users Group, Apple Corp. of Dallas, Daniel "Chappie" James Learning Center, Colonial Learning Center, Cornerstone Baptist Church, Dallas County Community Action Committee, St. Philip's Episcopal School, Trinity River Mission, Episcopal Diocese of Dallas, Park South YMCA, Holmes Street Adolescent Center, Maple Avenue Development Corporation, Oaklawn United Methodist Church, Oak Cliff United Methodist Church, the Wesley Rankin Center, the Trinity River Mission, the Denton Literacy Program and others.

Significant Accomplishments

- Since its inception in September of 1992, the DCLP and its community partners have produced the following accomplishments:

- Almost 1000 students have taken FREE computer classes at DCLP affiliated sites.

- The DCLP has helped establish over 20 neighborhood computer labs in Dallas and its surrounding communities. These affiliated neighborhood computer labs are providing over 1000 hours of free computer lab time per month to both youth and adults living in disadvantaged neighborhoods.

- The DCLP is currently working with over 30 community-based organizations and churches to provide computer training and access for disadvantaged people.

- DCLP volunteers are teaching FREE computer literacy classes three days a week at two DISD learning centers in the Fair Park area of South Dallas and at the DCCAC Computer Training Center.

- The DCLP is working with individuals in Arlington, Ft. Worth and Denton to develop computer literacy programs there.

- Recipient of the 1993 REACH Award - a $15,000 award given by the computer industry Recognizing Exceptional Achievement in Community Help. The DCLP was recognized for its outstanding contribution to the Dallas community through education and training. The REACH award sponsors included Apple Computer, Microsoft Corporation, Panasonic Communications and Ziff-Davis Publishing.

FUTURE GOALS

Our next goals are to expand the number of neighborhood computer labs to thirty, to establish a computer repair facility, to establish a second community computing center at the Maple Avenue Community Center, in conjunction with our community partners to teach an additional 1000 people basic computer literacy classes and to continue building our partnerships with community-based organizations and churches in Dallas, Ft. Worth, Denton, Arlington and their surrounding communities.

Study Claims Poor Children Benefit a Lot From Learning to Use Telecommunications

By NewsBytes@clarinet.com

NEW YORK -- In studies funded in part by NYNEX and Merrill Lynch, researchers at the City University of New York have shown that at-risk students can benefit a lot from access to modem-equipped PCs.

The study was a three-year project by The CUNY Graduate School's Stanton-Heiskell Center for Public Policy in Telecommunications.

"The story of Project Tell is not about computers," insisted Helen Birenbaum, director of the Stanton/ Heiskell Center in a press statement. "It is about finding ways of leveling the technological playing field in ways that provide the greatest social and educational benefit to students."

The project, funded by a $3.5 million grant from NYNEX, provided a group of sixth-grade students in New York City Public Schools, who had been identified as at-risk of dropping out, with access to computers and information systems both at home and at school while offering training and support throughout the process.

Students received computers and network information systems in their homes. All who successfully remained in the program were able to keep the computers. The project also provided support and training for teachers in their efforts to learn to use computers with telecommunications capacity and to integrate their use in the classroom. As a third component of the project, NYNEX's Voice Messaging service was introduced at PS 75 in Manhattan.

Birenbaum discussed the study with Newsbytes. "There have not been enough studies on kids who are academically at risk of failure. You find them in cities and the country. What we wanted to do was work with these students, who might not have graduated high school otherwise."

Birenbaum said the study used the New York Public Schools' definition of at-risk students: "reading levels between 25-50 percentile, a history of truancy, and moving a lot from one place to another. The students were selected at random from this pool. We also had a control group," she said, of at-risk students who didn't get the technology. "There isn't much known of how these students respond to electronic communities, and electronic learning.

"Many of these students were functionally illiterate, from homes that were functionally illiterate. They didn't read well or write well," she continued. "We had so much success that NYNEX extended the computers in the home funding. We place telecommunications in the homes of these students, and the student became the teacher of the others. We provided training for the student, and caretakers if they chose.

"With the students in the home, the goal was to motivate them to remain in school," and empower them. "We responded to the students, not the reverse. We initiated the program primarily through games we thought were educational, and chat. They'd talk to each other even if they didn't know each other -- they were the same age. The curriculum piece with those students was to tutor them in areas

where they were failing, and they got to keep the hardware if they remained in the program. The program wasn't curriculum-based -- it was supporting a desire to learn.

"The second part of the program, which NYNEX has just funded, allows us to have a seven-year study tutoring and mentoring students over the network. NYNEX has offered scholarship assistance into college. We're trying to get these students into college. Our program is now geared toward the curriculum, and we're bringing on teacher-tutors and mentors in the community. We think this is going to be a very interesting, innovative program."

Results Offer Hope

The results of the study should give new hope to inner-city school systems. "I don't think the school system is aware of what these students can achieve. We just need to find new ways to reach them. Most schools don't have telecommunications or teachers who know how to use it. We're not talking about computers. We're talking about networked learning communities."

In addition to the student study, there was a study of teachers. "We put the equipment into teachers' homes, trained them, and told them that when they were comfortable we'd put it in the classroom. We asked them to create curriculum that would support learning in their classrooms, in any area. That's been not quite as successful. None of the teachers wanted the computers out of their homes -- we had to buy clones for the classroom. Then we found that because most teachers had no experience with telecommunications, it takes more support from the system" to get results. "We're developing a new program based on that, using a Merrill Lynch $100,000 planning grant. It's a professional development program. We want them to learn to use the computer as a tool, something the teacher can use so they can help kids learn."

Newsbytes asked about the impact of all this on the curriculum. "We're not going to rewrite the curriculum," she said. "What we're doing is helping teachers understand the concepts we want conveyed, through the curriculum. And we support them with this software, a resource that will help the teacher take the class through the learning experience. It encourages collaborative learning, with the teacher becoming the facilitator. It's not standing up in front of the classroom and talking." Of course, "We hope we can influence change in the curriculum" as teachers learn what they can do with the technology to change learning from an industrial model to a post-industrial model. The catch-phrase here is "out with the sage on the stage, in with the guide on the side."

Newsbytes asked Birenbaum about the center. "We're a public policy center. Part of our objective is educational change. We're not in the business of running programs. We create demonstration models from which we can step back. We target policy issues and try to influence policy-makers in school systems, government and funding agencies to realize there can be new ways to look at how learning can occur in our schools. You have to do these studies or you're not taken seriously -- if it's all anecdotal it won't influence. You have to do this well, then you can influence. It isn't obvious to the policy makers, or they'd be more responsive to allowing large urban school systems to buy the technology and do the programs. We have to collaborate with the private sector because the budget isn't there for the hardware. Once we convince the systems they need this, they'll use the budgets they have to make the purchase."

On funding technology, "They don't look at it as books, paper, and pencil yet. We're saying technology should be as integral as books, paper, pencil, and blackboards. And in the public school system it's the government that makes the budget."

Newsbytes asked about the impact of all this on efforts to make education more multicultural. "In history, social studies and geographies you can see different cultures, and ways of living. You can see how people can live among each other. There are programs where you can be networked to other kids, in Costa Rica and Moscow. It's very exciting. Then the school teaches them about these other students. If these kids can get experiences and understand experiences, they'll change."

For more information:
Dana Blankenhorn (212) 994-0630
Press Contact: CUNY, Christy DeBoe Hicks (212) 642-2634
NYNEX, John Bonomo (212) 395-0500

The New Information Proletariat and its Platform

A Class Study Project
by Devry Students

The following four short articles were written by students at the DeVry Institute of Technology in Chicago as part of a classroom exercise. The class was given the assignment of breaking up into groups, forming political parties, and developing a platform that spoke to current issues and pointed to solutions. One group--Anthony Graff, Robert Gehr, Noel Galang and Robert Thomas--decided to call themselves the NIP Party for the New Information Proletariat. They addressed the issues of education, temporary work, privacy and intellectual property rights.

