THREE WEEKS THAT SHOOK MY WORLD

Last month I spent almost three weeks in the Soviet Union on a trip instigated by Gary Chapman, executive director of Computer Professionals for Social Responsibility (Palo Alto), and sponsored by the USSR's International Computer Club. Also along was CPSR advisory board member Sherry Turkle, author of "The Second Self." The formal purpose of the trip was to create and strengthen ties between computer professionals on either side; I joined as an interpreter/observer and as a CPSR member. As it turned out, computers are only a small if integral part of a much larger story: Perestroika and the stirrings of a free market in the Soviet Union.

CPSR is a private organization; except for its tax exemption as a nonprofit organization and the deductibility of contributions to it, it has no formal government standing. Indeed, it is mostly a government adversary, with "anti" positions on the Strategic Defense Initiative and a wary eye on government data banks.

The ICC, by contrast, is "independent" but very definitely government-sponsored, and espouses a strong government role in the computerization of the Soviet Union. It has government funding of about 10 million rubles for the current year, and close ties with a variety of government institutes and academies. This is only natural, since government organizations are almost all there is; "informals" and independent small-business co-operatives are still extremely rare. Still, we managed to find many of them; they are responsible for the vitality of personal computer activity in the USSR. Most of the computer and business stuff is first (pages 1 to 26), but please read the whole thing!

Gary Chapman and Dick Judy of the Hudson Institute have reviewed this report, and I have checked facts where possible, but I alone am responsible for its assertions and conclusions. Acknowledgements and further disclaimers on page 37. →

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A SOCIETY OF HUNTER-GATHERERS

To horrifying effect, the Soviet government and its Stalinist ideology have turned an industrial nation into a society of hunter-gatherers.¹ That is, its people see their world as an unpredictable environment over which they have no control, rather than a friendly, malleable place of tools and facilities they can manipulate productively. They go to work every day and get paid for showing up or even just for existing; there’s no real or apparent connection between their efforts and the money they receive. That money is merely tokens that enable them to forage and scavenge for chance shipments of tasty foods in shops peopled with rude clerks or a lode of high-quality 45-ruble slippers courtesy of a sidewalk vendor, just as the prehistoric hunter-gatherers were at the mercy of the weather and the random appearance of some tasty animals or berries. There are workers’ rights but no consumers’ rights. Lenin missed the point that even workers consume -- especially in a workers’ paradise.

Soviets are well-read, but they cannot plan their reading. Good books are passed from hand to hand, and sometimes laboriously photographed (not photocopied) page by page. Books are used over and over and shared with friends, rather than consumed once and displayed on a shelf or thrown away.

There is a joke about the store "Principle" in Moscow: In Principle, anything is available, and any legal activity can be arranged. Unfortunately, no one has managed to find Principle. While it is now possible and legal to do many formerly forbidden things, accomplishing any one of them may take weeks or months, and rob you of the time and energy to do anything else. You can register a business, but can you also find paper for brochures, and office space, and workers, and a telephone and a computer, and track down potential customers, and meanwhile change your child’s doctor, find a meaningful present for your spouse’s birthday, arrange a trip to a conference in Leningrad...? Each of these alone can take a day or more. And in the end, the laws on businesses such as the one you’re considering may change next month. They have several times already.

This situation deadens initiative and robs people of the sense of dignity that comes from control over one’s environment and the ability to produce things of value. (Is this why women, who can at least produce children, seem less bitter and prone to revolutionary action despite their harder lives in this sexist society?)

It has been said that the Soviet nomenklatura, or ruling class, treats its own country as a colony. But even colonists left more up to individual initiative than the Soviet government does, if only to get more work out of them. They taxed them, but did not attempt to control them in the counterproductive way that the Soviet government does.

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¹By contrast, China is more of a cushy jail, where people can work to live well, but have few political freedoms -- until last week, anyway. Political freedom in the Soviet Union has brought attention to its economic problems, but no solution. The person in the street’s attitude is, "Okay, the businesses and the Jews and the intellectuals have the freedom they want now, but what about me? I’m still waiting in this --- line all day to eat!"
The purpose of my trip was not to interview high officials and assess Soviet policy, but rather to get a sense of what it would be like to live and operate there. Three weeks is a short time and situations change (as we can see in China!), but you can't spend three weeks somewhere without learning something. Here are my conclusions:

- Life in the Soviet Union is tough and unpleasant, both for individuals and for businesses.

- The USSR is a land of contradictions, as George Kennan and many others have said. There are widely diverging opinions on the current easing of restrictions on political and economic freedoms. The differences in the US between Republicans and Democrats pale by comparison. It's a mistake to say "the government thinks..." Some people in the government think such and such; other people, equally powerful, disagree.

- Nationalism and anti-Semitism are also tearing the country apart. The Soviet Union's 285 million people (with a GNP of $2.4 trillion) comprise a host of different nationalities, with different cultures, attitudes and histories. The Baltic states and Georgia in particular are attempting to win their freedom from Soviet rule.

- Nonetheless, computers and economic liberalization, acting together and reinforcing each other, may improve things. However, this positive trend is fragile and depends on the government's willingness to cede control to decentralized forces. The notion that personal computers are a politically subversive force is almost beside the point. There aren't yet enough of them to make a difference, and the problem is economic, not political, freedom anyway. (To generalize, in the Soviet Union you can complain but you can't fix anything; in China, you can fix anything as long as you do so discreetly.)

- The differences between us and them are greater than politics alone. The pragmatism that governs much American political and economic thinking is alien to most Russians. Even among the reformers, many do not want capitalism, but rather socialism that works -- something that may or may not be possible.

- Corruption is not just a matter of a group of high-living bureaucrats whom the people can revile. Instead, it's an endemic condition; everyone cheats to get by. The result is that people have lost respect for the laws, their neighbors -- and themselves. Lack of power also corrupts.

- Although -- or because -- I can't predict the impact of such efforts, I believe we should engage in as much trade with the Soviets as makes economic sense (removing restrictions on technology they can easily get elsewhere anyway). At this point, trade and economic progress are likely to help the people, and may help the government to continue its halting steps to liberalization.
For all that, and even though there is rampant cynicism about the Soviet state even among its members, Lenin's stated goals of equality and democracy are still taken seriously. Morality is not a private matter. People are interested in efficient and fair allocation of resources, but greed is not considered the dirty, practical little secret it is in the US. Ends don't justify means.

Russians consider it honorable for people to wish to earn money for themselves and family, and to profit from their labors, but the "free" market is like "free" love to Russian eyes: It has all the legitimacy of prostitution. It may be "natural," but it panders to human baseness and respectable people don't approve. The relevant question is not: Is it legal? but, Is it right? Yet in a society where just about everyone breaks the rules, people perforce develop contempt for the rules and for themselves. At the same time, they're jealous and contemptuous of people who are even more reckless or more agile in a competition that corrupts.

What's a ruble worth?

If you accept the premise that the value of money is what it will buy, there's no easy way to translate -- let alone convert -- rubles into dollars. Forget the math; they feel different. Some things are cheap in the USSR -- a litre of milk at 16 kopeks, a metro ride at 5 kopeks, a phone call for 2 kopeks, an armful of flowers for a ruble from the ubiquitous flower stands -- but rubles still feel worthless. Even thousands of them can't get you a computer, a car, decent treatment from a restaurant or hotel. The exchange rate between subsidized daily necessities and useful imported equipment or luxuries is out of kilter. That's why rubles, which buy those little things, are not convertible into dollars, which buy the big things. The average worker gets 200 to 300 rubles a month; academy wages range between 180 and 350. One of the many stories I heard concerned a Soviet citizen on his way to France, who couldn't quite grasp that in Paris French francs might be even more useful than dollars.

As for the official math: A ruble will cost you $1.60 at the official rate, and 10 to 25 cents in the street. If you're Russian, you generally cannot buy dollars legally, but you may keep a dollar account if you have overseas earnings, subject to restrictions. Usually, it is businesses, not people, that earn dollars, and they too maintain government-controlled dollar accounts.

CO-OPS: NEW ECONOMIC POLICY REVISITED

But there is an analogy to the coming of agriculture in Soviet society today. The co-operatives -- government-approved private enterprises -- are for Soviet citizens what agriculture was for the hunter-gatherers -- a means of controlling their environment, investing in the future, engaging in productive activity so that efforts produce results. Carrying the analogy backwards, imagine what social dislocations farming produced. What did it do to the self-esteem of those who engaged in it? What envy and hatred did those early farms provoke? "Land belongs to everyone!" the early hunter-gatherers must have grunted. "Why should he have special rights to the ber-
ries in this field?" "He is eating well while we are hungry!" How many farmers were killed or plundered by jealous, less foresighted hunter-gatherers?

The Russian co-operative movement came into flower just last year. Before that, co-ops were legal in theory but the registration requirements were so onerous that few existed; now, theoretically, approval is routine, if slow. The first co-ops tended to be a legalization of existing moonlighting enterprises: taxi drivers, restaurants, repair work, and light manufacturing of all kinds -- T-shirts, buttons, and the like -- and high-markup resale of computer systems from the West. Overall, grey-market and now co-op activities account for a substantial portion of Soviet personal income, as much as 30 to 40 percent, according to some scholars.

But there's a newer phenomenon in the co-op movement now, the computer/software co-ops; the hardware traders have had to turn to programmers to justify the markups they're charging, since passage of a law limiting as-is markups to 11 percent. Where previously most of the co-op members and the black-marketeers before them were manual laborers or traders (yes, these distinctions do exist), now a new class is experiencing the joys and dignities of productive labor and the attendant, related rewards. Now the intelligentsia are participating, as programmers. "Truck-drivers and programmers are the most independent-minded people," says one programmer.

Macroeconomics

At this point the country is suffering from huge latent inflation, the famous 300-billion-ruble overhang. Everyone has more rubles than he needs: Nothing is worth buying, and saving is senseless at government rates of 2.5 to 3 percent and in the face of inevitable devaluation. The government is planning to devalue the ruble by half in 1990, and there's general recognition that it should be made freely convertible. But that would cause a huge upheaval since the official price is at least 10 times its market value. All this is why people willingly pay 50,000 to 80,000 rubles (or "rubbles," as many Russians inadvertently pronounce it) for a 40-megabyte XT clone.

In short, the poor are kept alive by subsidized food prices, and the rich are kept poor by a lack of any other goods. The government can't afford to end food subsidies because millions of pensioners would starve, so the argument goes, but there's got to be a better way. Meanwhile, rubles are a worthless incentive for workers, which accounts for the government's recently revealed plans to buy and resell about 5 billion rubles of imported items such as razor blades, soap powder, pantyhose, shoes and boots. This one-time event (all the government can afford even with huge markups) will of course be insufficient to soak up the ruble overhang, and it's controversial. The dirigiste forces would rather channel hard currency towards purchase of capital equipment and computers.

It's clear the Soviet Union can't go back, but that doesn't necessarily mean it will go forward. Far from withering, the state has replaced the people. Now that a few individuals are attempting to change the state, whatever their motives, it turns out that the people have withered to the point that they are incapable of working or acting outside the state system.

This could be the third time this century that "spring" turns back into winter (retracing the New Economic Policy of the Twenties which ended with

Release 1.0
21 May 1989
Stalin, and the long reform era after Stalin which ended, less dramatically, with the "stagnation" period of Brezhnev). If things go too slow, with continuing and increasing shortages of consumer goods while a few people get visibly rich, popular support will dissipate in a land where popular support now matters. If things move too fast, they may spin into chaos. A cynical view says that the economic reforms are purely pragmatic, a colonialist response to economic distress rather than a sign of enlightenment. So be it. Sometimes thinking follows doing. The current changes in the Soviet Union may not "work," but they cannot be reversed.

Economic progress depends on change and innovation -- exceptions that the system is not equipped to handle. Systems such as the USSR's don't adjust. With no mechanism for change and renewal, no capacity for evolution, the Soviet Union is brittle and susceptible only to destructive, revolutionary change. For example, remember how everyone quickly adopted the single-queue-breaking-into-many approach in banks and airline check-ins? That kind of spontaneous flexibility doesn't exist in the USSR. My hard-line free-market approach kept on confronting you-can't-get-there-from-here reality.

THAT EVENING IN LENINGRAD

Most of my almost three weeks were in Moscow, but Gary Chapman and I escaped (that's the word everyone uses) one weekend to see the sights in Leningrad. We left at 1 am Saturday on an overnight train -- a pleasant seven-hour ride being rocked asleep except for the smelly, slimy toilets and chancy nature of one's roommates -- and spent Saturday night in the Prebaltiskaya Hotel... in a room with individual climate control, two towels and enough space to walk around the bed. My room looked west over the Baltic Sea, where the sun vanished into a bright haze before darkness came around ten o'clock.