Cy.Rev felt the papers merited publication as a fascinating example of how young people see the political and economic implications of information technology and how their consciousness is taking shape. If the NIP advocates are at all representative of an emerging trend, the future holds exciting possibilities for us all.

The New Information Proletariat's Stand on Intellectual Property Rights
Empowering the Digital Laborer

By Noel Galang
DeVry NIP Project

Imagine yourself giving a friend one of your favorite books, so that you can share your enjoyment and satisfaction with them. Now imagine yourself incarcerated for the infringement of a copyright law because of your generosity. When books become software, this is what can happen, even if this example is exaggerated. Under existing laws, software copyright infringements are considered serious instances of piracy and theft.

Who owns intellectual property, such as the flow of logic behind a computer program? How long can someone own an idea? What if someone else comes up with the same idea independently? These questions are an unprecedented outcome of the information age. In the area of property rights, they lead to two more critical questions: First, should something as abstract as logic be patented? Second, do patents of this nature hinder the evolution of the information age or violate the rights of workers in this field?

To answer the first question, let s assume there were no copyright laws. You and all your friends would have the same software. All you would have to do is gather your money together purchase one copy of the program and some disks. Of course some of you may not have the instruction manuals, but that's nothing a Xerox can't handle. From a business or reseller's standpoint, there would be no need to obtain a 20-user license agreement or purchase 20 copies to sell; one copy of the product would suffice.

Without the regulation of ownership, then, the opportunity for business to exploit the labor of the programmer increases. Without the right to protect intellectual effort, a programmer may become disempowered and poor. In addition, the absence of copyright laws may possibly affect the quality of future programs. In order to sustain an income, the programmer could deliberately downgrade the code, since more money can be made on maintenance and upgrades. So to protect the rights and well-

being of the software laborer, as well as the quality of software, it is necessary to support the existence of copyright protection.

But can the existence of software copyrights ultimately lead down a similar path of unfairness? The patent laws were written to protect the hardworking entrepreneur; but these laws can also inhibit growth in the market and restrict the rights of consumers. First, copyrights prohibit growth by fostering an environment that suppresses standards and eliminates communication, which is crucial for evolution within this field.

For example, the company Compton s New Media was granted a patent, which allows them the control over most of the industry s popular methods of retrieving data from a multimedia database. Compton s has stated they will be expecting to receive royalties from multimedia hardware and software companies. These companies argue that the retrieval process used by Compton s is an industry standard. Compton s copyright does not allow others to grow without paying a royalty. This hoarding of information thus hinders the creation of standards, which is crucial for software development and should be accessible at no cost. The process of determining patents neglects any prior development work done by others; in fact, these prior ideas may become the next standard of development in the industry.

The NIP party moves to restructure the copyright system so that the inventor/worker is protected and ensures an environment where communication is facilitated without the fear of knowledge monopolies. First, the awarding of copyrights should be heavily scrutinized. The Patent and Trademark Commission should not only conduct the evaluation; it should also include individuals aware of developing standards in the information business, such as members of ANSI. Their job is to screen out any invalid or unfair patents. Unfair patents would be those that are not obviously new and innovative ideas, ideas that are currently widely in practice, and those ideas on their way to becoming standards. Second, the time of the patent should be shortened to prevent copyright abuse and info hoarding.

As time moves on and an intangible idea travels from mind to mind, its "belonging" to a solo entity becomes intangible itself. Once it's widely spread around, knowledge cannot be bottled back up and taken away. Ideas can also change and evolve into something completely different. Making all those who benefit from an idea pay a royalty after an undue period of time is unfair. Thus shorter patents are generally better. A patent with a one-year time constraint will put pressure on the owner to sell quickly before the patent expires and thereby circulate the idea. Finally, at the end of the copyright's term, the board should again decide if the idea is still innovative, has become standard, or is on its way to becoming common practice.

In conclusion, until we can get beyond scarcity and live in a world where money and ownership are not needed to spur growth and innovation in our society, the copyright system is needed. But it needs to be redesigned to take into account the current realities of the knowledge revolution.

The Clipper Chip and Privacy: Keeping the Fox Out the Chicken Coop

By Rob Gehr
Devry NIP Project

Companies and individuals alike are using computers and networks to conduct not only their day-to-day affairs, but also to manage their business dealings with other establishments. Considering the sensitive nature of many of these dealings, it's no wonder that security and privacy are major issues.

The recent introduction of the "clipper chip" has intensified the debate. The encoded chip provides a government-standard encryption method for the safeguarding of your confidential documents. The government would like everyone to use their encryption method, boasting its cost effectiveness and strength. The only catch is, government and law officers have the right, with authorization, to decrypt your private documents as they see fit.

But are we going to let "Big Brother" interfere where it is neither wanted nor needed? By submitting to the clipper chip, we are welcoming government eyes into our homes and offices. If the clipper chip is widely accepted, what stops the government from simply tapping or hacking into the system of everyone it suspects of some crime or conspiracy and sorting through or monitoring everything in your archives?

The public does not need to have its private matters monitored or protected by the government. The government is once again taking the right of privacy away from the individual and giving it to a government organization.

The solution is simple: let the people be responsible for encrypting their own information. It is our belief that the rights of the individual should be protected, including the right to keep confidential information private. Instead of spending its time and money on privacy infringement, the government should concentrate its efforts on other problems.

By letting the public decide on its own method of encryption, the American people benefit in two ways. First, they keep their information safe from the prying eyes of people who would do them harm. Secondly, the economy benefits. When the public goes out and buys their own encryption devices, they circulate money into the economy and create jobs. It is therefore the policy of the NIP that the rights of the individual stay with the individual unless they are restricted by the due process of the courts. There should be no action on the part of the government to encourage or force any sort of government regulation on the encryption of information.

Computer and Network Access: A Vital Step to Getting Equal Education for All

By Anthony Graff
DeVry NIP Project

The United States education system, as it currently exists, needs to be restructured so that the imbalances that are in place can be righted. Many inner city and rural education systems do not prepare their students to break the poverty cycle. School districts in wealthy areas do a much better job of preparing their students for the changing world

Although education is primarily a local issue, the New Information-age Proletariat (NIP) believes that more Federal Government resources should be committed to the nation's education system because a better educated nation is a safer, more productive, and equitable one. Better education, especially in less-advantaged areas, could lead to less crime, a better trained work force, and could prevent the social inequities that exist in this nation today by giving all Americans a fair chance at a decent life. The NIP would like to use Information Technology to address this issue.

The NIP believes that more Federal resources could be given to economically disadvantaged school districts. More tax dollars could be spent in areas that have trouble supporting a good school district, such as the inner city and rural areas. This would give everyone a chance to prosper in the changing world. Also, more resources could be devoted to programs such as Head Start, which prepare preschoolers to do better in school.

The NIP also feels that the Federal Government could introduce Information Technology into the classroom. One way to do this is to set up a national network similar to Internet, to which all schools would have access. This educational network (EDUNET) would be similar to CPSNET (Chicago Public School Network).

This network would be able to teach students new skills that would be marketable in the new work world. Students could learn how to program a computer and how to set up a computer network. Students could also learn business applications such as just-in-time inventory control, total quality management, word processing, spreadsheet setup, database applications, and the like. Students would have access to an enormous database of information. Special presentations would also be available to all schools. Students could also participate in interactive projects such as electronic "town meetings" with government officials and science projects such as deep sea exploration with unmanned submarines, or the space shuttle.

Operating a computer can be an educational tool in itself. Students must learn communication skills such as paragraph composition, grammar, and punctuation when they send electronic mail. Programming or troubleshooting a computer system also teaches students research skills because they must consult a reference manual.

The government must be careful not to impose too many regulations when setting up EDUNET. There should be no undue bureaucratic regulations, such as too much paperwork. The laws of the land should place the only restrictions on what students can and cannot do on the network. The most effective way for students to learn is if access to the network is readily available and regular.

Perhaps one of the most important attributes of electronic education aids is that they are great equalizers. For one, setting up a system would not be cost prohibitive, because older computers could

be used. The EDUNET would be in place. Volunteers could work with paid information managers to staff the system at a local and network level. Secondly, school computers would be the only ones available to students who come from economically disadvantaged homes. Thirdly, computers would allow communication between persons of different socio-economic backgrounds.

To conclude, the NIP believes that Information Technology can help improve the inequities that are currently present in the nation's education system. Proposals such as EDUNET would allow students from all different cultures and socio-economic backgrounds a chance to get ahead in the new Information Age. This, in turn, would make the country a safer, better, and more prosperous place to live for all.

Getting Better Wages, Benefits and Working Conditions for Cyberwork Upgrading the New `Temp Workers'

By Robert Thomas
DeVry NIP Project

The Information Age has driven labor into a more service-oriented economy. Within this service oriented economy there is a great deal of temporary or part-time employment. Temporary work agencies have been providing companies with temporary or part-time employees as needed. Temporary employees are a financial dream for companies. Although wages and health benefits are within the bounds of the current law, they cannot keep pace with the constantly increasing standard of living. Most temporary workers are not paid by the quantity or quality of intellectual involvement that was dedicated to the service, but simply on an hourly basis.

SOLUTION:

The NIP would promote and implement a Dynamic Temporary Services Organization to allocate temporary employees to temporary services. The Dynamic Temporary Services Organization (DTSO) would provide a network in which employees would have access to multiple sources of job opportunities, by working though various temp agencies. This organization would be responsible for rewarding the employees with payment for the service.

Temporary employees would be provided with the option of forming a union. New information jobs are being created every day, so new classifications of the new service jobs need to be developed. Then collective bargaining would be held between the temporary employees union, the DTSO, and the companies who use temporary employment on a regular basis. Those companies who do not participate in this bargaining process must adhere to any agreements made when using temporary employment in the future.

Probably the most important issue to be focused on in the agreements should be fair wages. Reward of service should be paid in relation to the new job classification and the new types of service. Because these new jobs are more knowledge based, income is needed to compensate for the time spent acquiring that knowledge, as well as the temporary job itself.

Another problem with temporary wages is the opportunity for wage advancement or raises. A new way of raising employees' salaries in a shorter time span is required. Evaluation should be based on all of the work they have participated through all the work agencies. The total amount of yearly work should be the basis for higher wage rates based on their total experience.

Right-to-Work Laws would not include temporary or part-time employment. Any temporary or part-time employment must participate in the dynamic allocation of temporary work thus granting guaranteed health benefits and fair wages to all.

The New Information Age is changing technology faster than our social and political institutions can provide the proper organization. Service-producing industries were 76% of individual employment in 1990. We need to adapt to the new service labor force being conquered by the old labor problems.

The High Tech Sector: Conditions & Opportunities

By the High Tech Committee of the National Organizing Committee

Introduction

This report began as an internal discussion document of the High Tech Committee of the National Organizing Committee. Philosophically, the NOC tries to begin with an assessment of the world as it is. So this report attempts to summarize the objective situation in key areas of the high tech arena, including employment, the National Information Infrastructure (NII), intellectual property, and the high tech police state. The objective situation reveals opportunities for our work, which are also discussed below.

The High Tech Sector of the Economy

High tech is a key sector of the economy. According to the Bureau of Labor Statistics, more workers in the U.S. are employed in electronics than in automobile production. Much of the growth in electronics employment and related industries over the past three decades has been at the expense of traditional industries, as companies replaced workers with electronics and the requisite software to control electronic-based machinery. However, the same forces affecting other industries have affected the electronics industry itself, in the past four years. This is an expected development, as electronics permeates the economy, and the industries mature.

These forces can be summed up as:

- a glut in the market, with a corresponding crisis in profitability (or, the extraordinary profits of the previous period begin to come in line with overall profitability). For example, software companies are facing the saturation of the business software market, forcing companies to cut into their fat profit margins -- "$500" software packages being dumped at "introductory" prices of $50 or $100. (That is, the price of technology, especially software, is sinking to its value).

- waves of new technology making older architectures obsolete, and jeopardizing the companies that championed them. The mainframe and mini-computer companies are the primary victims here (IBM, DEC, Amdahl, Groupe Bull, etc.), where less labor is necessary to produce state-of-the-art systems (these computers are smaller, and require fewer resources to manufacture).

- in a related move, a shift from complexity in manufacture (expensive to replicate) to complexity in software (inexpensive to replicate). "Massively parallel processing" computers, where hundreds of relatively simple processors work in tandem, are replacing the old model of larger chips and larger systems. Another example is the move to "reduced instruction set computing" or RISC, away from the trend to larger and more complex chips -- the designs tend to get simpler and faster, and the software to coordinate and run them gets more complex.

- cuts in military spending. There are several reasons for this -- the end of the Cold War has undermined the rationale for a heavily subsidized military-industrial complex (or at least for particular types of weapons systems). Forces of a technology sector without ties to the

Pentagon have emerged which have pushed for more research and spending in non-military areas (these forces, identified with John Sculley, then with Apple, and John Young, then with Hewlett- -Packard were instrumental in Clinton's election). Military spending cuts can be seen as a retraction of the social bribe (defense spending as a public works project) as international capitalist competition increases, and public sector spending must be cut -- a parallel move to cuts in welfare, health care, etc. While military production-related employment cuts continue, however, the Clinton administration has retreated from more cuts in the military budget; at the same time we are seeing military technology bolstering police forces.

Companies have responded in traditional ways:

- companies are cutting labor costs through "smarter technology" -- in the case of High Tech, this has been through such developments as object-oriented software, computer-aided software engineering (CASE), and faster and cheaper computers. (As the head of Radius, a company that makes computer equipment, told the San Francisco Examiner recently, "We turn out (custom computer chips) with four engineers and a giant computer. That used to get done with 100 engineers. That's 96 engineers you don't need any more.")

- companies are cutting labor costs by exploiting cheaper labor markets (made possible by high- -speed telecommunications). Emerging new low-wage high-skill labor markets include the former socialist countries of Eastern Europe, and India, Ireland and Mexico.

- particularly in the case of companies caught in the shift to new architectures, tighter profit margins, and shrinking government subsidies, companies are dumping workers as sales drop or as profitability fails to live up to investors' expectations.

- companies are consolidating through mergers and buyouts (Aldus+Adobe and Novell+ Word-Perfect most recently, as well as various other partnerships). Companies realize savings by cutting unproductive (sales & marketing) labor costs especially, but also tech support workers, engineers, and the relatively few production workers where overlap occurs.

The cuts have been substantial:

- Domestic employment in the U.S. electronics industry fell for the fourth consecutive year in 1992. December, 1992 electronics employment was 2,291M or 99,000 (4.1%) less than the 2.39M reported for December, 1991. "The only industry segment that experienced growth in 1992 was Prepackaged Software, with a modest 2,270 new jobs. On the other hand, Defense/ Commercial Guidance Systems lost 30,000 jobs last year. With one exception, U.S. electronics employment showed no month-to-month growth for 30 consecutive months. Since August 1989, our industry has lost 309,000 jobs. And, when the industry's healthy software segment is removed from the total, domestic electronics employment dropped by more than 380,000 in the same period.[1]

- That "healthy sector", prepackaged software, only employs about 150,000 workers -- about as many people who work in cement production.