That evening we -- Gary, Sergei Ulin of the International Computer Club, Ludmilla the translator and I -- went to a co-op restaurant, Fantanka, for dinner. The restaurant had a prix-fixe meal and insisted on charging for it, even though the Russians weren't hungry. Fair enough, but they weren't very pleasant about it either. Regardless, we had an engrossing conversation after a day of chitchat in front of paintings and tsars' palace furnishings. This was our main opportunity to talk with the ICC folks, who were very hospitable but seemed to be continually busy hosting a variety of foreign delegations, most of them representing organizations more likely to be of use to ICC than we.

Sergei, a young man who joined ICC after a successful career with Komsomol, the Young Communist League, argued that the ICC should help select organizations that were most worthy of computers, and see that they got them. I talked about the price system: People who are willing to pay high prices are obviously those who best understand the value of a computer system and would have an incentive to use it well if only to cover their costs. Money is not a moral issue, I argued; it's an information issue. By paying money, you signify the value of an asset to you, and the market thus ensures that assets go to those who value them most highly.

Maybe, said Sergei, but the Soviet Union isn't ready for this. Factories aren't paying real money, and speculators are charging ridiculous prices so that only other speculators, i.e. co-ops, can afford to buy computers.
All you need is more co-ops so that competition will drive prices down, I answered. No, what you need is more computers; it is not so simple, said Ulin. All these people in co-operatives, they are speculators interested only in making money.

Not so. Many of them, in fact, told us that they feel their efforts are good for the country, that what they are doing is patriotic. Free-lance programmer Arkadii Borkowsky, for example, told Gary that he would have preferred to remain an academic programmer rather than go out and make money, but that he felt obliged to do so because he could do so. He acts as something of a role model and organizer for a lot of programmers, helping them to find jobs and helping co-ops to find contract workers.

No one was convincing anybody, and we left after paying 150 rubles for a third-rate meal and surly service. Outside six thugs -- that is, taxi drivers -- were waiting for us. Not one of them would take us for less than 30 rubles -- about 15 times the proper rate for a 15-minute ride. "See, here's your patriot!" cried Sergei. "He's working for the good of the country!"

We were well taken care of in Leningrad. From the left: Sergei Ulin of ICC, Ludmilla the translator, the guide and the driver, in front of the Winter Palace (Hermitage).

As it happens, one of them spoke English, and joined in the conversation. "Me, I drive a taxi to make money, to feed my family," he said, not for the good of the country. He rubbed his fingers together. But there was no budging on the price. We walked off, and found no taxis.

When our original man eventually drove up, knowing he had us, we got in and paid the 30 rubles. The conversation continued: It's not necessary that people intend to do good; the market forces them to, even as they satisfy their own selfish interests. "All that's needed," I continued brightly, "is more taxi drivers, to keep the prices down."

Not so, countered our driver. "We don't want more drivers. If new guy comes with lower prices, we have friends in police who will send him away." Okay, Sergei; there is a role for the government, but not the one you think.
Allyo? Allyo!

Sheer logistics can be a killer, too. For example, making phone calls in the Soviet Union is always an adventure. One out of four times you get a wrong number -- or, frequently after midnight, a wrong number gets you. Hotel phones are direct-dial in and out, although charged through the hotel. The practical result is that there's no way to receive messages. In offices too, all lines are direct-dial. If you call someone at work, you ring a particular phone at a particular desk. Usually, someone else answers (by saying "Allyo!" with no identification of person or company) and says your party isn't there. If you persist, the answerer might suggest another number to try, probably two rooms away. The JV Dialogue co-op, for one, has just decided to install a receptionist who will keep track of people, handle mail, etc., but they haven't yet solved the problem of separate phone lines.

The result is that everyone gives out home numbers, and much business is transacted between 8 pm and midnight. Most Russians don't spend evenings out on the town but go home to a working wife and a single child. "Most Russians" we met were male, of course. Despite laws to the contrary and high workforce participation, social custom keeps women largely subservient, and they're generally the ones who spend most time in the ubiquitous queues. I doubt it would be possible for anyone to hold a co-op job without another family member to do the queuing. Of course, there are high-ranking women who get coverage in the press here and there, but they wouldn't be newsworthy if they weren't exceptions.

This queuing business may sound like a trivial annoyance but a couple of hours of it a day can induce serious mental anguish and a huge drain on productivity. It's not like queuing at the Safeway: There are separate lines to pick the goods, to pay for them, and to receive them, and you have to queue separately in a variety of stores -- the bakery, the butcher, the dairy products store, the produce store, et cetera. The lines keep the stores crowded as long as they have any goods at all. This makes the street vendors relatively appealing, although you often have to queue just to find out what they're selling. The street vendors also win by letting you pay for and receive the goods in a single transaction.

Business cards and brochures are hard to come by because of the shortage of paper, and may be just slips of printed paper or the backs of cut-up cardboard calendars rather than proper cards. One of the constituent co-ops of Rekma (for reklama, from the French for advertising, and marketing) is in the business-card and brochure business. One of the most touching moments of the trip was a conversation with a would-be publisher quizzing me about my newsletter: "Do you have trouble getting paper each month?" "No, not really. The subscription fees more than cover the cost." "But if your circulation doubled, then you'd have trouble, wouldn't you?" Copiers are still extremely rare; I saw one on the entire trip.

People are routinely late, plans change without apologies, and no one gets very upset. The underlying feeling is that there are no opportunities to miss anyway, and there's certainly no urgency in overcoming competition. Sometimes I got the feeling that the co-ops were mostly selling to each other, and had no impact at all on the rest of the country.
MARKET REALITIES: THE SOVIET COMPUTER MARKET

I will describe the Soviet computer market anecdotally later, but here are a few facts, mostly taken from some excellent work by Richard Judy, Robert Clough and Virginia Clough at the Hudson Institute. Most of the mainframe and mini hardware is Soviet knock-offs of US equipment. Four Soviet government enterprises -- Minradioprom, Minelektronprom, Minsviazi and Minpribor -- make pcs, and have built an installed base of fewer than 200,000 USSR-made pcs (half of which are in schools anyway). Most of the IBM clones come from Taiwan and other places not subject to Cocom export restrictions, and are imported or brought in one by one by individual travelers. Judy, director Hudson's Center for Soviet and Central European Studies, estimates the PC-compatible population at 75,000 machines, plus or minus 25,000 -- or one-third to one-fourth the installed base of pcs. The installed base is growing rapidly, but the government is well behind its former goal of 1.1 million machines by 1990.

Cocom is the Coordinating Committee for Multilateral Export Controls, an independent organization bound only by agreements, not treaties, among its 16 members, which include the US, Japan, and most of NATO. Founded in 1949 and Paris-based, it restricts exports to the Soviet bloc of anything more powerful than XTs unless you provide full documentation for each machine, including the buyer, his address and the expected use of the machine. The paperwork takes anywhere from three to six months and is a little quicker in Europe than the US, vendors say. Back in the US, I ran into one sizable household-name US manufacturer who has been visiting Washington regularly over the last year in an attempt to get the rules relaxed, at which point he hopes to launch a large-scale effort to supply the Soviet Union with clones. He should be able to make a visible difference (and a profit) in a computer market as small and hungry as the USSR's.

Of course, right now the market is tremendously immature. There seems to be a blind faith in the magic of computers that bodes ill in the long run -- both for the country and for vendors who aren't prepared to stick around and make their products work. Over the past few months factories with hard-currency accounts have been recklessly buying pcs, with no real goals in mind. When I asked a couple of customers why they wanted computers, the answers were such notions as "to be modern," "to be automated." But the concepts of inventory management, budgeting, control, quality, forecasting, reduction in employment, or even sheer production increases rarely came up. One customer, a former professor who now runs operations at Moscow's Number-Two ball-bearings plant, has a somewhat better idea of what he wants -- better communication among engineers, plant managers and office workers, but he's taking it entirely on faith that computers will provide it (page 23). "Speaking frankly," he admitted, "the benefits are not quite clear."

This kind of thinking -- or lack thereof -- is behind the International Computer Club's belief that it should decide who gets computers, so that they can go to the most worthy users. Meanwhile, the government has already imposed restrictions that should make customers think a little harder about the purpose of their purchases: Factories can no longer pay for computers with dormant government accounts and transfers, but must instead use cash that they generally allocate for worker salaries and grey-market supplies.
On the software end, there are about 300,000 government-employed programmers in the USSR, versus 700,000-odd civilian programmers in the US and close to a million in Japan. Most Soviet programmers are busy reinventing wheels. Because there's no market for software (and no software copyright protection in a country where the concept of private property, let alone intellectual property, is suspect), each factory or office builds its own or contracts for it from one of the many ministry institutes supplying each industry. There's a central registry of software algorithms, but no way of telling which ones might be useful and reusable for any particular application.

In addition, there is now a growing but uncounted body of pc programmers, most of whom are familiar with DOS and its internals, and who make money writing low-end applications. These programmers are frequently compensated with access to hardware, which is far more valuable than rubles anyway. The ones actually making a living this way probably number in the low thousands, but the potential community probably includes most scientific graduates.

A Soviet pc: A bargain at 35,820 rubles!

Until recently, there has been little demand for the information-oriented benefits of computerization. When the state tells you what to make and controls your sources of supply, what more information do you need? Automating production processes may save a little labor, but the chief benefit of automation -- flexibility -- isn't relevant in an economy where volume rather than responsiveness to changing conditions is key. Conditions change only once a year, when you get a new version of one-fifth of the Five-Year Plan. "We're just interested in production," one manager told me, "because selling is taken care of [by the government]."

True, more and more factories are going to self-financing -- but this just means managing to a budget and a government order, typically 85 percent of production, instead of a quota. The factory is then free to sell any surplus and reinvest the proceeds, but it frequently has to rely on a government trading company to find customers, as in the case of the ball-bearing plant I mentioned.
Certainly, the exciting part of the Soviet computer market -- whether from the standpoint of what foreigners are allowed to sell or of where the growth and innovation is coming -- is the pc end. This is where the co-ops and the free-lance programmers are concentrating their energy, and where the importers and joint ventures can sell hardware.

Applications in use

"Personal productivity" is not a term you hear a lot in the Soviet Union. Lagging the US by several years, the Soviet Union pc market is starting out differently, with a higher percentage of networked, integrated systems -- virtual minicomputers generally tied to a database. The actuality of groupware comes as a natural thing even though the word is unknown. Pcs did not enter the market as personal computers, but as departmental machines that happened to be micro-based. They were rapidly put to work on departmental tasks -- letter-writing, database and the like.

Thus, the big market is for databases and languages. Soviet pcs, whether built abroad or in the Soviet Union, typically come with an English/Russian version of DOS and an English/Russian database application developed by the reseller for the user, usually using dBASE or from scratch. (Borland languages do well, but Paradox hasn't acquired much of a following.) On-line capabilities aren't necessary, since most transactions are made in cash (and recorded on carbon paper, as at the swimming pool, page 27); there's no need for real-time update or credit verification. Databases, except in large automated factories which use custom software, are used primarily for record-keeping. Employee databases are common; workers are paid in cash, so it helps to keep good records. Moreover, the workplace is also where people are assigned to vacation facilities, sports clubs and the like. However, the large number of people I met in jobs for which they had no training -- in a world where training rather than experience is what counts -- indicates a startling lack of the kind of skills-inventory systems that might help.

Lotus 1-2-3 is almost non-existent -- at first I thought that reflected the lack of pricing, marketing, forecasting and other tasks that spreadsheets perform. In fact, it probably reflects 1-2-3's heritage of copy protection. SuperCalc is widely used for pricing, which is based on costs plus a mark-up -- none of which reflect actual supply or demand. It is also used for production planning and other tasks. Generally, however, the government does its forecasting on mainframes, mostly using home-built software. The problem isn't the software, but the reality it inaccurately models: Agriculture suffers from weather that is routinely "worse than normal," for example.

Intellectual property

As noted, there's very little packaged software actually sold in the Soviet Union. Most mainframe systems are programmed from scratch, while pc software is unlicensed DOS and runtime applications of packages such as dBASE sold along with hardware by a co-op or distributed by the government. Now that they've been exposed to the idea of a market and private property in general, many people are starting to care about intellectual property as well. There's a draft proposal on copyright standards for software worked on by several people I met, but first it has to be passed and then it has to be enforced. There will be a seminar outside Moscow late next month to consider the draft and prepare it for presentation to the legislature. Several
luminaries, including leading Soviet computerization champion Evegenii Velikhov, will attend. Steve Ballmer, who recently visited Moscow for Microsoft, observes: "The problem with piracy is that most of the manufacturers are from the government. They're starting to understand that no one's going to support software over there unless they fix the piracy problem... Their own products aren't going to get a very good reception in the West either."

Soviet programmers generally dream of making a killing in the West rather than at home and finding some way to gain access to the hard currency they earn. (In the meantime, they can gain access to a computer by working for a co-operative that's installing hardware and needs customized software to go with it.) Only one programmer, Tetris author Alexei Pazhitnov, has actually succeeded on a grand scale in the West (page 24).

Willing buyers and sellers, far apart

The real problem with the USSR market is the lack of infrastructure. Just as I argued in my last issue (Release 1.0, 89-4) that Japan has an advantage over us in its ability to use our software effectively, so does the Soviet Union suffer a severe disadvantage in its inability to use our technology effectively. That means that vendors must provide extra support and that it's hard to keep your customers happy.

For the moment, to be sure, there's such a shortage of hardware that you can sell anything at almost any price, if you can get it past Cocom, and if you can get the hard currency out. Companies with hopes of doing anything other than shipping in hardware and collecting barter through an agent have to be prepared to help create the infrastructure that can use their products.

Robert Holt, representing an Austrian computer reseller, told us he was bidding on a contract to automate the Rossia, the hotel where we were staying, and that he was afraid of winning because it would kill his company. Yup! The real shortage in the Soviet Union is support and training, and the experience and incentives to make use of them.

Unfortunately, two key figures behind the computer movement have died (of natural causes) in the past year -- Boris Naumov, who ran both the USSR Institute of Informatics Problems and NMTK, the interagency scientific and technical committee for pcs, and Andrei Ershov, who spearheaded (without huge success) the introduction of computers into schools. Both were widely quoted and respected, but had difficulty making headway against the bureaucracy and lack of resources described here. They have been replaced in their jobs, but not in their roles as champions of the computer age.

The remaining visionary in this area is Velikhov, vice president of the National Academy of Sciences and newly elected to voting status on the Central Committee of the Communist Party (coincident with the mass "resignation" of 110 of the old guard at Gorbachev's urging last month). A friend of ours describes him as the problem -- because he is so bright and aggressive, he takes on far more than he can achieve, and delegates to underlings who lack his capabilities. His heart's in the right place, but he doesn't have enough hands. Moreover, says Dick Judy of the Hudson Institute, "He thinks in terms of a centralized environment, of hierarchies, which compounds the problem. The real issue is, How can they create a structure to spur computerization, not how can they install the computers themselves? Imagine if we had had to rely on IBM and the Post Office for the pc revolution. It would never have happened!"

Release 1.0

21 May 1989
THE BUSINESS CASE: SHOULD WE BE THERE?

It may be my newly sensitized eyes, but it seems that outside business interest and ventures in the Soviet Union are popping up all over. Autodesk, Microsoft and CompuAdd are all actively selling in the USSR, and many other vendors are "exploring." Moscow seminars for businessmen are advertised in the International Herald Tribune and NCR is sponsoring courses-on-a-cruise.

From a commercial perspective, the Soviet Union is a country of some 285 million highly literate, mostly scientifically educated people with skills complementary to ours. They represent a huge potential market for our goods at a time when the United States is reduced to devising new flavors of pet food and new scents of deodorants to keep its own markets growing. Pets in the Soviet Union eat table scraps (the farm animals eat subsidized bread -- which makes it hard to argue that the US should subsidize wheat sales to the Soviet Union), and many of the people smell for lack of soap.

But what does all this mean to US businesses? For most of them, it means, Don't bother. The payoffs are uncertain, the working conditions difficult, and there are better places to invest. "It's the easiest thing in the world to make a billion rubles," says Judy, "but then what do you do?" You can't convert them into dollars. PepsiCo, for example, takes out vodka and sells it in the West; it could sell a lot more Pepsi inside the Soviet Union than it does, but it can't sell the vodka outside. Robert Holt has taken all kinds of things in trade for computers, including one haul of 6 million beer bottles, valued at $400,000.

But there are arguments and situations favoring investment in the USSR. For starters, it makes sense for software companies such as Microsoft, Ashton-Tate, Autodesk and Borland, whose products are already there, and who might as well make a return on the "investment" others have already made on their behalf. In fact, while the intent of that term is ironic, reflecting the broad use of unlicensed software and modifications for Russian use, in fact there is also an investment that is real and valuable -- users' familiarity with and knowledge of the products.

So if you're interested, Ed, the folks at Inforcom would love to build and market a Russian version of dBASE for you. They'd also like to talk to Digital Research about GEM, which is much more popular in Europe (including Moscow) than in the US, and to Borland about all the Turbo languages. These folks are very skilled at building software, but they could do with a little assistance on the marketing and enterprise management side. (JV Dialogue has its hands full distributing and supporting the Autodesk and Microsoft product lines, and has pledged its full attention there.)

Are we helping them? Or hurting ourselves? (Boolean or)

But what about the moral/security implications? In general, I believe that it makes sense to sell the Soviets all the commercial technology they want (especially things available to all comers on the shelves of ComputerLand anyway). Anything that improves the country's standard of living can't help but improve the lot of the people and may increase the government's stability. A better-informed population and a technological infrastructure might ultimately help the military establishment, but with luck they would instead undermine it. Any help we give will improve the small odds that perestroika
will succeed. And if it doesn't succeed, the country won't be in shape to use the technology we send over anyway.

It's a risk worth taking. Besides, the government already gets most of the technology it wants, if necessary by the means ably described by Robyn Shotwell Metcalfe in "The New Wizard War." It's the people rather than the military that suffer from the government's inefficiencies and foreign governments' restrictions. Moreover, the culture and infrastructure that are integral to personal computer and software sales are themselves a force for decentralization, free flow of information and free markets. If they don't get those, we'll have taken their money for nothing. Companies such as JV Dialogue and other support-intensive outfits are endeavoring to ensure that there's genuine culture as well as technology transfer. The kind of technology the military uses is truly high-tech, while the trade I espouse is more along the lines of management techniques than pure products. These techniques will give people the human dignity they'll need if perestroika succeeds, and the courage and self-respect to resist if it doesn't.

WILL PERESTROIKA WORK?

Gorbachev's efforts are far more popular in the West than in the USSR -- but in a way that has more to do with the issues than with his personality. The people wish him well, and they desperately, impatiently hope he'll succeed, but many feel the job's simply too big for him...or for anyone else. After all, the West hears only his solutions to their problems; the Soviets know the problems themselves intimately and face them every day.

They wish perestroika would work faster, but already see the disruption this brings. Is there a point that will balance progress against backlash, a speed that is just right, or will any move bring so much criticism from both sides that all progress will be derailed and the country fall again into repression and misery or chaos and spasms? Perestroika has some vocal critics both among the people and among Party leaders. Certainly no one has any better solutions to offer -- but who ever promised that there was a way out? It reminds me of a game by Tetris author Alexei Pazhitnov -- lots of possible starting conditions, only a fraction of which have any solution at all.

Chaos theory suggests that equilibrium may not be attainable, and the Soviet Union will go lurching off into further instability as it has many times before: freedom of thought followed by repression, economic freedoms and moments of prosperity followed by hardships that finally engender "free markets" for certain goods or sectors or areas, such as the newly announced new economic zones the government is about to launch. But "freedom" can't be real if it's hemmed in as tightly as it is in the Soviet Union. Freedom and control can coexist only in perpetual conflict, but in a society such as the United States they can (we hope!) oscillate comfortably around a workable center (albeit with scary problems of drug use and crime right now); in the Soviet Union, the swings are wider and wilder.

Perception is reality

When I showed a draft of this article to an emigre I know (not in the computer business) we had a long argument. He thinks I'm too impressed with cosmetic improvements: "Nothing has really changed." As an emigre, he has a vested interest in justifying his decision to leave; as a reporter, I re-
ject the idea that I could be hoodwinked. "You know why they put that 11-
percent cap on markups?" he said (which I hastened to point out applies only
to unimproved products). "It's not because they care about the consumers,
but because they want you to break the law so they can get you if they want
to." Fair enough. And they can get you even if you don't break the law.

The emigre is convinced that I was followed by the KGB and that the people I
talked to are now on a list. I'm convinced I wasn't followed (if I was, I
wish they would have helped me that time I couldn't get a taxi and had to
hitch a ride from a drunken Yugoslavian!), and generally no one seemed ter-
ribly concerned about talking with me.

Whether or not I was followed, and whatever the motivation behind the laws
(in fact, many people were involved with different motivations), history is
hard to overcome. How can you encourage people to take risks when this kind
of thinking prevails? In the end, the motivation behind perestroika is not
monolithic, and the motivation doesn't matter if people don't trust it. The
bureaucrat who believes that perestroika will fail is not going to apply the
looser laws that temporarily prevail. Besides, the government has just
(April 8) passed a new law that could be used to squash criticism ("under-
mining the state") and provides penalties for anyone supplying computers or
word-processors used in that criticism. (It is substantially similar to
some old laws that have been tainted because of their association with the
past.) Will it be applied? The threat alone is enough.

In the end, all we in the West can do is try. Interference in internal
politics is a dicey activity, both morally and practically. But freer trade
is hard to argue with. Maybe if we add enough economic momentum to peres-
stroika we can help it succeed. It will surely fail if we don't.

Yes, you can now get things copied at the AlphaGraphics store on
Moscow's Gorky Street (the only one of its kind). If you're a
Russian who walks in off the street, unfortunately, it takes hard
currency only. Onlookers: Elena the translator; Sherry Turkle.

Release 1.0 21 May 1989
CO-OPS AND JOINT VENTURES: NEW FORMS OF ECONOMIC LIFE

There's a theory of the origins of life that asserts (broadly) that life began twice: First as an undifferentiated, vague metabolism that just grew and reproduced, and second as viruses that infected the metabolism and gave it identity and the ability to replicate with precision. The viruses live on today as our genetic matter, giving form and character to our metabolic being. You could say that the metabolism is the hardware and the genes are the software. The advantage of genes and viruses is that they provide for evolution and adaptability and transfer of information, allowing for change and diversity while the metabolism is kept free of error and works smoothly in the background. The metabolism was too noisy to hold the kind of complex information that the viruses can hold and transmit.

To extend this analogy to economies, a system such as the Soviet economy is all metabolism -- a living system, but without much ability to store or transmit information or to change in response to outside information. You could also add that the co-op movement is the first appearance of the second form of life -- viruses that may infect the basic metabolism and enable it to change and adopt new technology and adapt to new world conditions, while allowing the basic economy to run more smoothly.

Viruses infect the blob

As yet, the co-operative movement is a small part of the overall Soviet economy -- 1 percent at most. Moreover, it involves mostly service or light manufacturing efforts -- not the kind of large-scale heavy industry that wins the respect of most Soviets. On the other hand, it employs 3 percent of the workforce and is visible to all. In fact, the co-op movement is in danger of losing its freedom as the establishment sees it as a competitive threat -- which is starting to happen as the co-ops get into computers.

Nonetheless, the co-ops aren't all as low-rent as I first thought. We ran into a co-operative bus service between Vladimir and Moscow, 190 kilometers away, run by former Intourist drivers and using buses they were buying on time from Intourist (page 28). A co-op director I met had plans to rent part of a government factory during off-shifts for the production of audio tapes and diskettes (hot items that generally sell only for hard currency).

For the moment, the co-ops are giving people valuable business experience (genetic information that might transform the Soviet metabolism/economy?). But it takes time. How many people with two years' experience are running businesses in the US? The skills to produce products already exist, although efficiency and quality suffer from poor management. Missing is any notion of marketing, matching of supply and demand, employee motivation, etc. Even in co-op restaurants the staffs are frequently surly and unhelpful; tips and incentives can't overcome years of bad habits and a social culture that says service is servitude.

Keeping the Joneskis down

Yet the co-ops aren't perceived as fragile seedlings (let alone genetic material). In general, they provoke envy and scorn rather than emulation. "I tell my daughter not to tell her friends I'm a co-operative businessman," says co-op leader Marat Akchurin (page 33). "The obstacles don't upset me, but the attitudes do."

Release 1.0 21 May 1989
Those attitudes have some foundation. Many co-ops are indeed profiteering outfits, the natural heritage to the black-market enterprises that preceded them. Their prices are indeed high: There's little effective competition as yet to drive them down. State enterprises compete on price only, while the co-ops offer quality or sheer availability at prices that offend even the people who pay them, generally members of other co-ops. Only co-op members, foreigners and government functionaries can afford the prices in co-op restaurants and co-op taxi cabs. (Government taxi cabs rarely stop to pick people up; I guess they make quota early in the day.)