One aspect of the shrinkage in the high tech labor force is the shift from full-time regular employment to contingent work -- temporary; contract and "consulting" work. This parallels trends in other industries (Manpower is supposedly the largest employer now), and is an integral aspect of the

new "virtual corporation", where production is organized on a temporary, ad hoc basis, with workers being pulled together by capital as needed, and dispersed when projects are complete. The shock of economic contraction is shifted from the capitalist to the worker, as the worker must absorb training expenses, health insurance, and bear the cost of periods when no work is available.

The high tech workforce, especially in the weapons industry, has historically been a conservative bloc, consistent with maintaining their livelihood through inflated military spending. With the enormous job losses in that industry (an expected 1.2 million jobs in the 1992-1996 period, according to the Federal Office of Technology Assessment), there is a real danger of those workers drifting towards a fascist solution to the economic crisis. One example of this danger are the efforts of the Coalition for Visa Reform, founded last January. "Its goal is to reform the H1 visa program (and any other visa) so that technical professionals will not lose their jobs or see their pay reduced because of the cheap foreign labor being brought to this country."[2] The legitimate issue of pay equity for non-citizen workers is instead raised in the context of a nativist solution. CFVR focuses the problem on foreign workers taking jobs, instead of challenging a system that cannot provide productive the world's engineers. As more high tech work is exported to cheaper labor markets, and mobile lower-paid workers are brought in as temporary workers, "Buy American Labor" could become a popular rallying cry among unemployed engineers.

The communications sector, which overlaps with high tech work, has also been hit hard over the past three years. At the same time the "information super highway" is touted as a jobs savior, some 44,000 jobs were cut last year among the companies who have laid claim to building the "infobahn." According to the Communications Workers of America, the phone companies in particular have been eliminating union positions through automation (particularly among phone installers and operators), and transferring capital to non- union sectors of the industry, through acquisitions of related concerns (e.g., cable companies).

The privatization of information has resulted in the decimation of the public library system and the closing of library schools. The reality of trends in public librarianship belies government and corporate assertions of concern for equitable access to information.

Layoffs and other labor cutbacks especially affect workers over 40. As technical workers get older, their salaries rise, their skills age (Sun Microsystems expects 20 percent of its engineers skills to become obsolete each year [3]), and their willingness to sacrifice family and community for work ebbs. So these workers tend to bear the brunt of "restructuring", "downsizing", etc.

The job market for recent college graduates is also drying up. CFVR concluded, "[t] here are at least 50% more people entering the software programming labor market than new jobs being created. This amounts to an over supply of 22,000 workers or about 4.3% of the overall labor force."[4] These figures have been challenged, but the Institute of Electrical and Electronics Engineers (IEEE) recently found unemployment among electronic engineers to be the highest in more than a quarter century, and some 200,000 engineers were removed from U.S. employment rolls between 1991 and 1993.[5] IEEE also describes the jobs crisis as an international phenomenon. In addition, youth considering engineering or other high tech careers face the problem of getting into college in the first place, with state colleges raising tuition and closing down programs. [6]

The Digital Convergence

As electronics permeates production, the product of production assumes a digital format, a form that can be easily stored and transported electronically. "Digital format" means the symbolic representation of information as 1s and 0s, which can be converted into electrical or light pulses, and transmitted over wires and fiber optic cable; or through air and space as electromagnetic waves. Electronics-based machinery at either end of the transport system encodes and decodes the symbolic traffic, and renders it into material use values. There are numerous enormous cost savings achieved by the digitalization of products: savings in storage space required, in transmission time and cost, and in the application of computers to completely automate the processing and routing of the digital rendering. [7] Just as railroads and trucks were needed to carry the product of production in the industrial era, digital carriers are required to haul the product of electronic production in the electro

Every stage of technical development demands both transportation and a communication system that corresponds to that level of the productive forces. The Industrial Revolution was also a transportation and communications revolution, that is, one could not have happened without the other, as capital demanded better and faster means of coordinating production and circulating commodities and capital; and the manufacture of new communication and transportation systems, especially railroads, spurred industrial production to more and more sophisticated levels. [8]

The ubiquitous debate over the so-called National Information Infrastructure" (NII), also known as the "information super highway", must be examined in this context. As modern production increasingly shifts to a digital basis, as a natural consequence of electronics spreading through production, modern production demands a commensurate means of transportation and communication. Or to put it another way, to paraphrase Marx, the old means of communication and transport handed down from the industrial period have become unbearable trammels on Modern [i.e., electronics- based] Industry.

This process is most intensely affecting the information industries -- especially communications, entertainment (music, film, television and the hybrid "multimedia"), publishing, education, scientific research, financial services, and advertising. But the shift to "information-based" or "knowledge-intensive" production affects traditional manufacturing as well. Just-in-time production requires sophisticated information networks to work. Modern robotics-based production requires not so much assembly workers as computer operators to monitor the workflow. Designs and orders enter into the machinery through digital ports: "'retooling' with the new "flexible manufacturing systems", simply means changing the software that guides the machines. The assembly line (hardware) remains unchanged. The robots, hardly pausing, begin exercising different actions in obeyance of the newly-loaded programs."[9] The production and circulation of goods is increasingly an information processing function.

The terminal phase in capitalism is being driven by the expulsion of labor from commodity production. Objectively, this manifests itself as rising global unemployment, and for those able to find a market for their labor power, falling wages. The increasing use of information technology in the context of intense global economic competition is rapidly eroding wages. In 1979, 12 percent of the full time workforce earned less than the "poverty wage", so-called because it is the amount necessary to support a family of four above the official poverty level ($13,000 in 1992 dollars). By 1992, 18 percent of the full time workforce was earning less than the poverty wage, an increase of 50 percent. Thus, of those workers able to find full time employment, one in five is not earning enough to support a family. [10]

The expulsion of labor from commodity production results in a crisis in the realization of profits. To maximize profit, the capitalist is driven to a handful of strategies: expand markets, cut costs, and speed up the circulation of capital. The digital transport and communication system, the NII, helps capital in each of these areas. At the same time, the cure only worsens the deteriorating condition of the afflicted.

Transportation and communication is key to the realization of profit by ensuring the circulation of capital. The faster and more cheaply capital circulates (that is, goods leave the contemporary point of production and reach the purchaser as quickly and with as little human intervention/labor as possible, and money returns to the producer just as quickly), the higher the rate of profit. Seeking out faster, cheaper circuits is an expression of the quest to maintain profits as the technical level of production advances.

But this means at the same time that less labor is needed in the overall process of global production and distribution. For example, it is technically possible for music to be delivered directly from the source (e.g. musicians or record company) to consumers, in CD-quality format. This eliminates the manufacturing, packaging, trucking, and retail workers involved in this particular industry. More value is driven out of the product, laying the basis for overall profit rates to fall further.

Another historic strategy for dealing with the falling rate of profit has been to expand the market (by bringing more of the world's population into the commodity exchange system, by commodifying new areas of human wants, and by putting cheapened commodities within the price reach of larger numbers of workers). Transportation and communication systems have been a fundamental component of capitalism reaching out over "the whole surface of the globe," as Marx described in the Manifesto. But with the entire planet pulled into commodity production and exchange, the contemporary transport and communications systems can only facilitate more intensive competition among various capital groupings for market share. Unable to extensify the market (geographically, there is no other known populated world to conquer) or intensify the market (consumers have exhausted their credit and savings), the capitalists can only raid each other's market.

The digitalization of production and distribution smashes the technical barriers that once separated various industries and markets (e.g., the motion picture market was distinct from newspaper publishing market was distinct from the recording industry market; and cable was distinct from telephones was distinct from video stores). This represents both an opportunity for companies (other industries' markets become available) and a profound danger: Companies with once-secure monopolies in their respective sectors are now being forced to deal with new competitors now that the walls are falling. That is, the markets of these various sectors are converging, as their products converge to a vast sea of 1s and 0s.