The co-op movement began a couple of years ago, when the government essentially legitimized the grey market. But it kept it stifled in practice, by approving co-ops only on a by exception basis, according to the ancient dictum "Anything not expressly permitted is forbidden." By mid-1988, new legislation reversed the situation: Anyone could register a co-op and gain approval unless there were specific reasons against it. A wave of "informal" organizations lined up for approval, which can take months, but provides access to banking facilities, hard-currency accounts for those who sell to or buy from foreigners (such as restaurants and computer resellers), legal standing and other protections.

Then in November there was the story of Artem Tarasov, who through apparently legitimate transactions managed to pull down the inflammatory sum of 3 million rubles, and publicized the fact. Public opinion against the co-ops worsened, and in December the government restricted co-ops from engaging in publishing, medicine and other sensitive activities. In response to legitimate complaints that some resellers were marking up their products by several hundred percent, the government limited markups to 11 percent. Accordingly, most computer resellers have gone into the value-added business with software, and continue to charge whatever the market will bear -- 80,000 rubles for an AT and 200,000 rubles for a 386 machine, still restricted by Cocom ($320,000 at the official rate).

**MY BOSS THE LAB MANAGER**

Where do the co-ops get their people, funds and resources? From the government metabolism, of course. Many co-op members we met continue to work at their government jobs, and frequently use their regular work facilities for their co-op work too.² Of course, there is nowhere to rent facilities from other than state bodies. The government organization charges a "market" rent for the use of its assets, but there's no market. This mirrors the way in which access to many facilities and resources is determined by where you work. (This includes passes to events such as the May Day celebrations, which I missed for that reason.)

You can easily think of all the delicate issues of conflict of interest that would arise from similar arrangements here in the United States. But consider it from the Soviet perspective: First of all, theoretically, the

²Judy cites these figures from Izvestia: Of 2.7 million people working in co-ops early this year, 1.1 million also had another job, presumably a government post. The total workforce is about 175 million people.
people own the means of production and their products, so it's all to the
good if the people use those means more effectively. For the moment, there
are a lot more resources out there than people willing to exploit them. (As
time passes, this attitude will surely change, as outsiders challenge in-
siders' claims to specific assets, but for now proximity is good enough.)

As a rule of thumb, a co-op is twice as efficient as a government enter-
prise. The government enterprise works at 10 percent of efficiency, with 90
percent of its potential wasted by bureaucracy, absenteeism, alcoholism, ir-rational practices, etc. The co-op works at 20 percent of efficiency, with
80 percent wasted fighting the government.

So, the assets get used more efficiently, and the people work harder. Sure-
ly it's a benefit to the economy as a whole if someone who had one job --
output unquantified but surely not high -- now takes on a second job. This
second job generates economic value -- and doesn't apparently reduce the
worker's contribution at his primary job. The effect of the co-ops for now
is mostly incremental production.

Co-op connections

Thus, most of the computer co-ops we met with were associated with one or
another government institute. (Many institutes and committees are part of
the Academy of Sciences and tend to contain scientists; other institutes
belong to government ministries and contain engineers who supply software
and production expertise to industrial enterprises). In many cases, high-
ranking institute/academy people held similar positions in a co-op.

Why do they form the co-ops instead of working harder at their regular jobs?
"In the institutes," says Mikhail Krasnov, of the USA/Canada Institute and
the Inforcom co-op, "there are too many restrictions. We can't hire a spe-
cialist to do some work that no one here is qualified to do. We can't pay
for good performance, and we can't force people to work or fire them if they
don't." It's not just a question of the members paying themselves, but of
building an organization they can control. Imagine trying to run a farm
with a collection of hunter-gatherers free to come and go as they please --
and with no incentive to pick up the plow.

Not only are the relations between government institutions and co-ops some-
what murky, so are the relations among the various co-op members. In most
cases, we couldn't get a clear picture of who owned what; "We're all friends
here" was the default response. In one case, a group told me that they were
now wrestling with this question; profits were to be reinvested and so the
question hadn't been addressed. (Legally, as far as I can tell, the owner-
ship is distributed among the voting members according to their co-op sal-
aries.) Co-ops also have workers who are not members. There are restric-
tions on the proportion of non-member workers, but in practice contracts and
other arrangements overcome these restrictions.

Overall, the co-ops are remarkably immature -- a collection of people with
no experience running anything, trying their hand at business. It's not un-
usual to find a complex co-op such as Contour, with interest including rock
group management, a faltering attempt at publishing Freud (page 33), a com-
puter club, metallurgy, a cancer cure, translation services and a travel
agency (for total revenues of 100 million rubles, according to its own

Release 1.0 21 May 1989
flier). Computer co-op Eleks is thinking of getting into farming, among other ventures. That's less surprising if you think back to the hunter-gatherer mentality that eschews strategy and makes use of the resources at hand. (Even in the US, in fact, the presence of a capable manager with knowledge of his market generally counts for more than a planned strategy carried out by someone hired by a search firm to fit the credentials.)

On a smaller scale, many co-ops are started by individuals who have no concept whatsoever of marketing. We were approached by one young man who wanted us to help him arrange a US joint venture to help market a database of Soviet commercial law -- a valuable offering for a lot of companies attempting to do business in a world where no one knows what the law is, although the laws are only a starting point. This young man had no paper to describe his offerings, no sample diskettes, not even a business card. Paper is tough to find, yes, but anyone who can't scrounge up a business card or two isn't going to survive long in any kind of free market, let alone Russia's struggling-to-be-born one.

Start-ups on their own

In fact, many of the USSR start-ups and the people behind them reminded me of their counterparts in the US -- tremendously bright programmers and engineers who haven't a clue about financial matters, marketing, people management and all the other issues that affect firms' ability to survive and flourish. The difference is that in the US eager consultants and landlords and sometimes even venture capitalists are falling over themselves to help -- and capable of doing so. In the USSR there's no infrastructure to provide the experience and know-how these start-ups lack.

And of course they have little knowledge of the foreign markets that so many of them expect to conquer. From a different perspective, the ICC's Sergei Ulin suggested holding a government-sponsored competition to determine the best products, which would then receive government assistance in reaching international markets. He didn't like the idea of letting the market make that determination for free, in its messy, uncontrolled way.

Zodiak -- more established than most

Unlike most of the computer co-ops I saw, Zodiak had something to see other than a couple of guys with an idea. Zodiak has its own facilities and a cache of 20-odd pcs in Noviye Cheremushki, a tony southwest Moscow residential area (where police protection for such valuable equipment is a great benefit). Zodiak was started by Igor Manko, who had run one of Moscow's two computer-repair operations for the government. Trained as a scientific engineer, he liked the physical, tangible satisfaction of fixing computers -- and, evidently, the physical, tangible satisfaction of running a co-op.

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3They're regularly flouted both by smooth operators who can wiggle their way around restrictions, and by government officials who know they have power on their side (cf. the case of Marat Akchurin and the Freud book). At first we thought we were getting contradictory answers to our questions, and then we discovered that half the laws people operated by weren't published documents but rumors, local government decisions and the like.

Release 1.0 21 May 1989
With support from Alexei Semyonov, a career academic who has put together a multi-computer operation to teach children Logo in Moscow's School 57, Manko is running a children's computer club, overseeing a programming shop and adult computer school and selling and installing Swiss textile-making systems to about 12 factories around the country.

Manko is the genuine article, too busy running his business to spend much time with curious visitors -- and uninterested in publicity because he already has a backlog of two years' work. His operation seemed low-key and, like most co-ops, somewhat arbitrary and eclectic in its choice of projects. If Manko had started out in the sausage plant business, or if Semyonov were a BASIC bigot, Manko could just as easily have followed those directions.

WILL YOU BE MY JOINT VENTURE?

Some co-ops are allowed to have hard-currency accounts, but they don't have much way to get hard currency except for restaurants which cater to foreigners. Joint ventures with foreign companies offer access to hard currency, a partner who might pay for travel abroad, and other delights. While there are some 80,000 co-ops, which require only a government registration (not a trivial matter, to be sure), there are only about 400 joint ventures, which require a consenting foreign organization on the other side. And fewer than 100 of those joint ventures are active. However, the total number is growing fast and should approach 1000 by year-end, especially now that foreigners aren't restricted to less than 50-percent ownership. At least half the co-op members we met asked us -- a public-interest organization head, a researcher and a journalist -- if we'd be interested in forming a joint venture. It became a sad joke.

There are a couple of joint ventures in the computer business -- notably Interquadro (whom I never actually met), which seems to be mostly in the computer resale business, and Dialog, which has a joint venture with Management Partnerships International of Chicago. (USSR companies aren't the only ones with widely varying interests. MPI founder Joe Ritchie is also chairman of options-trading firm Chicago Research and Trading Group, and separately heads a group bidding for Eastern Airlines.)

JV Dialogue -- an atypical joint venture

JV Dialogue was the closest thing we found to a Western-style company. (Its Russian name is Dialog, but it goes by JV Dialogue overseas to avoid trademark conflicts.) JVD was started 18 months ago by Peter Zrelov, who had run MIS for the Kamaz truck plant, with support from Moscow State University and a physics institute, among others. The company is focused on the computer business, beginning as a computer reseller and software house and now running training centers and contemplating expansion into computer assembly. Often computer resellers' value-added is nothing more than a database, but JV Dialogue was one of the more legitimate enterprises. A local five-percenter (broker) introduced Zrelov to Joe Ritchie of Chicago Research, who was looking to do business in the Soviet Union, and negotiations began.

The resulting joint venture was based more on Zrelov's character than on any specific business plan. Good people can find resources, and in the Soviet
Union they can certainly find a market; the shortage is of people to carry things through. To represent the U.S. side Ritchie brought in Jack Byers, who had previously run several systems integration businesses in the US, and created Management Partnerships International as a vehicle for ventures that ultimately will extend beyond the USSR. Byers has ideas about employee motivation, teamwork and responsibility that are pretty strange to most Russians. In short, he believes that people should work together, but that each one should carry his own weight. They are not so much equal as interdependent, and focused on accomplishing tasks rather than individual effort. This sounds socialist from a US perspective, and dangerously inegalitarian from a Soviet one. Which is probably an indication that it makes sense.

JVD has resold 3500 pcs (mostly from CompuAdd of Austin) in its 18 months of existence, and has plans to open a 10,000-square-meter computer-assembly plant north of Moscow, most likely using parts and designs supplied by a Swedish firm. It also resells software for AutoDesk, Microsoft and SPSS, and builds custom applications. Somehow it's fitting that Microsoft and JV Dialogue should have teamed up, since both seem to be leaders -- although JVD is definitely closer to the Microsoft of ten years ago than the one of today. Of all the places we visited, it seemed the most full of programmers, with the fewest academics. (Remember that Bill Gates was a dropout, even though he's one of the more intellectual people around.) All in all, it was a pleasant place to hang around, although perhaps a little more chaotic than it should be. There's an employee cafeteria to encourage company spirit, provide an extra benefit, and save the time employees would otherwise spend scrounging for food in a somewhat desolate countryside -- yet another Moscow suburb, this one to the south.

JVD Dialogue is representing Microsoft for retail sales, but, as Microsoft's Ballmer drily notes, "they're a [would-be] manufacturer themselves and probably not the most objective in representing us to other manufacturers" for DOS (and someday OS/2). JVD is opening 36 branches across the country to do local sales and support, generally in association with local universities, which is where all the talent is, says Byers. The company is also working on localization of DOS and Works, with other products in prospect.

While I was there, the JVD/Microsoft held a formal seminar announcing QuickPascal and discussing "obyektno-orientirovannaya" (object-oriented) programming. Peter Kvitek, a newly hired JVD programmer who is working on EVAfont (for Cyrillic and other fonts), a mathematical/graphics package and other delights, told me how valuable Microsoft's visit was to him. It wasn't the information about Microsoft's products that impressed him, but the chance to talk to Microsoft people about how they do things: How long does it take to build a product? How many people? Where does QC fit in? And so forth. The Soviet Union has thousands of capable programmers, but nary a product manager among them.

Lee Felsenstein's and Inforcom's Glav-PC -- Home-brew business?

Lee Felsenstein, a co-founder of the Berkeley Community Memory Project, wants to do it over again in the Soviet Union, and do it right. A self-styled revolutionary, he regrets that in the US "the spirit that attracted me to the personal computer industry has been submerged by commercial impulses." He sees the Soviet Union as fresh territory for another chance. I'm not sure the Soviet government knows what it's getting into, but on the
face of it Felsenstein's proposed Glav-PC will "provide services to support the development of the wholesale component of the personal computer industry." That means a showroom, training, maintenance, sales offices and the like. The purpose is to provide the necessary installed base for the second stage of Felsenstein's plan, an extension of Community Memory Project into the Soviet Union. He describes it as a medium for publication, or "hyper-text for graffiti." At the moment, the project has the interest of professor Dmitri Cheryeshkin, head of a laboratory at the Institute for Systems Studies of the Academy of Sciences, who is working directly under Velikhov to design municipal information systems.