The digital convergence is laying the basis for a new, extremely intense round of competition among very large concentrations of capital. The merger, takeover and partnership frenzy among computer, communications and media companies that has dominated the business news over the past two years is a life-and-death struggle for these enterprises, and when the smoke clears, we will see fewer companies competing in a greatly consolidated market.

Intellectual Property

One other important process in the digital economy is the emergence of intellectual property as a key source of profit. As information and knowledge in its various forms assumes a dominant role in

production, the monopoly control of that knowledge can be a source of tremendous profits in concentrated sections of the economy. The replication cost of digitized knowledge is near zero, and monopoly control allows the seller to demand whatever price the market will bear. That is, the law of value is temporarily defeated until the knowledge reaches widespread use. Substantial profits lie in the gap between social value and the individual value of products. This social value is propped up by patents or copyright (granting a temporary monopoly to the patent or copyright holder). "Knowledge can only acquire a price when it is protected by some form of monopoly."[11] This makes possible the extraction of superprofits from that sector of the economy. "Intellectual property rights" linchpin of profit for high tech companies. This explains why companies are so quick to drag their competitors to court over various "property" infringements, alleging in some cases billions of dollars in losses (e.g., Intel vs. AMD, Apple vs. Microsoft, Lotus vs. Borland). The Software Publishers Association has pursued an aggressive campaign against unauthorized duplication of computer programs, including encouraging workers to turn in co-workers and employers via an 800 number, and pushing the FBI and other police forces to arrest violators.

These "property rights" issues have taken on an international scope. Shared "property rights" conventions are required to internationalize the market and open up new profit-making potential. So the U.S., under pressure from Genentech, the bioengineering company, refused to sign the biodiversity agreement at the 1992 environmental summit in Rio de Janeiro, because they argued that the treaty did not provide enough "protection" for U.S. gene splicers. Aspects of GATT (the General Agreement of Trade and Tariffs), the WIPA (World Intellectual Property Agreement) currently under debate at the Hague, and the Berne copyright convention are attempts to harmonize international "intellectual property" conventions. Countries may be ostracized from world trade until they change their property laws to conform to contemporary world capitalism standards.

"Intellectual property" reaches its most absurd heights in biotechnology (and explains why biotechnology is such a popular speculative arena for capital). Patents on genes in biotechnology enable monopoly control over the production of food, rather than just the distribution of food, as is the current case. This very complex process is just beginning -- that of converting economically important plants and animals into private property through the mode of modifying their genomes, and then patenting them. The application and enforcement of intellectual property rights will be accomplished in biotechnology through increased impoverishment, starvation and death of those who cannot afford patented foods and pharmaceuticals.

Technology and the Control of the Social Revolution

The economic revolution that is proceeding from the technology revolution is creating a social crisis, from which the beginnings of a social revolution is emerging, as is well-documented in the pages of the People's Tribune. The response by the ruling class "is turning from neglect to attack," with greater levels of repression.

Beyond the welfare agencies and social engineering institutions, lay the armed state agencies. Police forces have turned to more sophisticated technology to control the emerging social revolution. This technology takes many forms -- satellite surveillance of communities, INS databases of undocumented workers and proposals for a national ID card or national employment registry, automated prisons, electronic fingerprinting of welfare recipients, DNA "fingerprints", etc. Historically, new forms of control of the working class are first advanced against the most vulnerable and least organized, and afterwards spreads to the general population.

At the same time, the various police forces are moving to control the new areas of human interaction made possible by new technology. New technologies provide powerful tools for protecting privacy and sharing information. To maintain control over the new technology, information and the people who use it, the U.S. government is clamping down on several fronts.

Here are a few recent developments:

The FBI wants to require all computer bulletin boards and communications carriers and makers of electronic communications equipment to give it a way to spy on everyone who communicates.

The federal government is pushing ahead with its so-called "Clipper Proposal," a plan to subvert private communications by requiring users to give cryptography keys to the government.

The Commerce Department has recommended changes in the copyright law that will outlaw the use of technologies that can break "copy protection" schemes.

This summer, a Tennessee jury convicted a couple who ran an adult computer bulletin board in California of 11 counts of transmitting obscenity through interstate telephone lines. A U.S. district attorney used conservative Tennessee "community standards" against the couple because he was able to copy pictures from the couple's computer, 2,000 miles and several states away. With computer networks, what is legal in one state or country can still be prosecuted in another place where that same activity is illegal.

Various proposals have emerged from the Clinton administration over the summer for proposals that will facilitate tracking people: electronic delivery of gove rnment benefits via an ATM-like benefits card, a national health card, and a national "work- eligibility" card and/or employment registry.

The government claims that it needs these proposals to protect the citizenry from drug dealers, child pornographers, welfare frauders and terrorists -- these are the Trojan horses by which the police state will be introduced in this country.

Another level of control is emerging through the debate on human genetics. The proposals of biological determinism, trying to assert a genetic basis for joblessness and criminality, will be intensified, with more sophisticated and even more fraudulent pseudo-scientific models.

Opportunities: High Tech Workers

As the old system of lifelong stable employment breaks down, opportunitie s arise to influence how high tech workers comprehend what is happening to them. Without ideas being introduced into the debate that point the way towards a reorganization of society along the basis of distribution of social wealth according to need -- a communist resolution -- those workers will succumb to fascist agitation (the problem is Indian programmers, or undocumented workers, or people on welfare; the solution is more police and prisons, less welfare, gated communities and walls around the border).

High tech workers being displaced through the technological changes discussed above need a program that points the way forward. What would such a practical program be? Developing self-defense organizations (e.g., a union) for high tech workers? Pushing for a guaranteed income, to remove the economic terror faced by contingent workers? A redistribution of work, based on a shortened work week? A government jobs program? Effective training programs? Such a program overlaps with the demands rising out of other sections of the trade union and unemployed workers

movement. Events like the MIT Technology and Employment Conference last January, and the planned Chicago Technology and Employment Conference next March provide opportunities to raise these issues, and advance the development of a practical program. As workers in high tech, we need to raise these issues in the various forums that we have available.

Opportunities: Youth

The burden of dead end, low wage jobs, or no jobs at all, especially hits youth. For full time workers age 16 to 24, the increase in poverty earnings went form 23 percent in 1979 to 47 percent in 1992.[12] Growing numbers of college educated youth are finding their opportunities defined by dead end, low wage jobs. When the bleak prospects of fully employed youth is combined with the fact that, in many areas of the country, youth unemployment approaches 50 percent, the revolutionary position of youth becomes clear. For a vast section of America's youth, the capitalist system offers no future.

The phenomenon of "hackers" should be examined in this context. Expressing an explicit disdain of capitalist property laws, these youth represent in many cases the hint of a new society in formation, expressing the values of sharing, exploration, and creativity. They have succeeded in drawing a great deal of fire from the Secret Service, the FBI, and local law enforcement agencies who recognize the vulnerability of the digital infrastructure. As with other sections of society, this loose youth movement will likely polarize. Generally missing from their discussions is an overall understanding of the historical significance of their activity. Although implicitly communist in their outlook, unless this impulse is nurtured and cultivated through discussion and education, it will wither, be bought out, or pervert into a fascist impulse. Important opportunities exist for linking up the hackers movement with other currents of the youth movement -- the truce movement, the new student move "Break the Blackout" movement, the anti-censorship movement.

Opportunities: Popular Convergence and the NII

At the same time that once-distinct capitalist markets are merged, the various popular organizations that addressed individual arenas around media access, education, artists' rights, and labor issues in the various computer, communications and artistic spheres are also thrown into working together. Organizations that fought for a vital public library system or that fought for public access to local cable television systems or that represented culture workers in film, music, writing etc. have a new, practical basis for working together with each other and with new groupings like the community networking movement. This has taken a concrete expression in coalitions like the Telecommunications Policy Roundtable, probably the largest of these efforts on a national level. Organizations as diverse as the American Library Association, the Consumer Federation of America, the Communications Workers of America and Computer Professionals for Social Responsibility, along with an other 100 or so organizations they are on the some battlefield in the struggle for equitable access to work, information and audience. Coalitions like this are replicated on the local level, for example, in Chicago in the recent formation of the Chicago Coalition for Information Access.

The breadth of organizations that have stepped forward to advance a progressive position on the NII affirms the broad nature of the struggle for democracy in culture -- culture in its grandest sense -- that the battle around the NII represents. Missing from most of the debate around the NII, though, is a broader context for understanding the relationship of the technology revolution to the global economic and social crisis.

The general tendency in the current discussion is to begin from the point of view of those already able to afford access to information, the upper strata of the working class that is afraid of being shut out of the developing process. Largely ignored in the debate is the growing section of the population that has no financial means, often no educational means, and no social means (housing, food, health care, etc.) to use the NII as it is envisioned. It is important that this survival movement (the movement for shelter, welfare rights, health care, etc.) take up the call for access to culture and knowledge, and that those with the skills and access encourage and defend their participation. The general struggle around the NII will be to define "universal access" in the broadest, most democratic way possible -- access to knowledge, access to culture, access to technology, access to skills, access to audience, access to democracy, access to a future worth living in. What this means in terms needs to be worked out.

Opportunities: "Intellectual Property"

Companies attempting to claim "intellectual property" rights are in a position analogous to the landlords attempting to enclose common pasturage in the 17th and 18th centuries. The property less class generally sees no problem with copying videos, computer software, music, magazine articles, etc. for friends. As in the period of the land enclosures, capitalists must force a new understanding of "property" and "property rights" onto people, through propaganda campaigns like the SPA's "Don't Copy That Floppy"; the force of the police; and international trading sanctions.

Within the science and high tech sectors, the private, capitalist appropriation of technology for the purpose of amassing profit stands in stark contradiction with its possible benefits. Battles have emerged, and will intensify over patents and copyrights. In the international arena, the fight over patenting of plant life has important consequences for developing countries, by forcing a new kind of dependency on the U.S. This struggle will be especially sharp over the patenting and private ownership of human genes, which is particularly significant because of its impact on the larger question of private ownership of life forms.

In this battle, we have a class culture of sharing on our side, which the information capitalists must attempt to dismantle. In this battle, the capitalists present a weak flank -- the conflict between property relations and productive forces stand in stark contrast. On the other hand, the battle is certainly not won, and the information capitalists have organization, money and the state on their side. Organizations like the League for Programming Freedom and organizations of geneticists and other scientists are raising the issues, but the fight needs to be broadened and deepened.

Articulating a Vision

The Industrial Revolution represented a process in which commodity production was uncoupled from the limitations of individual human muscle power and manipulative skill. Machinery was developed which harnessed and integrated the manipulative and muscle power of individuals to much greater power sources: water power and steam engines, and later, internal combustion engines and the electric dynamo.

The current electronic revolution represents a process in which the intelligence and knowledge of the individual is appropriated and incorporated directly into the production machinery. Under capitalism it displaces the worker and the worker's skill. However, the electronics revolution also represents the collection, summation and integration of the intelligence of individuals and groups into a higher form of knowledge. This knowledge potentially then becomes available to all members of society.

To our colleagues and fellow workers, we must articulate the simple truth that capitalism stands in the way of social progress. We must be clear in communicating that whatever moral or humanitarian impulse led a scientist or engineer or technician into this particular field is being blocked and stifled by the private appropriation of social wealth.

We also need to articulate a vision of what this society could be, to provide a rallying point for the forces of change. In a reorganized society, for example, the enormous potential of biotechnology to identify the causes of disease -- rather than to provide therapeutics to alleviate symptoms, or to condemn individuals before they are even born -- could be unleashed. The sharply increased production capacity is sufficient to provide sophisticated goods to all members of society. The new information networks have the potential to make the total of human knowledge accessible to all of society. High tech workers -- scientists, engineers, researchers, technicians, etc. -- those of us who design, use and understand the potential of the new technologies must help give shape to the vision.

We welcome your comments, and invite you to join with us in carrying out the work before us.

The High Tech Committee of the National Organizing Committee may be reached by writing PO Box 477113, Chicago, IL 60647, or sending email to jdav@igc.apc.org. We welcome questions, suggestions, and critiques.

FOOTNOTES

1. CPU: Working in the Computer Industry #005. CPSR Working in the Computer Industry Working Group. Figures are from the American Electronics Association, in the 1993 Computer Industry Almanac

2. "Standard greeting and charter." Coalition for Visa Reform.

3. CPU: Working in the Computer Industry #004.

4. CPU: Working in the Computer Industry #011.

5. "Jobs at Risk" IEEE Spectrum. August 1993.

6. The biotechnology industry represents another face of the technological revolution. Its direct impact on employment and the economy is much smaller than electronics, with less than 200,000 (mostly scientific) workers nationwide. More work needs to be done on employment trends in this sector of high-tech.

7. This "digital advantage" may be the material basis for the radically different features of the so-called "information economy", rather than some essential character of "information" or "knowledge" as has been advanced elsewhere. For a deeper critique of "information exceptionalism", see Dan Schiller's "From Culture to Information and Back Again: Commoditization as a Route to Knowledge." Critical Studies in Mass Communication. March, 1994.

8. "The revolution in the modes of production of industry and agriculture made necessary a revolution in the general conditions of the social process of production, i.e., in the means of communication and transport." (Marx, Capital)

9. Davis and Stack, "Knowledge in Production", Proletariat. 1992.

10. Census Bureau, Current Population Report, 1994.

11. Tessa Morris-Suzuki, quoted in Beyond the Casino Economy. Verso, 1989.

12. Census Bureau.

9/26/94

Book Review:

Post-Capitalist Society

By Peter Drucker
Harper Business
New York City 1993
$25.00, 232pp.

Reviewed by Carl Davidson
Cy.Rev Managing Editor

Peter Drucker has long been one of the better theorists of modern business organizations. He is also a gadfly who enjoys tweaking the conservative sensibilities of his main readers, the American corporate elite, with dire forecasts and provocative propositions.

This latest work, Post-Capitalist Society, is well within this vein. On one hand, Drucker offers a number of keen insights into the impact of the information revolution on the organization of work and society. The book's sweeping summaries of the role of knowledge in a variety of historical settings is especially lucid and illuminating. On the other hand, more than a few of his assertions are overblown or oversimplified to the point of being ridiculous.

For instance, one of Drucker's more bizarre claims about politics is that "no successful business executive was ever greatly interested in power; they were interested in products, markets, revenues." What about Ross Perot? Or the Rockefeller brothers? Those are only the most obvious; there are so many counter-examples it makes you wonder what planet Drucker is talking about.

Drucker makes another bizarre claim about the new rich: Since World War 1, he argues, "no one has matched in power or visibility the likes of Morgan, Rockefeller, Carnegie or Ford in the United States." Microsoft's Bill Gates, of course, has been making the cover of the top magazines ever since his software-generated billions made him the richest man in America.

These bloopers, however, do not undermine the validity of Drucker's main point: new wealth in today's world is increasingly being generated by knowledge and information. This new method of generating wealth, moreover, is transforming every other aspect of the social order.