Felsenstein is hoping to set up a joint venture with Inforcom, a well-connected co-op with some 50 members and 50 to 70 people on contract assignments. Inforcom's primary sponsor is the Institute for US and Canada Studies, a unit of the Academy of Sciences, with assistance from the Ministry of Foreign Economic Relations (which absorbed the Ministry of Foreign Trade last year; "We still have the relations, but no trade," goes the inevitable joke). Inforcom has a number of sophisticated social scientists and trade experts who understand business theory and best of all business practice. A lot of its services are management consulting and foreign-trade advice, and it has an in with the two free enterprise zones the government is planning in the Far East and Georgia.

Inforcom's software section chief, Mikhail Krasnov, runs the Institute's computer center ("lab"). Much of its computer work so far is Russification of US programs -- with add-in software that observes copyrights, Krasnov hastens to point out. Krasnov's goal is to make the development of software in the Soviet Union "more rational... Ninety-five percent of our programmers are doing useless work. There are ready-made products, but they don't know them or they have no access."

...and Ashton-Tate

Inforcom is also angling for a deal with Ashton-Tate. A-T, however, is still trying to make up its mind exactly what to do in the Soviet Union. Next month, it will be participating in the software copyright seminar to consider the draft law prepared by Dialog and others. Copyright, hard-currency access and political risk are key factors in A-T's deliberations, says Herman DeLatte, southern Europe managing director for A-T, but he sees the USSR as an appealing long-term play. For now, the company has contracted to have Framework III localized by the Leningrad Academy of Sciences, which already has done most of the work for its own use.

THE UNALIGNED: FREE-LANCE PROGRAMMERS

Aside from the semi-establishment co-ops spun off from (or hanging from) the institutes and academies, there's a sizable community of freer spirits who work outside even the limited structure that inhabits the institution-sponsored co-ops. Most of them seem to make their living writing applications for offices and factories, using dBASE or Microsoft or Borland languages, and hoping to make a killing with Russian spelling-checkers and dictionaries. These are the same sort of hackers you'd find in the United States, but they are politically minded because they have to be. Perhaps
the greatest freedom that the US affords us is the freedom not to fight for freedom but to have it by default.

As with any community, many of the capable programmers know each other and trade work and contracts on a regular basis. One of these is Arkadii Borkowsky, who had his 35th birthday party while we were there. It gave us the chance to meet the cream of the hacker establishment, including several who had come from Kiev for the event.

Some of them believe they are helping their country by their work. Certainly they are motivated more by hunger for respect and intellectual challenge than by greed. The amount of money that would make a difference in their lives is unimaginable. (Even for foreigners with hard currency, most of what we wanted -- good service, on-demand phone calls to the West, milk after 10 am, camera film, spontaneous travel -- was available only sporadically and unpredictably.) Their motivations are different, as they are in the US. Many of them are emigrating not for money or even for freedom, says Borkowsky, but for the chance to work with 32-bit machines and other truly high technology. (This is a plea for eased Cocom restrictions, of course.)

While the Soviets may lack the ability to use computer technology effectively, they are rich in fundamental technical capabilities and intelligence. Forgetting statistics, I'd say that the Russians are probably the most intellectual people in the world. The Japanese may be better educated as technical engineers, and other countries may send a higher proportion of people to university, but the Soviets have enough time on their hands to read and think. Unlike many other disadvantaged people, they are well aware of their situation.

Russian groupware

One of Borkowsky's circle is Maxim Khomyakov, a fiftyish dissident who twice lost academic jobs because of his outspokenness and his Jewish "nationality." Khomyakov is now a free-lance programmer and the head of Terminal, a smallish co-op that and also resells computers with custom or packaged software, including Djinn (or Genie), a Russian TSR dictionary Borkowski wrote (just under 300 rubles). He lives in a small apartment on Avant-Garde Street north of the center of Moscow, and has to clear his computer off the living-room/bedroom table so his daughter can do her grade-school homework. (In the other bedroom the daughter proudly showed me a mother cat with three newborn kittens.)

Precisely because most application software in the Soviet Union is custom, it is easier to sell new ideas and eschew standards, and such is the case with Terminal's new soup-to-nuts software project, Chaos (for Concurrent Human-Assisted Object System). Terminal is going to the trouble of building a whole new object-oriented operating system for Chaos, since that is how it will work best. In the US market, this would be a crazy idea, but Khomyakov
is selling into a market where interoperability and connectivity are still distant issues. Khomyakov will use Chaos to build applications for two customers for an estimated 50,000 rubles each: Moscow's number-two ball-bearing plant (built first, but second in size), and a meteorological institute, not to forecast the weather but to keep track of the center's operations. Both will operate in environments that will remain totally under his system's control.

The basic idea of Chaos is to build a system that will control interactions among people and monitor the progress and completion of their work. It may sound a little odd to find something so advanced as "groupware" in the USSR, but in fact it's the most natural thing in the world -- the automation of bureaucracy. "The aim of our project is to hand over the task of maintaining order in such a complicated dynamic world to the computer," says a Terminal position paper/fundraising document. "Only after humans are freed from all the harassment involved in maintaining order in their affairs, can they begin to hand over specific human intellectual functions to the computer." (Emphasis mine; his dot-matrix printer doesn't have italics.)

Of course the moral question remains: Is it right to automate the bureaucracy, or would it be better to subvert it? In fact, bureaucracies are most troublesome when they do not work -- when they slow things down, or when they say no because a person doesn't want to take the risk of saying yes. A properly programmed bureaucracy is relatively low-cost once it's working, and can easily be programmed to say yes in all the appropriate cases. A person may find it easier to say no, but a machine will do whatever it is programmed to do.

Tetris author Pazhitnov

I met with Tetris author Pazhitnov, 34, a couple of times. Success hasn't changed his life much except, he says, that "now I have more possibilities" to write games and possibly to travel to Japan and the US, where he has never been. He lives on the fourteenth floor of a typical Moscow apartment building in a flat slightly larger than the norm (separate living room and a balcony) with his wife and two children and a computer -- a mark of success but hardly of great luxury. The rights to Tetris are in fact owned by the Academy of Sciences of the USSR, where he works in the computer center; it now has an increased hard-currency account because of Tetris. While Pazhitnov doesn't have any direct access to that money, it certainly colors his relationship with the academy (not a topic he cares to address).

He's not enthusiastic about the various versions of Tetris that have appeared on the market with military Russian backgrounds -- missiles and the like -- but he's not a complainer. He has just finished some more games which he hopes to sell through Dialog and also through a Japanese firm that is starting to nibble. Like Tetris, none of the games is very realtime, putting a premium on strategy rather than coordination.

The most intriguing, to our mind, is Muddle. It requires you to move a set of eight objects around a 12-by-12 screen and move them off the screen in specified order. Each object has four characteristics -- foreground and background colors, shape (square or round) and suit (spade or club). Each of four keys moves all the objects with a given characteristic, so that you have to think carefully. There's a large number of possible beginning ar-
rangement of objects (roughly $140^8$, I believe) but only a small fraction of those are soluble; Muddle can provide arrangements at a specified level of difficulty and with guaranteed solubility. As I mentioned, the game reminds me of the Soviet Union -- each step forward in one area generates backlash in another; each loosening here provokes excesses there and countermeasures somewhere else again.

More enticing, and more interesting to Pazhitnov himself, who has now moved on to designing games and assigning the coding to others, is Biographer, a psychological profiling system he's been working on for five years in conjunction with a psychologist, Alexander Kronick. It asks you to list 15 important events in your life, past and future, and then prompts you to assess them and the relationships among them. The result is a remarkably sophisticated analysis; it won't replace a shrink, but it's more candid and more objective than many a friend. Hint: For starters, your selection of events may indicate an excessive preoccupation with the past, or a tendency to expect too much of the future that would be fine in a 20-year-old but a sign of unreality in a 50-year-old. These and other insights may not be the most original in the world, but they are compelling and unique when applied to real people who might use the program.

Reading the Moscow News, one of the more outspoken papers to flourish in recent years. It's cheap -- only 20 kopeks, or 30 cents -- but there isn't enough paper to print all the copies people want to read.
As it happened, during our second week there was a conference on "informatization of [Soviet] society's productive capacity," organized by a long list of member academies of the Academy of Sciences. Though it was billed as "international," we and a team of US students led by Soviet computing authority Seymour Goodman from the University of Arizona were the only Westerners among the 200-odd delegates. (The site, Suzdal, a village near Vladimir 210 kilometers west of Moscow, was billed as a tourist attraction because of its churches. Unfortunately we didn't get to see them.)

The ostensible agenda of the conference was to discuss three "concepts" -- position papers is probably the best translation -- outlining the desired course of Soviet computing. A synthesis of these will be presented to the government this summer to help it formulate its policy.

The three concepts were roundly criticized, mostly for their focus on technology at the expense of people. People must be ready to use all this equipment and information, Ustus Agur (among others) argued. And they must know what to use it for. Learning computer languages for sheer pleasure is a worthwhile, noble calling, but it isn't going to solve the Soviet Union's economic problems. Just as its citizens may read English but can't speak or use it in commerce, so will they know how to program without knowing what to program.

Many of the attendees seemed to think that there should be more reliance on individual initiative and a more business-oriented, practical approach (although maybe I imagined more of this sentiment than there actually was). However, that's a matter of degree. I don't think anyone could even imagine the kind of free-form, uncontrolled marketplace we had in mind. Somehow I kept on thinking of the old story about consultants -- people who know 100 ways to make love but don't know anyone of the opposite sex. These people knew information theory and automation technology, but they had never met a live software product or a real engineer.

Overall, it struck me as excessively academic. The big issue was that computerization means more than machines and data; it means education and training -- and ultimately, a better-informed population. But the fundamental assumption -- that it was up to the government to make sure that it all happens -- didn't seem to meet with much challenge.

Yet once we had formally introduced ourselves with little talks, people swarmed around us to tell us about their co-ops, ask us about forming joint ventures and the like. That at least was heartening.

As a side note, among the most interesting of the short talks (prepared responses to the mornings' formal sessions) was Estonian Agur's plea that attendees remember the non-Russian republics and not settle for a one-size-fits-all strategy.
SCENES FROM EVERYDAY LIFE

Everyday life in Moscow is hard, especially if you’re not a foreigner, and especially if you’re Jewish. It’s hard to pin down, but I always seemed to meet the rudest treatment in the company of Jewish people, and there’s certainly a tinge of anti-Semitism in the anti-co-op backlash. Whatever your "nationality," the stories are true: I never saw Pravda in a bathroom, but the Institute of Applied Mathematics offered computer printout. Most stores are empty of interesting goods by mid-afternoon. In our own hotel, people showed up at the cafeterias on each floor with plastic bags and bought oranges or sausages or roast chicken pieces by the dozen. Several times on my way to the restaurant for breakfast (kasha and coffee with mysteriously chunky milk) I would see milk on sale and decide to pick some up on the way back because there was a line. But by the time the line had gone, so had the milk. Coffee, incidentally, is made by mixing grinds in with boiling water; don’t drain your cup!

Not being a fan of the lines in stores, I tended to go hungry or eat fast food when I saw a vendor not surrounded by crowds. The ice cream, piroshki with cabbage (not the meat kind!) and muffins are fairly good, but wouldn’t make a steady diet. On the other hand, it’s clear that good health is a luxury Soviet citizens can’t afford -- and there’s no escaping the gritty, polluted air, the constant smoking in offices, and the water that occasionally runs the color of tea. (I drank it all except with no apparent ill effects, but three weeks is hardly 30 years.) I did manage to find a swimming pool, but its hours were hardly conducive to regular attendance by anyone with a job -- and therein lies a tale.

Swimming pool story: seances all day

Part of the value of indulging in a minor eccentricity abroad is that it gets you off the beaten track to meet local people. The swimming pool was in the basement of our hotel, the Rossia (a monstrosity that sleeps 6000, mostly school groups and visiting businessmen from Bulgaria, as far as I could tell). On the ground floor was a woman behind a counter whose sole job appeared to be to sell tickets to the swimming pool, at 1 ruble 20 kopeks a throw (bathing cap rental 10 kopeks extra). She filled out these serialized tickets with a carbon copy for her records, noting the precise session and date for which each was sold.

These sessions, called "seances," last 45 minutes apiece. There is also 15 minutes allotted for shower time and 15 minutes for getting dressed again. Occasionally there’s also a break for the pool staff. In the end, the pool is available for use for only six hours a day between 10 am and 9 pm. And you have to arrive at the right time. On the other hand, although they were fierce about the schedule and grumbled at ladies who complained when their lockers weren’t opened right away, the pool staff of three or four on our side (and presumably the same number for the men, plus the lifeguard) were quite friendly and delighted that I liked their pool.