This thesis is by no means original with Drucker--although he unabashedly claims to be the source of a wide range of new ideas. Many others, from Daniel Bell to Alvin and Heidi Toffler, have described the information revolution's impact on modern productive forces more thoroughly and lucidly. Drucker does make a special contribution to the discussion, however, by his focus on Frederick Winslow Taylor and his theories of "scientific management" as a forefather of the information revolution.

F. E. Taylor, the author of the time-and-motion studies known as "Taylorism," has always been denounced by trade union leaders as the instigator of speedup and layoffs on the assembly lines. Taylor's methods, nonetheless, were instrumental in the vast expansion of productivity that made possible the "middle class" standard of living for many workers in the advanced economies of the Northern hemisphere.

"As late as 1910," Drucker points out, "workers in the developed countries worked...at least 3000 hours per year. Today, the Japanese work 2000 hours per year, the Americans around 1,850, the Germans at most 1600--and they all produce 50 times as much per hour as they produced 80 years ago."

Drucker explains how Taylor's studies of the work process on the factory floor went far beyond simply trying to find ways for workers to move faster. In fact, when a task was isolated as boring and repetitive, Taylor's proposal was to mechanize the process with machinery, while assigning the workers to the more complex, knowledge-intensive tasks.

But this is also where Taylor crossed swords with the craft unions of his day. At that time, craft skills were to be kept a secret within the craft, only to be handed down piecemeal from master to apprentice. Through his studies of the labor process, Taylor wanted to demystify craft skills, break them down into their component parts, and standardize them in written form. This would make it far easier for the average worker to gain the ability and accomplish the productivity of the skilled craftsman. Taylor saw this as a means of "democratizing" work by raising the level of the majority of the workers, rather than protecting the privileges of the few that were rooted in the restriction of knowledge.

Taylor was not only concerned with raising the skill level of individual workers; he was also focused on how their skills were linked together and organized. Says Drucker: "The function of organization is to make knowledges productive...Knowledges by themselves are sterile. They become productive only if welded together into a single, unified knowledge. To make this possible is the task of organization, the reason for its existence, its function.

Drucker's analysis here draws on his past contributions to management theory; he then extends it to other arenas, taking up changes in the forms of government, education, nation-states and society generally. In doing so, he makes the point that the information revolution rendered the previously existing forms of socialism obsolete; yet he also notes that the existing capitalist forms are being challenged as well.

"The same forces," Says Drucker, "which destroyed Marxism as an ideology and Communism as a social system are, however, also making capitalism obsolescent."

One of his more interesting points is made as a side comment on the socialism-vs-capitalism debate. In the last 25 years, he notes, the rise of pension funds has completely altered the nature of ownership in the U.S.:

"In the United States, these funds in 1992 owned half of the share capital of the country's large businesses and held almost as much of these companies fixed debts. The beneficiary owners of the pension funds are, of course, the country's employees. If socialism is defined, as Marx defined it, as ownership of the means of production by the employees, then the United States has become the most "socialist" country around--while still remaining the most capitalist one as well."

What this reveals is that working-class ownership of the means of production in the U.S. is not that different from the former USSR: it doesn't mean much without working-class political power. In this sense, the pension fund phenomenon reveals that a political and economic democracy enhancing participation, access and control is a more radical notion than who holds the ownership title to the productive forces.

One this last point, Drucker simply tries to have it both ways. On one hand, he argues hard for increasing productivity by vastly expanding workers' control at the workplace and disparages the idea of "productivity-by-command." On the other hand, he argues that politics should be left to politicians; unions and worker organizations especially should avoid any efforts to achieve political power. This approach to politics, of course, has always been management's perspective. But it also means disabling the motive force for democratic change, even changes that Drucker himself might want to see implemented.

In addition to editing Cy.Rev, Carl Davidson is director of:
Networking for Democracy
3411 W Diversey, Suite 1
Chicago, IL 60647
Tel: 312-384-8827
Fax: 312-384-3904
E-Mail:democracynet@worldnet.att.net

The Los Angeles Revolt: Its Lessons for the World

By Alvin and Heidi Toffler
World Monitor

Cy.Rev Appendix: While several years old, we thought this article by the Tofflers from the June 1992 issue of World Monitor helped to illuminate the application of their theories to current events. It places Newt Gingrich's popularization of a right wing approach to the Third Wave in a broader perspective.

The flames that swept America from Los Angeles to Atlanta in the Spring of 1992 hold unnoticed lessons for Europe, with its rising ethnicism, its skinheads and ultra-nationalists, and even for Japan and other currently peaceful societies. The fact that an all-white jury exonerated a gang of white police who sadistically beat up a young black man named Rodney King in California may have provided the trigger, but the explosive charge that powered the Los Angeles riot is not a local, nor even an American phenomenon. It is a global event linked to a basic redistribution of economic and political power. It has its roots not merely in racism, but in the techno social revolution now sweeping across the earth.

American cities were torched in racial rioting in the late 1960s, too. Despite the passage of a generation, the explanations offered for the latest round of arson and looting were virtually the same. From George Bush one heard conventional calls for law and order. From his opponents came a string of clichés about poverty, unemployment, racism, and urban hopelessness.

All these elements were and are unquestionably present, but they form only a small part of a much larger story. For this latest upheaval is more than a protest against police brutality or a symptom of age-old ills. It reflects (1) a dangerous new kind of racism and (2) a new, far more intractable kind of unemployment both with implications that reach beyond the United States.

The new racism and the new unemployment spring from a new system of wealth creation that is spreading swiftly through all the affluent nations, destroying the "mass society" of the industrial past.

The invention of agriculture thousands of years ago launched the First Wave of social transformation in history. The industrial revolution triggered a Second Wave. Today a Third Wave of techno social change is sweeping through all the high-tech countries, hitting the US the hardest, and California even harder.

The industrial revolution created mass societies. In them, mass distribution, mass consumption, mass education, mass political parties, mass communications, mass entertainment, and mass welfare services paralleled mass production. Homogeneity was their ruling principle.

Today's Third Wave of change shatters the industrial mass society. The new governing principle is heterogeneity. Thus today in the US, Japan, and Europe alike, mass production is increasingly being replaced by "de-massified" manufacture based on short runs of heterogeneous and even customized products made in flexible, computer-driven factories. The mass market is simultaneously breaking into "niche" markets defined and organized by computers. Consumption is being de-massified in parallel with production.

The media, too, are de-massifying. In the US, for example, almost 60% of American homes now receive video imagery from an average of almost 30 different channels instead of from only three giant TV net works. And the latest TV sets are designed to provide more than l00 channels.

Prime-time viewer ship for the once dominant networks has been slipping, their mass audience breaking into parts. Even their news gathering competence is now challenged. Thus the fact that the Rodney King beating came to world attention because a private citizen videotaped the event or that private citizens with hand-held video cameras documented the subsequent riots is perfectly symbolic of the decline of the traditional mass media as new media come on stream and diversify the imagery consumed by the public.

Radical Change in Family Structure

The standard industrial family unit of the mass society - into which almost everyone was supposed to fit - was the "nuclear" family, composed of a working father, a stay-at-home mom, and two children under the age of 18. Today only about 5% of American families fit into this Second Wave model, and perhaps even fewer in California.

Today's society gives rise to a wide variety of familial relationships, ranging from single motherhood to serial or successive marriage, and so-called "sandwich" families in which a middle-aged couple takes responsibility for both its children and its parents. In the poorest of American communities, single mothers and out-of-wed lock children are virtually the norm.

The family has not "died." Instead, the once homogeneous family system has de massified along with production, consumption, and the media as the Third Wave economy and society have developed and spread.

The deep de-massification process, which is now hitting many countries, has direct impacts on ethnic or race relations.

During the Second Wave era, the industrial economy needed a standardized, mass labor force. During the early period of industrialization, the US, unlike Europe, suffered from frequent labor shortages as workers migrated westward. The rising industrial elites solved this problem by substituting energy and innovative technology for labor. Politically, they enacted open immigration policies. Thus, polyglot workers flooded into the US from all over the world.

To increase labor efficiency, it was necessary to homogenize or massify the workers. Hence there arose the "melting pot" ideal, which told immigrants to slough off their old culture and to reemerge with new, wholly American identities. But while many different cultures and religions were assimilated, Americans, including the new ones, resisted the integration of non-Caucasian races into the society. African-Americans in particular had to fight every inch for entry into the economy and society on an equal basis with others - and, despite some notable exceptions, have not yet succeeded. For generations they formed the last reserve of the labor force, given jobs only when all other labor pools were exhausted, as was the case during World War II.

One result of all this was continuing conflict between the white majority and the black minority as each competed for employment and the income that flowed from it.

This was the background for old industrial-style racism, and it has some similarities to the situation in Germany, France, and other European nations that invited Turks, North Africans, and others to fill jobs at the bottom of the ladder during the years of economic expansion in the 1960s and 1970s.

As the Third Wave of change arrived, however, the needs of the advanced economies shifted, and so did public attitudes toward immigration, integration, and assimilation.

In the US, and especially in Los Angeles where the recent violence erupt ed, the melting pot has been replaced by the so-called "salad bowl" concept under which ethnic, religious, racial, and other groups retain their cultural identity yet, at the same time, demand dignity, justice, and equal access to economic opportunity.

This Third Wave alternative to the Second Wave melting pot is, in fact, nothing more than de-massification applied to inter-group relations as the whole society becomes more heterogeneous. In the US, it has produced a far more complex mosaic of racial and ethnic groupings. Tensions between majority and minority are now overlaid by minority vs. minority conflicts, is between Koreans and blacks in Los Angeles and New York, or between Cu bans and Haitians in Miami.

All these community conflicts are intensified by a structural change in the economy that has been virtually ignored in the entire post-riot tooth gnashing and hand wringing. A Third Wave economy simply does not have enough routine factory jobs for the Rodney Kings of the world - or, for that matter, for the racist skinheads who beat up blacks and Asians in California or Turks and North Africans in Europe.

Second Wave smokestack societies, based on rote repetitive labor, need such workers. The Third Wave economy, by contrast, is simply closed to larger and larger numbers of unskilled workers, irrespective of pigmentation.

On April 28, 1992, just one day before the Rodney King riots broke out and produced more than fifty deaths and over half a billion dollars worth of damage, the Los Angeles Times published a list of California's top 100 companies. Second Wave industries were conspicuously absent from the list.

Not a steel company or in automaker or a tire factory among them. Not a textile mill or a cement company. The key companies in the economy inhabited by Rodney King and by the ghetto young people who rushed into the streets to loot and burn are in fields like pharmaceuticals...computer soft-ware...medical insurance...investment ser- vices...medical laboratories...games and toys...semiconductors...medical imaging... management consulting...equipment leasing...banking...printed circuits...aircraft...radio and TV broadcasting... surgical supplies... title insurance...oil and gas... measuring instruments...telecommunications...and films....

There were a scattering of retail organizations, some construction, a bit of food processing, and a handful of others. But the list gives a perfect picture of an economy rapidly transitioning out of Second Wave low-skilled labor requirements and into the high-skill world created by the Third Wave.

These newer companies are the "basics" of the Third Wave economy spreading swiftly across the US, Europe, Japan and other regions. It is an economy whose primary resources are educated brain power, innovative creativity, rapidly learned and unlearned skills, organizational transience, and post-bureaucratic forms of authority. It is an economy dependent on instantaneous communication through

phone and fax; on computerization; on a vast, fast, globe-girdling electronic infrastructure; on computers, databases; and, above all, on new attitudes and even newer (and ever-changing) skills.

Many Jobs Are Gone Forever

This Third Wave economy - a new system for creating wealth - is not going to go away. The smokestacks and assembly lines of the Second Wave past are not going to reappear. They, and the jobs they supplied, are gone forever. Those old manufacturing industries that do return to profitability will do so with information-based technology, robots, and fewer unskilled workers.

Having failed to prepare for the Third Wave economy that futurists and others foresaw as early as the beginning of the 1960s, today's politicians stoop to demagogy. They demand protectionism as though that would put autoworkers back on the old-fashioned, pre-robotic assembly lines. They demand more mass welfare - as though more bureaucratic pro grams could solve the larger problem. Or they brandish free-market banners, as though the free market alone, without intelligent support and direction, would solve all the ills produced by the greatest techno-social transformation since the industrial revolution.

Politicians seem unaware (or unwilling to admit) that all their old Second Wave nostrums for unemployment are obsolete. In the old muscle-based, mass-manufacturing economy, if a country had 1 million unemployed workers, politicians could employ Keynesian or monetarist measures to stimulate the economy. This might create 1 million jobs, and the jobless workers would return to the factory or office.

Contrast this with today. In today's Third Wave economies you can create 5 million or even 10 million jobs - but the 1 million jobless workers won't be able to fill them. They lack the requisite skills. What's more, the needs keep changing so that even workers who have high skills face obsolescence unless they learn still higher ones. (Just ask the laid-off engineers in California's defense industries!)

The fact is that, in Third Wave societies, unemployment goes from quantitative to qualitative, which is why it is structural, intractable, and incurable with the remedies proposed by economists and politicians still trapped in Second Wave thinking.

Maybe education has to become distributed through all institutions of society, rather than schools alone.

The change from quantitative to qualitative unemployment is also why the upheaval in Los Angeles is likely to be repeated elsewhere again and again until political leaders recognize that the Third Wave is here to stay - that it is overhauling whole economies and the very structure of society. Finally, this kind of unemployment is why there can be no solution until a Third Wave revolution sweeps away today's Second Wave schools and replaces them with completely new learning institutions that no longer resemble the rust-belt factories of yesterday.

More money for schools without a deep re- conceptualization of education itself is to throw resources into the past, rather than the future.

More homework, more hours in the classroom, merit pay - all the usual suggestions are designed to make the factory schools run more efficiently with out attacking the fundamental incongruence

between factory-style education and a society in which factories and factory jobs may no longer be there for our children, black or white.

What is needed is a daring experiment with everything from vouchers, to home education, to new relationships with parents, to the use of computers not merely for drill, but for helping children to think and create. Maybe corporations have to adopt 11-year-olds and serve as para-parents, working with the real parents, where possible and actually teaching and training the children for Third Wave work in their own organizations. Maybe education has to become holographically distributed through all the institutions of society, rather than allocated to schools alone.

Maybe teenagers, as part of their education, need to become part of community service teams working to clean up the environment, build and reconstruct neighborhood facilities, manage traffic, care for the elderly, then return to the classroom for education linked to the actual solution of community problems.

The GI Bill, which gave US veterans of World War II vouchers for education in everything from Ivy League universities to automotive repair schools, was perhaps the single best piece of social legislation in the US since the 1940s. Why not use it as a model for young people generally?

There can be no permanent peace in the black and Latino ghettos of America, the North African banlieues of France, the barrios and immigrant slums of the rest of the high-tech world until all industrial-style institutions, from health systems and justice systems to transportation systems and, yes, political systems, are redesigned for a Third Wave society congruent with the new Third Wave system for creating wealth.

It is not merely the pitiful choice between a Bush and a Clinton (or even a Perot) that depresses and frightens Americans today. It is not merely anger in the streets that is tearing the country apart. It is the failure of any political leader ship to come to terms with a future that stares America-and all the other high tech nations in the face. Where there is no vision, clichés proliferate, people perish-- and cities burn.

ALVIN AND HEIDI TOFFLER are co-authors of the global bestsellers "Powershift," "The Third Wave," and "Future Shock."