Now you can think about this and wonder why it takes so many people. Why couldn’t a pool attendant both sell and collect tickets? Why couldn’t the swimmers have keys and open and close their lockers themselves? But if you were to make the whole country efficient at one fell swoop, you’d have a massive unemployment/retraining problem. And so nothing happens.
Lassitude reigns

As noted, nothing assumes great urgency in the Soviet Union. I saw great indifference to whether scheduled appointments actually happened, phone calls were returned, whatever. I twice had a scheduled dinner canceled when I called to confirm. I learned (after thoroughly annoying my partners with my neurotic time-consciousness) to schedule only two appointments a day, plus meals. Sometimes people were late or taxis refused to take riders; sometimes meeting places (including the JVD/Microsoft press conference and an Interquadro event I never did find) weren’t marked and it took half an hour to find them. Sometimes there were just misunderstandings.

One day, for example, an academy official I had arranged to meet showed up 20 minutes late, at 10 to 2. We sat in his car for another 30 minutes until, finally, I asked tentatively, "Didn’t you say something about lunch?" "Oh, yes," he replied. "We’re just waiting for my wife and son." Yes, he had mentioned them when we set up the appointment, but not since. At 3, the wife and kid showed up, with a story about the kid’s fishing that had kept them from arriving earlier. Our group assembled, the father decided that we should eat in the Hotel Mezhdunarodnaya (International), a pseudo-Hyatt favored by American businessmen -- and closed to ordinary Soviet citizens. As we neared the entrance, the man turned and said with bravado, in English, "It is our fashion to speak in English in front of the portieres [i.e., porters, i.e. guards]." Well, we passed. Since he had invited me, the next task was to find a restaurant that would take rubles. The first one -- the Russia, oddly enough -- took only hard currency. Likewise, the next. Finally we found a dank and forbidding place that carried no warning sign. But here we were ignored. "Let’s go," I said as the maitre d’ passed by for the fifth or sixth time. "This doesn’t look very good anyway." And suddenly the lights went out entirely, so that there was only a dim glow from the foyer of the hotel behind us. None of the diners seemed terribly surprised.

But it was a point of honor by now. "Ask for a table in English," my Russian friend pleaded. I did, and the maitre d’ asked if I lived in this hotel. "No, in the Rossia." "Then you may not stay," the maitre d’ said. "You should have said you lived here," my friend hissed. If I lived in Russia, I surely would have learned to lie by now.

As it was, we drove off in search of a friendlier place. The first one was closed for its afternoon break. The second was under remont. The third, the Trest, was open and had space -- although it was out of most of the items on the menu. At 4 o’clock, the waiter brought the first food I had seen since breakfast. At 5, lunch was over.

The co-operative bus

Contrast that with an earlier day, when the three of us were attempting to leave Suzdal. At 9.30 I received a message to get ready quickly; our bus would leave at 10 for a quick sightseeing tour on the way to the train station some 30 miles away. At 10, no bus. At 10.30 a bus, but some trouble with the driver. Elena, our translator/guide, had made arrangements with his boss, a local Intourist representative, but he was having none of it. He refused to take us. At 11.30 we left in another van. We got to the station early for our train and saw a man with a megaphone rounding up passengers for a co-operative bus to Moscow at 4 rubles a head for the three-hour

Release 1.0

21 May 1989
ride, a little more than the government train. When it filled up, off it went. We climbed aboard the next bus, which likewise took off when it was full. Our translator, by now recovered from the morning's disaster, offered the driver a chocolate and won his heart. On schedule, the co-op bus arrived at the train station in Moscow, and everyone alighted. We were looking for a taxi when Elena told us the driver would be delighted to take the four of us to our hotel for an additional five rubles total. So we piled back into the bus for a free-market ride to our hotel.

As a government institution, the metro bears mention. It runs impeccably on time, with electric signs at the entrance of each train tunnel marking the time elapsed since the last train has left (rarely more than two minutes). In days and days of riding, I saw only a single car without working lights, and no delays. All the platforms were clean and all the escalators were working (in sharp contrast with the London tube, to say nothing of the New York subway). When I go back, the one appointment I really want to arrange is with the director of the Moscow metro; he must be a proud, happy man! If only any other sector of the Soviet economy ran as efficiently.... Buses and trolleys, for example, were routinely late, dirty and crowded, and had to make detours around streets in seemingly constant "remont" (repair).

A TALE OF TWO DRIVERS: YURI AND MISHA

One problem in Soviet society is the tremendous waste of minds as well as resources. The scientific establishment of the Soviet Union is twice the size of the United States' -- and each year produces legions of trained young people with nothing to do. These are the lumpenintelligentsia, PhDs and engineers and philologists who work as drivers and translators because they couldn't get or didn't want a sinecure at an institute or academy. Two such were Misha and Yuri, whom I met on separate occasions. Each works as a driver for the head of a co-operative. Misha will be a success, it's clear, and would be a success anywhere. Cheerful and well-fed, he has lucked into a great job: He works as translator, language teacher, driver and general aide-de-camp for his boss, who runs a successful co-op. A university graduate, Misha could sit in the back room and be a programmer, but he prefers to hang around the action and see how a business is run.

Yuri, on the other hand, is thin and bitter. He too works for the head of a co-op, and gets to program the co-op's single computer when his driving services are not in demand. Trained in physics, he got a job in remote-control systems, moved around a bit, and ended up where he is. He's frustrated because his boss doesn't understand the value of the computer, even though this co-op is affiliated with a complex co-op that has a computer unit. He doesn't think he could make the move to another part of the parent co-op. He's used to being moved around and doesn't seem to regard the co-op as much different from the government that has moved him around without much regard for his individual qualifications for all these years.

Come closer (or, You can use this if you want, Woody)

One peculiarity of Americans is the distance they keep from people; they're always edging away from Russians, who tend to touch the people they're talking to. One day I was standing next to a large pillar talking to a Russian. Little by little, he advanced; little by little he backed away. If it had lasted long enough, we would have circled the pillar completely...
THE ROLE OF INFORMATION AND KNOWLEDGE

Information is a curious thing. In the last few years, it has become possible to say almost anything without fear in the Soviet Union. People would argue with me, but they never seemed to doubt my right to say something. Nor did they pretend to misunderstand the way people do when something is too outrageous to listen to. While our ICC hosts were friendly, they didn't seem too concerned with whom we were seeing and where we were going; the close contact during the weekend in Leningrad was unusual. After Gary and Sherry had left, in particular, I spent days on end roaming about entirely on my own, seeing people I had found for myself.

Giving a speech at a large meeting of computer enthusiasts, mostly state employees, I began rhetorically with the question, "Who's afraid of the government?" I expected at most a couple of hands to go up, so that I could lead into the follow-up, "Suppose the government had complete information about everything you did; wouldn't you be afraid then?" But so many hands went up -- amid laughter -- that I simply went on to say that we're not afraid of our government, partly because we have laws protecting our privacy...

In general, there's little concern in the Soviet Union about privacy, and presumably skepticism that the government would obey privacy laws if they existed. At the moment the complaints are generally that the bureaucracy is not efficient enough, that you need different identity cards for different purposes; it would be much more convenient for everyone to have just a single number...4 (Gary really gagged on that one! However, there are a few groups concerned with privacy and other such matters, including the co-op Perspektiva, which gathers and disseminates information on social movements and organizations.)

But it's not enough for information to be free in principle; it must be reliable. In a world where information has been controlled so carefully for so long, people are at sea trying to assess the reliability and purpose of information from a bewildering variety of sources. They don't have the long experience of source-analysis that we have.

Information, yes, but no feedback loop

Secondly, although there's now lots of information floating around, it doesn't flow back into the system; the government's metabolism can't absorb it. For example...

As May Day approached, the red flags and the Lenin pictures and the signs proliferated in the streets: "We wish you a happy holiday!" "International peace." Certainly no one -- not the officials who had ordered the signs in accordance with past practice, nor the workers who put them up, nor the people who read them if they still noticed them -- believed in their sincerity. Yet they were still there. When I see a "Have a nice day" sign, I

4One of the books I was reading mentioned a saying popular in the Hapsburg era, that power was mitigated "durch Schlamperei," or through sloppiness. This seems entirely appropriate in the USSR, too.

Release 1.0 21 May 1989
believe in its sincerity at some level; the store owner genuinely wants me
to receive his message, if only to encourage me to buy something. When I
read a claim of high performance or revolutionary technology from a vendor,
I may not believe it, but I figure that the vendor believes it, or certainly
wishes it were so. Vendors who don't believe in their products don't last
long. On the other hand, the bureaucrat who ordered the signs...a holiday
greeting isn't going to help him keep his job. Of course, he probably never
ordered the signs; he just didn't deorder them. Why risk the change?

This is the fatal flaw of the Soviet Union -- the danger of monopoly, with
its lack of diversity and incentives for change. The Soviet Union has had
the same government for 60 years. There have been changes and reaction to
the outside world, but none generated by competition with the outside, no
choice among alternatives. Those inside have chosen their own replacements.

Although the comparison ignores some obvious differences of fundamental in-
tent and power and would be considered insulting by both sides, I kept
thinking of IBM. Both IBM and the Soviet government have grown hidebound.
Both have lots of internal competition but have been slow to react to change
in the outside world. Both are now in the hands of reformers, but it's un-
clear whether the reforms will take. And in neither case can I think of any
leader who could do better than the one in place. Perhaps it's just time to
hand over some of the power (or take the Cray approach). When circumstances
change, the world belongs to the flexible -- the viruses.

NATURAL LANGUAGE...AND COMPUTER PARALLELS

One problem I had talking with Russians is that they don't seem to have
enough experience talking to foreigners to talk slowly. I could always un-
derstand people until the conversation got interesting and they started to
speak quickly in excitement. There's a very practical solution: Each per-
son should speak in the other's language. The natural tendency is to do
just the opposite: I speak in mine; you speak in yours. The trouble is
that each speaker knows what he means and expresses himself perfectly, but
the amount that actually gets communicated is very little. When each uses a
foreign language, by contrast, he uses only words he knows -- and the list-
ener, the native user of the language, knows them too, of course. The
level of the conversation is reduced to the thoughts that each party can ex-
press in another language -- but those thoughts actually get through to the
other side.

In fact, this is precisely what we do with computers. We use commands that
are intelligible to the computer -- because we know it doesn't understand
natural language. Meanwhile, it talks to us in user-friendly menus and
prompts and dialogues and help texts that are foreign to it -- but that it/
its programmer knows we'll understand. Each side knows how to translate its
most important thoughts into the other's language -- but could never under-
stand the full range of the other's thoughts/processes in the other's lan-
guage. (Of course, if either side assumes it understands more than it does,
you still have problems.)
Artificial intelligence and context

Along those same lines, a person encountering a foreign society has some notion of the problems of simulating natural language or nonbrittle AI. I'm smart and logical and I know the language (some), but as far as Russian society goes I don't have the real-world knowledge or context that I need. How are things done? Why are there three lines in the stores? The language is only part of it; you need to know the situations in which it applies. Is it rude if someone uses the familiar form of "you"? If the woman in the next shower stall tells you to use more soap? If someone shows up half an hour late? What are the social implications of going to a restaurant or sharing an ice cream? Why do parents send their kids to the country? Why no bicycles in Moscow? (Pollution, harsh winters, and a fine alternative with the metro.) Is it permissible to phone someone after 10 pm?

There are things they never bother to never tell you -- like where do you pay on the trolley car? The subway is simple; you put 5 kopeks into the turnstile -- not that there's a sign anywhere, but the change machines marked 10, 15 and 20 give you the appropriate number of 5-kopek pieces. These are the kinds of details people always forget to render explicitly in expert systems -- and without which it's impossible to function properly.

Then there is knowledge more along the lines of the patterns a neural net recognizes than the explicit rules that control an expert system. And it operates on all senses. For example, there's a certain taste I can't describe, a sort of marinade associated with cabbage and other cold vegetables. I'd never encountered it before and at first I didn't mind it. But it's now clearly imprinted on my synapses and I hate it. I've been sensitized to it forever, and whenever I encountered it I gagged.

Borrowed identity

Another interesting thing is the role of the translator. People have told me translating can drive you crazy. What was difficult was the division of loyalties: If I was translating the questions of a Russian who was testy, should I be testy, representing him properly? Or should I soften the questions or reword them or even respond to them myself? The translator's code says, I believe, that you should properly represent the person whose words you are translating, but that can annoy your friends.

And finally, who are the people you meet when you have no context to place them in? Is this guy really smart, or is he just normal around here? Is this person's political discussion group really the second most important after the Moscow Tribune or is he dreaming? Are people happy if they think they are? Or if they never think about it? And finally, who are you when no one knows who you are?
PSYCHOLOGY IN RUSSIA: AT LONG LAST FREUD

Psychology has not been a favorite topic of the Soviet government, but it turned up here and there on our trip, enriched by the presence of Sherry Turkle. Her book "The Second Self" is too rich to have a single thesis, but one is that computers, contrary to some popular opinion, are far from dehumanizing. For those who are shy or socially inept, computers may provide a common interest with other people and entry into a social circle. For children who are small or otherwise feel inadequate, mastery of computers may provide a feeling of competence they have never experienced before.

All this holds true in the Soviet Union, but there's more. Even as adults, many Soviet citizens (and certainly some Americans too!) lack the sense of worth that comes from producing an honest day's work. Showing up at a job is not good enough. (You've heard this one before, no doubt: "We pretend to work, and they pretend to pay us.") Computers provide an economic identity; they are tools which a person may use to accomplish work and to build things...whereas the machines at work are simply a means of spending time or filling a quota; their output is not valued but at best weighed or counted.

Second, computers give us a new way to define ourselves. We differentiate ourselves from animals by our ability to reason and speak; we define ourselves against computers because we are alive and have emotions and moods. People also have goals and intentions, which computers lack. Computers carry out the programs they are given, and have no free will -- and therefore no responsibility. They either work or do not work; they do not have depressions, dangerous thoughts or other antisocial tendencies. On the other hand, if they do not work, they must be "fixed" (or cured). In fact, computers sound a lot like the ideal citizen from the Soviet government perspective....articulating that notion may in fact elucidate its absurdity.

Computers also have a disruptive function in the USSR, Turkle found in some interviews with teachers: They serve to highlight bright children who might better remain unidentified among their peers. For all the fuss that the Soviet media make over Soviet chess heroes and Olympic stars, teachers feel more comfortable when children don't stand out.

In general, you're better off without too much intellect, and certainly without the self-preoccupation that psychology and psychoanalysis would seem to condone. You're either sane and supposed to pull yourself together, or crazy enough (or politically dangerous enough) to be put away. When Turkle asked one of our translators what happens to people who get "seriously depressed," the translator simply did not understand (proving once again that "knowing a language" is a complicated concept).

Preoccupation with the self just doesn't fit with the ideals of communism, nor does the moral relativism that psychology somehow implies. People should be good and act responsibly, rather than blame their parents (or rely on the market to turn their greed to mankind's benefit).

It almost slipped by...

Naturally enough, Freud has been one of the many authors de facto banned in the USSR since the Twenties. You could read him, but no one could publish him. ("Party people don't read anything but Marx...but they don't make it
to the end," says one cynic.) One night, in search of a computer club meeting, we stumbled into the wrong place (the man's office rather than the location of the meeting). As it happened, these were the offices not just of Micro-Contour but of the Contour complex co-operative and of another Contour subsidiary, the cultural programs unit run by Marat Akchurin. Akchurin had just received a proof of the cover of his venture's forthcoming book, "Essays in the Psychology of Sexuality," the first Freud book to be published in the USSR in more than 60 years. We ended up at dinner to celebrate and hear about Akchurin's travails in getting the book published.

Sasha and Marat Akchurin in their co-op office

Books are scarce in the Soviet Union, and people crowd around booksellers just as they crowd around hawkers of food and clothing in the streets. The statement that "works by such and such a writer are available" does not mean that they can be found in a bookstore; it means only that they have been published and sold publicly somewhere, sometime. Akchurin's book, for example, had a print run of 100,000. At a price of 6 rubles (about $10), all official copies had been spoken for by subscribers to various book clubs and none would be sold in stores. The black-market price (a few copies have slipped out) was 70 rubles the last we heard, with photocopies going for 15 rubles.

But back to the story. When the government closed the co-ops out of publishing last winter, Akchurin promptly found an ally in the local Komsomol branch (yes, the Young Communists' League, which has become more lively lately in an effort to attract modern youth). As a government institution, Komsomol had the right to engage in publishing, and Akchurin persuaded it to

Release 1.0 21 May 1989
subcontract with him for the Freud book. A published poet himself, he had the necessary contacts to find a printing house, acquire paper and make the other arrangements necessary. He had personally visited the printing house to persuade the employees (two dozen middle-aged women who were a little dubious about the title, he reported) to take on the job. All was done according to law and with the concurrence of government officials.

But the next week, Shishygin, a high official at the government publishing arm Goskomizdat, suddenly decided that "our young people don't need Freud," and halted shipment of the books from the warehouse. Callers responding to a listing of the forthcoming book in Goskomizdat's own weekly Book Review were told it had been indefinitely postponed. The next week a story appeared in The New York Times (tipped off by me, in an example of Akchurin's ability to win friends and influence people). With luck The New York Times article may make a difference. Western opinion matters greatly to the Soviet government; less so to the Soviet people, who regard Gorbachev with skepticism and the West's enthusiasm with cynicism. (Besides, U.S. papers and magazines are hard to get hold of. I sent Marat a copy of the Times article since he hadn't seen it yet.)

Meanwhile, says Akchurin, the regular Soviet press won't touch the story -- hardly surprising, since most of it is owned by Goskomizdat. (He's still hopeful of coverage in the "alternative weekly" Moscow News.) An Izvestia reporter had an article on this sorry affair canceled by his boss, while a television show lost interest once they found out that a co-operative was involved. As of last week, Akchurin said, Goskomizdat planned to distribute the publication itself, mostly to high officials, and has started returning money to the original would-be purchasers. There the matter rests so far as I know.

THE END OF THE WORLD

The day before I left was Easter, which is celebrated the night before with candlelight singing processions through the churches. In years past, my friends told me, the government would make sure to broadcast some especially enticing movie that night to keep people at home, but this year they didn't bother. I ended up staying at home anyway, to go to sleep, and that night, my last but one, I had a dream:

It was the end of the world, and the sun was setting for the last time. It was big and red, casting a golden glow on the buildings (shades of the tsars' palaces I had seen the weekend before in Leningrad) and making beams and shadows in the empty windows. Most of the people were gone -- disappeared, not lying around dead, but simply gone. Those who were left were walking around in friendly cooperation, bringing candles to those who had none, to use against the coming darkness. The end of the world wasn't wild or frantic; it was more peaceful and resigned. Or perhaps the world had already ended and we were the survivors. The sun was about to sink into the sea, and it would soon get very cold.
One of the smartest things I luckily did was to bring along some good books. For starters, they were books I'd been meaning to read for years. Second, when finished, they made far better presents than, say, Jacqueline Susann. And finally, they enriched the trip unexpectedly. The books made me think in new ways, and the trip itself gave me new things to think about. For example, if you've been eating apples all your life, and you encounter an orange, you will learn not only about oranges, but also about fruit. And if you are reading the right books, you might even catch some biology or evolution theory as well.

For further reading

Here are the books I took:

"The Second Self: Computers and the Human Spirit," by Sherry Turkle, Simon & Schuster, 1985. ....and of course it helped to have the real Sherry Turkle along. This book is not just about computers, but about people, and minds, and how computers redefine how we think about ourselves.

"Infinite in All Directions," by Freeman Dyson, Harper & Row, 1988. This has a little bit of everything: cosmology, evolution, small and quick is beautiful, how life got started. But its overriding theme is praise of diversity and faith in tinkering and evolution and trial-and-error rather than grand plans. Now I know where I got my negative feelings about large organizations -- whether governments, academic institutions or even companies. For the good to prosper, the bad must perish -- and no one can predict in advance which is which.

"The Tree of Knowledge," by Francisco Varela and Humberto Maturana, New Science Library, 1987. This one I didn't give away because I had so much trouble finding it in the first place! This book is also about evolution and ecology and biological structures; its most interesting arguments concern the role of language in self-definition... If I could explain it here, it wouldn't have taken Messrs. V and M a whole book!

The winter 1988 issue of "Daedalus" on Artificial Intelligence. My favorite article in here is Danny Hillis', on the evolution of language. My favorite quote is from David Waltz: "...words are not...carriers of complete meanings, but are instead more like index terms or cues that a speaker uses to induce a listener to extract shared memories and knowledge. The degree of detail and number of units needed to express the speaker's knowledge and intent and the hearer's understanding are vastly greater than the number of words used to communicate." This explains precisely the difficulty of knowing another culture; it's not enough to know the rules and definitions, but you must also know the context everyone around you shares. Language has syntax and semantics, but for true understanding you also need situation. (See page 31.)

"Chaos," by James Gleick, Viking Penguin, 1987. You can't always predict things even if you know the equations; you just have to run a simulation and see. And if you don't know the equations, well! Maybe there is no way the Soviet Union can reach equilibrium from where it is now....
"The New Wizard War: How the Soviets Steal U.S. High Technology -- and How We Give It Away," by the computer industry's own Robyn Shotwell Metcalfe, Tempus Books of Microsoft Press, 1988. This was one of my reference books, an exhaustive history of trade relations -- official and illegal -- over the years. I was uncomfortable with what I perceived as a fundamental bias against trade with the Soviets; my fundamental bias favors trade, for reasons outlined above, but I found the book tremendously helpful in understanding facts and trends.

"Moscow Spring," by Jane Taubman and William Taubman, Summit Books, 1989. I didn't even begin this until I was on my way home (including a two-hour traffic-beset taxi ride from Kennedy Airport), and it evoked a lot of, "Yup, that's the way it was!" and "Aha! So that's how it is for most people!" This book is essentially extended reportage on the burgeoning intellectual freedoms and continuing material discomfort of the Soviet people. Its internal contradictions and lack of firm conclusions render it credible; in the end, it doesn't attempt to persuade but simply to inform.

"Perestroika 1989," edited by Alexander Yakovlev, Charles Scribner's Sons/Macmillan, 1988. I didn't have this along with me, but it was useful after the fact, with essays by Abel Aganbegayan and Tatyana Zaslavskaya, among others.

"The Information Age and Soviet Society," by Richard W. Judy and Virginia Clough, The Hudson Institute, 1989. Unfortunately I didn't have this with me on the trip; it has just been published. Most of it is included in an extremely thorough, useful series of Hudson Institute papers by Judy and Clough and Robert Clough under the general title "The Implications of the Information Revolution for Soviet Society," which includes sections on hardware, software and telecommunications.

CREDITS AND CAVEATS

My trip and my description of it are an attempt to understand the reality of some small number of people in the Soviet Union. I visited only one city in depth and talked to only a small group of people, most of them intellectuals. Although I speak enough Russian to engage in interesting conversations with non-English speakers, most of the substantive conversations took place in English, especially during the early part of the trip. (But many were conversations or discussions, not interviews.) I tried to experience what it's like being a Soviet citizen, but I always had the luxury of escaping to a hard-currency shop to buy some tinned milk in extremis. (Even as a hunter-gatherer, I had access to better fields than the natives did.) But best of all was the knowledge that in May I'd be back in the US.

That knowledge was certainly shared by all the people I talked to. How can you thank someone for an "interesting" conversation about his despair? But how can you say "it's horrifying" and walk away? I listened at length to a half-Georgian who had just returned from riot-torn Georgia, and to another man who had helped out after the Armenian earthquake. It's one thing to complain about the inefficiency with which swimming pools are run; what can you say when people die horrible deaths because of government inefficiency and malign neglect?

Release 1.0 21 May 1989
I interviewed no high government officials and collected few facts or statistics. Overall, I consider most of them meaningless, and officials disagree enough among themselves that I'm content to rely on the press for our overviews and trust our own judgements on the reality of living and working day to day within one small community in the Soviet Union. I don't spend much time interviewing government or high corporate officials in the US either. The power structure is inscrutable, the future is unknowable, and the present is in the details people face every day. Too much clarity would be deceiving.

Thanks to

Levon Amdilyan and Sergei Ulin of the International Computer Club
Gary Chapman of Computer Professionals for Social Responsibility, who set it all up and forgave me my rotten temper
Sherry Turkle, who got us invited and shared a lot of wisdom
Boris Shekhtman, the world's best Russian teacher
Jack Rosenthal, who helped me find Boris
The EDventure staff, who kept the home fires burning
All the wonderful people I met

Release 1.1: Codan pricing

We checked our facts, and then we forgot to make the change in our April issue: Codan, from Implements, (617) 358-5858, costs $395, not $198.
(All phone numbers are for Moscow unless otherwise specified. A telecommunications engineer I met told me that there are only 33 international circuits, so trying to get through may be tedious. Addresses and information on other people and other assistance cheerfully supplied on request.)

Arkady Borkowsky, 201-35-14  
Alexei Pazhitnov, 291-35-62  
Bruce Marquardt, Ashton-Tate, London, (44 753) 27262  
Marat Akchurin, Contour, 200-15-51  
Semyon Briskin, Contour, 209-16-36 or 200-27-79  
Gary Chapman, CPSR, Palo Alto, (415) 322-3778 (617) 232-9788  
Boris Serebro, Ilya Karas, Eleks, 288-95-52  
Ustus Agur, Estonian Institute for Scientific and Technical Information, Tallinn, 44.05.13  
Lee Felsenstein, Golemics/Glav-PC, Berkeley, (415) 548-0738  
Dick Judy, Hudson Institute, Indianapolis, (317) 545-1000  
Mikhail Krasnov, Inforcom, 203-06-14  
Levon Amdilyan, Sergei Ulin, International Computer Club, 921-09-02  
Peter Zrellov, Jack Byers, JV Dialog, 329-43-33, Fax, 329-47-00  
Jack Byers, Management Partnerships International, Chicago, (312) 431-3000  
Steve Ballmer, Microsoft, Redmond, (206) 882-8080  
Vladimir Igritsky, Rekma, 165-74-09 or 233-39-23  
Stepan Pachikov, MicroContour, 200-25-66  
Grigor Pelman, Perspektiva, 276-17-86  
Evgenii Pushchinsky, Terminal, New York, (212) 736-4433 (c/o Information Builders)  
Maxim Khomyakov, Terminal, 457-81-64  
Seymour Goodman, University of Arizona, Tucson, (602) 621-2684  
Igor Manko, Zodiak, 331-21-70

COMING SOON

Back to software...

• ...but with a slightly broader vision, as in commentary on 1992 (a great market for seminars and conferences, at the least).

• A composition engine.

• Ecology of computation.

• Active and passive objects.

• And much more... (If you know of any good examples of the categories listed above, please let us know.)

Release 1.0

22 May 1989

May 29-June 2  Ninth international workshop on expert systems and their applications - Avignon, France. Contact: Jean-Claude Rault, 011 331 4780-7000.


May 31-June 2  *SIGMOD - Portland, OR. User interfaces to dbms systems and some more esoteric management of data topics. Sponsored by ACM/SIGMOD. Keynote: Esther Dyson! Contact John Bruno, (503) 629-8383.

June 5  Toshiba Micro Industry Golf & Tennis Celebrity Tournament - Industry Hills/Los Angeles. With Tom Selleck, others; funds raised go to the Starlight Foundation for terminally ill children. Contact: Dave Freeman, (714) 558-8813.

June 6  Marketing software in the European community - Washington, DC. "What happens in 1992?" Advice and experience from people who have done it. Sponsored by Adapso. Contact: Kelly Bailey, (703) 284-5355. NB -- KPMG Peat Marwick's High Technology practice is also running 14 seminars across the country on this topic, co-sponsored by Adapso and AEA. To find out if there's one near you on a convenient date, call Judy Pierson at (312) 938-5031.

June 5-8  *AIIM show & conference - San Francisco. "Discover the power of imaging." Keynote: astronaut Wally Schirra. Sponsored by the Association for Information and Image Management. Contact: James Breuer, (301) 587-8202.

June 6-7  Profiting from mission-critical systems - Boston. Sponsored by Cahners Publishing, including Datamation and Business Research Group. With John Rockart, Joe Kroger (BiIN), Mel Bergstein (Arthur Andersen), others. Contact: Laura DeMaio, (617) 964-6204.

June 6-8  International expert systems conference and exhibition - London. Sponsored by Learned Information. Contact: Jean Mulligan, (011) 44 865 730275; fax, 865 736354.


June 11-14  *Expert Communication '89 - San Francisco. Sponsored by Graphic Communications Association, co-chaired by Mills Davis and Chris Locke. With John Glippinger, Robert

Release 1.0  21 May 1989
Akscyn, Michael Pliner, Yuri Rubinsky, Esther Dyson. Contact: Norman Scharpf, (703) 841-8160.

**June 12-14**


**June 12-16**

Summer USENIX technical conference - Baltimore. Tutorials on networking, environments, development tools, window systems, etc. Contact USENIX at (213) 592-1381 or 592-3243, or John Donnelly, (303) 499-2600 (exhibits), or Neil Ground Water, (703) 883-1221 (papers).

**June 13**

Effective marketing for a small computer and software services company - Chicago. Sponsored by ADAPSO. Contact: Kelly Bailey, (703) 522-5055.

**June 13-16**

Second international conference on artificial intelligence and law - Vancouver, British Columbia. Sponsored by ACM. Contact Edwina Rissland, (413) 545-0332 or Michael Mills, (212) 554-3180.

**June 15-16**


**June 18-22**

International joint conference on neural networks - Washington, DC. Sponsored by both IEEE and the International Neural Network Society, in an amicable compromise. Patterned after previous events; you'll recognize all the right speakers, including Kosko, Sejnowski, Widrow, Grossberg, Carpenter, Hecht-Nielsen, Amari. Contact Nomi Feldman, (619) 453-6222.

**June 19-21**

Videotex Industry Association annual conference - San Francisco. E-mail, software, services, etc. Call Robert Smith, (703) 522-0883.

**June 18-24**


**June 20-22**

*PC Expo & National CASEcon - New York. Sponsored by PC Expo. Keynote by Dave House of Intel. Call Steven Faher, (800) 444-EXPO or (201) 569-8542. To be followed by....

**June 24**

*Intergalactic user group conference - New York City. For user group officials and other involved people. A follow-on to PC Expo. Call Joe Rigo, (212) 249-6418.

*Release 1.0* 21 May 1989
<table>
<thead>
<tr>
<th>Event Date</th>
<th>Event Name</th>
<th>Location</th>
<th>Organizers</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 21-23</td>
<td>Programming language design and implementation</td>
<td>Portland, OR.</td>
<td>ACM SIGPLAN</td>
<td>Bruce Knobe, (508) 879-2960 x3376 or <a href="mailto:Knobe@S56.Prime.com">Knobe@S56.Prime.com</a></td>
</tr>
<tr>
<td>June 25-28</td>
<td>Twelfth international conference on R&amp;D in information retrieval</td>
<td>Cambridge, MA.</td>
<td>ACM SIGIR and other groups</td>
<td>Bruce Croft, (413) 545-0463</td>
</tr>
<tr>
<td>June 25-28</td>
<td>Exhibition '89</td>
<td>San Jose</td>
<td>Integrated Computer Solutions</td>
<td>Laurie Pelletier at (617) 547-0510</td>
</tr>
<tr>
<td>June 26-28</td>
<td>Twenty-sixth Design Automation Conference</td>
<td>Las Vegas</td>
<td>ACM</td>
<td>Pat Pistilli, (303) 530-4333</td>
</tr>
<tr>
<td>June 26-28</td>
<td>Knowledge engineering today's marketplace</td>
<td>College Park, MD.</td>
<td>John McCarthy, David Bendel Hertz, others. Annual meeting of the International Association of Knowledge Engineers</td>
<td>Joan Scaffidi, (301) 231-7826</td>
</tr>
<tr>
<td>July 17-21</td>
<td>CASE 89</td>
<td>London.</td>
<td>Index Technology and a host of academic groups, including London's Imperial College</td>
<td>Elliot Chikofsky, (617) 494-8200 x 1989</td>
</tr>
<tr>
<td>July 23-25</td>
<td>Sun Expo '89</td>
<td>Santa Clara.</td>
<td>Sun Observer magazine for Sun users and resellers. If there is a hot UNIX box, this is it. Come see for yourself and meet the growing Sun community.</td>
<td>Clayton Peters, (408) 296-7111 or (800) 828-EXPO</td>
</tr>
</tbody>
</table>


August 1-3  Comdex Asia/Pacific - Sydney, Australia. Sponsored by Interface Group. Contact: Cheryl Delgreco, (617) 449-6600.


August 6-9  DB2 Users Group annual meeting - Chicago. Sponsored by International DB2 Users Group. Contact: Samantha Sipowicz, (312) 644-6610.

August 9-10  *Macworld Expo - Boston. Contact: Peggy Kilburn, (617) 326-9955.

August 9-11  *Conference on object-oriented dbms applications - Santa Clara, CA. Sponsored by Santa Clara University. Contact: Mohammed Ketabchi, (408) 554-2731 or mketabchi@scu.bitnet.


August 22-26  *IJCAI-89 - Detroit. The international version of AAAI. Sponsored by the American Association for Artificial Intelligence. Contact: Claudia Mazzetti, (415) 328-3123.

August 23-25  TechDoc '89 - San Jose. "Publishing in the '90s...the art of publishing and the science of information management." Technical documentation and all its ramifications, including hypertext. Sponsored by Graphic Communications Association. Contact: Patti Hill, (703) 841-8160.

August 24-September 1  *Eleventh World Computer Congress - San Francisco. With a focus on tools and application software this year; in the U.S. for the first time in 24 years. Sponsored by 46 IFIP member societies. Call Nancy Dana, (303) 696-6100.

Release 1.0  21 May 1989
<table>
<thead>
<tr>
<th>Date Range</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 6-9</td>
<td>Breakaway '89 - Orlando. Sponsored by ABCD, the micro-computer industry association (mostly dealers). Contact: Deborah Keating, (312) 240-1818.</td>
</tr>
<tr>
<td>September 7-10</td>
<td>Comtec '89 - Singapore. Regional micro exhibition. Sponsored by Microcomputer Trade Association of Singapore. Contact: Yong Mee Hiong, Singapore 2913238; fax 2965384.</td>
</tr>
<tr>
<td>September 11-14</td>
<td>NetWorld - Dallas. Managed by H.A. Bruno. Contact: Adam Torres at (201) 569-8542 or (800) 444-EXPO.</td>
</tr>
<tr>
<td>September 13-15</td>
<td>Conference on Computer-Supported Cooperative Work - London (Gatwick). Inspired by the successful U.S. events, but likely to focus even more on social issues. Sponsorship unclear, but we’re trying to find out! Contact: Lorna Meek, 011 44 (753) 73232.</td>
</tr>
<tr>
<td>September 17-21</td>
<td>Managing the corporate personality for the nineties - Martha’s Vineyard. Sponsored by Design Management Institute. With speakers from Xerox and Danish State Railways, among others. A broadening, useful conference. Call Nancy Barry, (617) 236-4165.</td>
</tr>
<tr>
<td>September 18-20</td>
<td>DataStorage - San Jose. Sponsored by DISK/TREND and Freeman Associates. Call Darlene Plamondon, (408) 554-6644.</td>
</tr>
<tr>
<td>September 20-23</td>
<td>*Seybold computer publishing conference - San Francisco. Sponsored by Seybold Publications. The usual extravaganza, expanded from desktop publishing to include all electronic publishing. Contact: Kevin Howard, (213) 457-5850.</td>
</tr>
</tbody>
</table>
October 1-4  *ADAPSO Management Conference - Orlando. Mingle with your peers (and Disneyworld's nearby just in case). Contact: Sheila Wakefield, (703) 522-5055.

October 2-6  *OOPSLA - New Orleans. Sponsored by ACM/SIGPLAN. Come meet your fellow objects and share procedures. Send a message to Carole Mann, (407) 628-3602.

October 2-6  CD-ROM Expo - Washington, DC. Sponsored by IDG Conference Group. Contact: Mitch Hall, (617) 329-8090.

October 2-6  Interop 89 - San Jose. Interoperability made tangible, with tutorials, discussions, product demos and pitches. Sponsored by Advanced Computing Environments. Contact: Mark Belinsky, (415) 941-3399.

October 3-5  PC Expo - Chicago. Sponsored by PC Expo. Contact: Steven Faher, (800) 444-EXPO or (201) 569-8542.


November 5-10  *Hypertext '89/SIGDOC 89 - Pittsburgh, PA. Much larger, for better or worse, than the first, wonderful hypertext conference in the fall of '87. Hypertext covers the first three days; SIGDOC the last three. Sponsored by ACM. Contact: Elise Yoder at (412) 327-8181 for Hypertext '89; Mike Dolhi or Adam Young at Scribe Systems, (412) 281-5959 for SIGDOC 89. (How about a joint committee on standards for the use of apostrophes?)

November 13-17  *Comdex - Las Vegas. Also including MACdex. Contact: Jane Wemyss at (617) 449-6600 or (800) 325-3330.

December 4-6  *First International conference on object-oriented and deductive databases - Kyoto. Sponsored by IEEE, MCC, many others. Contact: Professor Kiyoshi Agusa, 011 81 75 256-1677 or Won Kim at MCC, (512) 338-3439.

1990


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on the birth of Gabrielle on May nineteenth!
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Daphne Kis
Associate Publisher